



NOTICE:

The information contained on the following page(s) was produced prior to May 1, 2014. On that date Reznor became part of Nortek, Inc.

References to any other company affiliations are no longer valid.

This manual refers to Reznor brand products that have been discontinued for more than 10 years. Some replacement parts may no longer be available from our suppliers. Compatible parts may be substituted.

Please contact your Reznor Representative with specific questions.



CXL, CXLB NOT CGA APPROVED



Models XL, XLB, CXL, CXLB Gas Fired Unit Heaters

INSTALLATION FORM 402-XL-14
OBSOLETES FORM 402-XL-13

REZNOR

 MERCER, PA. 16137

APPLIES TO: Installation • Operation • Service

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FOR YOUR SAFETY

If you smell gas:

- 1. Open windows.**
- 2. Don't touch electrical switches.**
- 3. Extinguish any open flame.**
- 4. Immediately call your gas supplier.**

FOR YOUR SAFETY

The use and storage of gasoline or other flammable vapors and liquids in open containers in the vicinity of this appliance is hazardous.

INSTALLATION CODES AND PROCEDURES

WARNING: Gas-fired appliances are not designed for use in hazardous atmospheres containing flammable vapors or combustible dust, or atmospheres containing chlorinated or halogenated hydrocarbons. See Hazard Levels Page 3.

The instructions contained in this manual apply to the following types of gas for which American Gas Association and Canadian Gas Association design certification has been obtained: Natural and Propane Gas. The type of gas for which your heater is equipped and correct firing rate are shown on the rating plate. Electrical characteristics are shown on the motor name plate and on the unit rating plate.

The unit shall be installed in accordance with the standards of the National Fire Protection Association or the National Fuel Gas Code for gas-fired unit heaters and duct furnaces, and these standards should be followed carefully. Authorities having jurisdiction should be followed carefully. Authorities having jurisdiction should be consulted before installations are made to verify local codes and installation procedures. In the absence of such codes and procedures, the unit shall be installed in accordance with the National Fuel Gas Code ANSI Z223.1-1984. In Canada, the installation of these appliances is to be in accordance with CANI-B149.1 and B149.2, Installation Code for Gas Burning Appliances and Equipment and/or local codes.

Installation in aircraft hangars should be made in accordance with ANSI/NFPA No. 409-1985, Standard for Aircraft Hangars, and in public garages in accordance with NFPA No. 88A-1985, Standard for Parking Structures, and NFPA No. 88B-1985 for repair garages. In Canada, installation in aircraft hangars should be in accordance with the requirements of the enforcing authorities and in public garages in accordance with CANI-B149 codes.

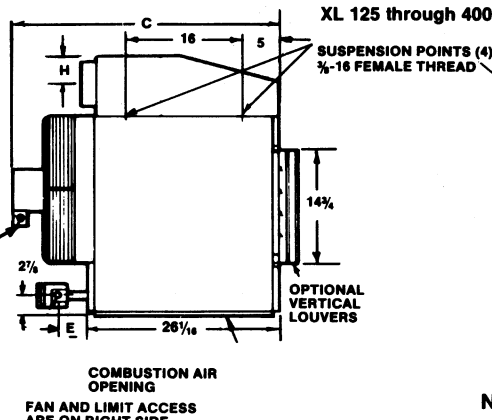
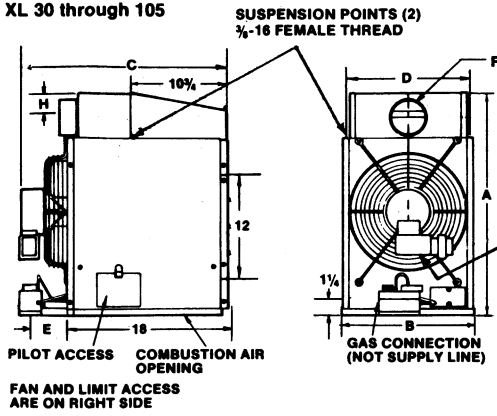
ANSI/NFPA-409-1985 specifies a clearance of 10 feet to the bottom of the heater from the highest surface of the top of the wings or engine enclosures, or whatever aircraft would be the highest to be housed in the hangar, and a minimum clearance of 8 feet from the floor in other sections of aircraft hangars, such as offices and shops which communicate with areas used for servicing or storage. The heaters must be located so as to be protected from damage by aircraft or other objects such as cranes and movable scaffolding. In addition, the heaters must be located so as to be accessible for servicing, adjustment, etc.

NFPA-88-1985 specifies overhead heaters must be installed at least 8 feet above the floor. Clearances to combustible construction or material in storage from the heater and vent must conform with the National Fuel Gas Code ANSI Z223.1-1984 pertaining to gas-burning devices, and such material must not attain a temperature over 160°F. by continued operation of the heater.

DIMENSIONAL DATA

Gas-Fired Propeller & Blower Unit Heaters

XL 30 through 105



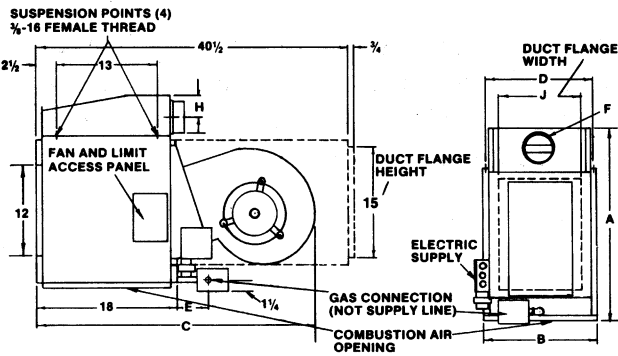
NOTE: DOUBLE FANS ON MODELS 300, 350, 400

DIMENSIONS (Accurate Within Plus or Minus 1/8")

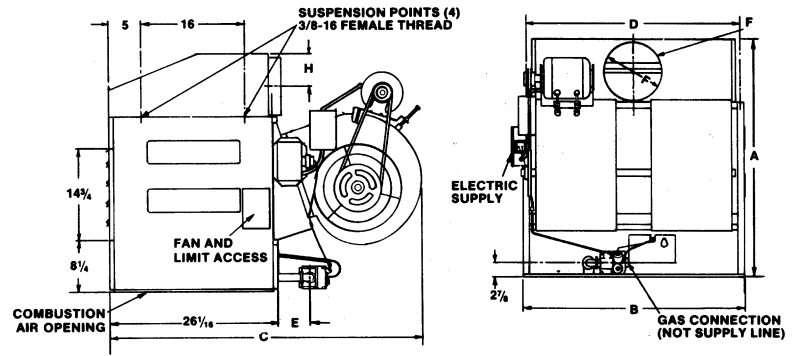
MODEL + XL	A	B	C	D HANGER ϕ	E	F FLUE SIZE	G GAS CONNECTIONS	H	APPROX. NET WT. LBS.
-30	25	11-15/16	22-7/8	11-1/8	4	4" Rd.	1/2" N-P	2-5/8	54
-45	25	14-11/16	23-7/8	13-7/8	4	4" Rd.	1/2" N-P	2-5/8	58
-45 CGA	25	14-11/16	23-7/8	13-7/8	4	4" Rd.	1/2" N-P	2-5/8	65
-60	25	14-11/16	23-7/8	13-7/8	4	4" Rd.	1/2" N-P	2-5/8	65
-75	25	17-7/16	23-7/8	16-5/8	4	5" Ov.	1/2" N-P	2-5/8	85
-105	25	22-15/16	25-1/8	22-1/8	4	6" Ov.	1/2" N-P	2-5/8	105
-125	34-3/4	17-9/16	34-13/16	16-5/16	4-3/4	+ 7" Ov.	1/2" N-P	3-5/8	142
-140	34-3/4	20-5/16	36	19-1/16	4-3/4	8" Ov.	1/2" N-P	3-5/8	148
-150 CGA	34-3/4	20-5/16	36	19-1/16	4-3/4	7" Ov.	1/2" N-P	3-5/8	162
-170	34-3/4	23-1/16	36-13/16	21-13/16	4-3/4	8" Ov.	1/2" N-P	3-5/8	162
-200	34-3/4	25-13/16	36-13/16	24-9/16	4-3/4	8" Ov.	1/2" N-P	3-5/8	176
-225	36-3/4	28-9/16	36-13/16	27-5/16	4-3/4	8" Rd.	1/2" N-P	5	200
-250	36-3/4	34-1/16	34-13/16	32-13/16	4-7/8	8" Rd.	1/2" N-P	5	218
-300	36-3/4	39-9/16	36-13/16	38-5/16	4-7/8	9" Rd.	3/4"N-1/2"-P	5	260
-350	36-3/4	45-1/16	36-13/16	43-13/16	4-7/8	10" Ov.	3/4"N-1/2"-P	5	300
-400	36-3/4	45-1/16	36-13/16	43-13/16	4-7/8	10" Ov.	3/4"N-1/2"-P	5	353

+ NOTE: AGA MODELS MAY HAVE PREFIX "C" TO INDICATE HIGH EFFICIENCY MODEL AND FLUE SIZE CHANGE AS SHOWN.

XLB30 through 105



XLB 125 through 400



NOTE: SINGLE BLOWER ON MODELS 30 THRU 250

DIMENSIONS (Accurate Within Plus or Minus 1/8")

MODEL + XLB	A	B	C	D Hanger ϕ	E	F FLUE SIZE	G GAS CONN.	H	J DUCT CONN.	APPROX. NET WT. LBS.	
										W.O. Cab.	W. Cab.
-30	25	11-15/16	36-1/8	11-1/8	4	4" Rd.	1/2" N-P	2-5/8	8-1/4	81	94
-45	25	14-11/16	36-1/8	13-7/8	4	4" Rd.	1/2" N-P	2-5/8	11	90	104
-60	25	17-7/16	36-1/8	16-5/8	4	5" Ov.	1/2" N-P	2-5/8	13-3/4	95	110
-75	25	22-15/16	36-1/8	22-1/8	4	6" Ov.	1/2" N-P	2-5/8	19-1/4	122	138
-125	34-3/4	17-9/16	45-3/4	16-5/16	4-3/4	+ 7" Ov.	1/2" N-P	3-5/8	N/A	176	
-140	34-3/4	20-5/16	48-3/8	19-1/16	4-3/4	7" Ov.	8" Ov.	1/2" N-P	3-5/8	N/A	180
-170	34-3/4	23-1/16	48-3/8	21-13/16	4-3/4	8" Ov.	1/2" N-P	3-5/8	N/A	208	
-200	36-3/4	25-13/16	48-3/8	24-9/16	4-3/4	8" Rd.	1/2" N-P	5	N/A	230	
-225	36-3/4	28-9/16	48-3/8	27-5/16	4-3/4	8" Rd.	1/2" N-P	5	N/A	252	
-250	36-3/4	34-1/16	48-3/8	32-13/16	4-7/8	9" Rd.	3/4"-N 1/2"-P	5	N/A	312	
-300	36-3/4	39-9/16	48-3/8	38-5/16	4-7/8	10" Ov.	3/4"-N 1/2"-P	5	N/A	385	
-400	36-3/4	45-1/16	48-3/8	43-13/16	4-7/8	10" Ov.	3/4"-N 1/2"-P	5	N/A	452	

◆ XLB Models Not Approved in Canada.

+ NOTE: AGA MODELS MAY HAVE PREFIX "C" TO INDICATE HIGH EFFICIENCY MODEL AND FLUE SIZE CHANGE AS SHOWN.

WARRANTY: Warranty is void if . . .

- a. Model XL, XLB, CXL, CXLB unit heaters are used in atmospheres containing flammable vapors or atmospheres containing chlorinated or halogenated hydrocarbons.
- b. Wiring is not in accordance with diagram furnished with the heater.
- c. Unit is installed without proper clearance to combustible materials or located in a confined space without proper ventilation and air for combustion. (See Para. 3-4).
- d. XL, CXL fan-type unit heater is connected to a duct system.

HAZARD INTENSITY LEVELS

- 1. **Danger:** Failure to comply will result in severe personal injury or death.
- 2. **Warning:** Failure to comply could result in severe personal injury or death.
- 3. **Caution:** Failure to comply could result in minor personal injury or property damage.

1. UNCRATING

The gas heater is shipped completely assembled. Immediately upon uncrating the unit, check the gas specifications and electric characteristics of the unit to be sure that the gas supply and electric supply at the job is suitable for the unit.

Check the unit for any damage that may have been incurred in shipment, and if any damage is found, file a claim with the transporting agency. This unit has been gas fired and inspected at the factory immediately prior to crating and was in perfect condition at that time.

On Models XL, XLB, CXL, CXLB 300, 350, 400 a shipping angle is attached to unit and crate bottom. Leave crate bottom attached to unit until unit is installed. Remove shipping angles and crate bottom prior to operating unit.

2. UNIT HEATER LOCATION

For best results, the unit should be placed with certain rules in mind. In general, a unit should be located from 8 to 12 feet above the floor. Units should always be arranged to blow toward or along exposed wall surfaces, if possible. Where two or more units are employed in the same room, a general scheme of air circulation should be maintained for best results.

Suspended heaters are most effective when located as close to the working zone as possible, and this fact should be kept in mind when determining the mounting heights to be used. However, care should be exercised to avoid directing the discharged air directly on the room occupants.

Partitions, columns, counters, or other obstructions should be taken into consideration when locating the unit heater. The unit heater should be located so that a minimum quantity of air will be deflected by any such obstacles.

When units are located in the center of the space to be heated, the air should be discharged toward the exposed walls.

In large areas, units should be located to discharged air along exposed walls with extra units provided to discharge air in toward the center of the area.

At those points where infiltration of cold air is excessive, such as at entrance doors and shipping doors, it is desirable to locate the unit so it will discharge directly toward the source of cold air from a distance of 15 to 20 feet. (Units should not be installed closer than 18 inches from any wall.)

3. CLEARANCES AND COMBUSTION AIR

Units must be installed so that the following clearances are provided for combustion air space, service and inspection, and for proper spacing from combustible construction.

3. COMBUSTION AIR (continued)

MODEL	REQUIRED CLEARANCES				
	TOP	FLUE CONNECTOR	SIDES	BOTTOM	REAR
XL, CXL 30-105 XLB, CXLB 30-105	6"	6"	18"	12" ♦	24"★
XL, CXL 125-400 XLB, CXLB 125-400	6"	6"	18"	12" ♦	32"★

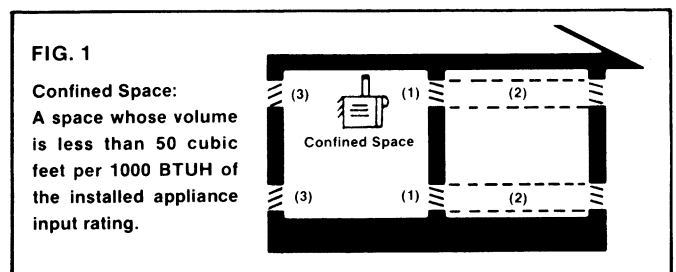
★For servicing purposes only. Front and rear must remain full open.

♦ Except when supplied with optional down-turn nozzle, bottom is 42".

All fuel-burning equipment must be supplied with the air that enters into the combustion process and is then vented to the outdoors. Sufficient air must enter the equipment location to replace that exhausted through the vent system. Modern construction methods involve the greater use of insulation, improved vapor barriers and weatherstripping, with the result that buildings generally are much tighter structurally than they have been in the past. Combustion air supply for gas-fired equipment can be affected by these construction conditions because infiltration that would have existed in the past may not be adequate. Extensive use of exhaust fans aggravates the situation. In the past, the infiltration of outside air assumed in heat loss calculations (one air change per hour) was assumed to be sufficient. However, current construction methods utilizing more insulation and vapor barriers, tighter fitting and gasketed doors and windows or weatherstripping, and mechanical exhaust fans may now require the introduction of outside air through wall openings or ducts.

The requirements for combustion and ventilation air depend upon whether the unit is located in a confined or unconfined space. An "unconfined space" is defined as a space whose volume is not less than 50 cubic feet per 1000 BTUH input of the installed appliance. Under all conditions, enough air must be provided to insure there will not be a negative pressure condition within the equipment room or space. A positive seal must be made in all return-air connections and ducts. Even a "slight" leak can create a negative pressure condition in a confined space and affect combustion.

4. HEATERS LOCATED IN CONFINED SPACES



Do not install unit in confined space without providing wall openings leading to and from this space. Provide adequate openings near floor and ceiling for ventilation and air for combustion, as shown in Fig. 1 depending on combustion air source as noted below.

Add total BTUH of all appliances in the confined space and divide by figures below for square inch free area size of each (top and bottom) opening.

- 1. **Air from inside building** — openings 1 square inch free area per 1000 BTUH. Never less than 100 square inches free area for each opening. See (1) in Figure 1 above.
- 2. **Air from outside through duct** — openings 1 square inch free area per 2000 BTUH. See (2) in Figure 1 above.
- 3. **Air direct from outside** — openings 1 square inch free area per 4000 BTUH. See (3) in Figure 1 above.

NOTE: For further detail on supplying combustion air to confined space see: National Fuel Gas Code ANSI Z223.1-1984 5.3.3.

5. SUSPENDING THE UNIT

Before suspending the unit, check the supporting structure to be used to determine whether it has sufficient load-carrying capacity to support the weight of the unit. Net weight of each type and size unit is noted on the dimensional tables on page 2.

The units are designed to be hung from the supporting structure with 3/8-16 threaded sockets for rod attachment. Models 30-105 are provided with three sockets on each side as indicated on the dimensional drawings. XL, CXL fan Models 30-105 may be hung from the center balance point socket only. XLB, CXLB blower Models 30-105 must be hung from the four sockets provided as indicated on the dimensional drawings. The rear support rods carry the unit weight and the front rods provide balance to support the over-hanging blower/motor weight. See Fig. 2.

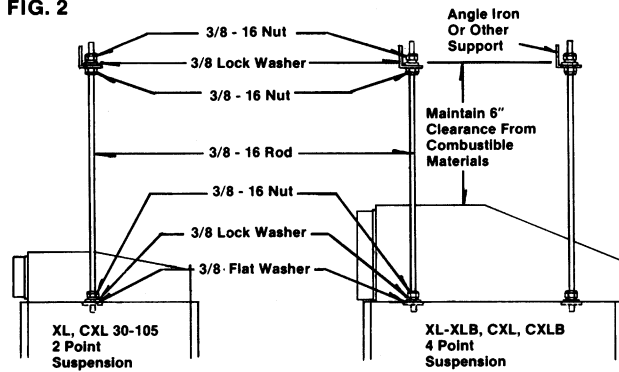
Sizes 125 through 400 are provided with two sockets per side and require four support rods as standardly equipped. As mentioned above, the XLB, CXLB Models 125-400 must use four-point suspension to balance blower/motor weight.

Optional kits are available for fan-type units to provide two-point balanced suspension from pipe supports by adding swivel couplings-inch pipe. Four-point kits are available for blower-type units. See following kit descriptions.

WARNING: Units must be supported in a level altitude for proper operation. Do not place or add additional weight to the suspended unit. See Hazard Levels page 3.

TYPICAL THREADED ROD SUSPENSION

FIG. 2

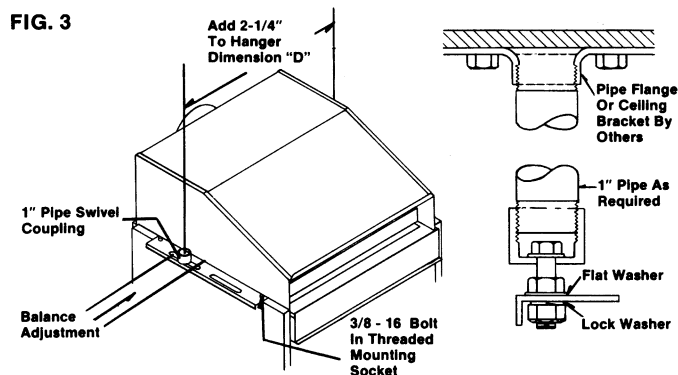


6. PIPE HANGER KIT, OPTION CK2

Provides two-point swivel coupling, balanced suspension for XL, CXL sizes 125-400. Kit includes two adapter brackets, four attachment bolts, two 1" pipe swivel couplings, mounting bolts, washers, and locknuts. See Fig. 3.

Installation: 1. Install brackets as in sketch with 3/8 bolts and lock-washers. Install pipe couplings in rear slots as in sketch, making sure swivel coupling has clearance to move freely. 2. Hang unit using 1" pipe of suitable length. 3. Adjust pipe couplings in slot until unit hangs level each direction. Tighten bolts securely. **Note:** Using adapter brackets adds 2-1/4" to each model's hanger spacing dimension.

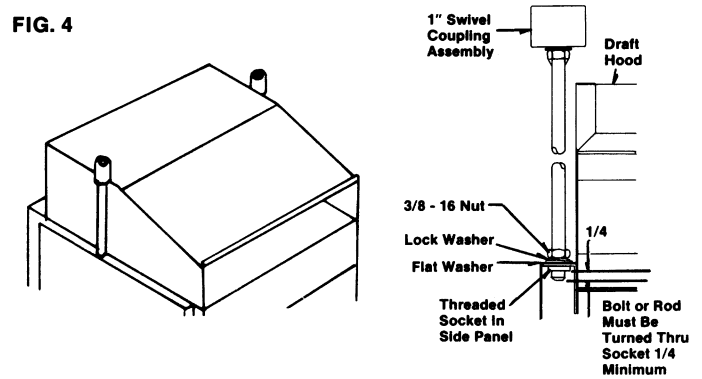
FIG. 3



6A. PIPE HANGER KIT, OPTION CK1

Provides two-point swivel coupling suspension for XL, CXL sizes 30-105. Kit includes two 1" pipe couplings and two 3/8-16x6" long threaded rods and attachment hardware to extend swivel coupling above draft diverter. Hanger centerline distance remains as indicated on dimensional drawing. See Fig. 4.

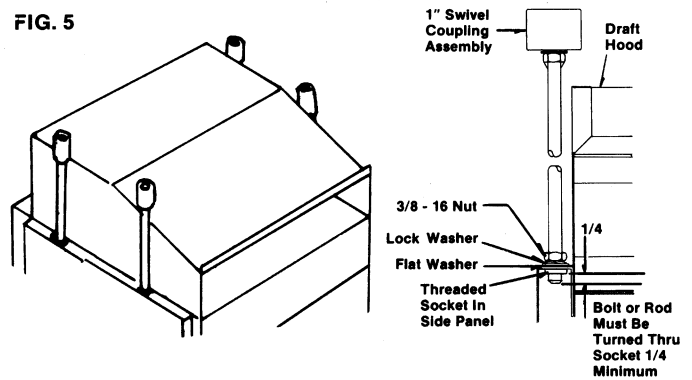
FIG. 4



6B. PIPE HANGER KIT, OPTION CK6

Provides four-point swivel coupling suspension for XLB, CXLB sizes 125-400. Kit includes four 1" pipe couplings and four 3/8-16 x 12" long threaded rods and attachment hardware to extend swivel coupling above draft diverter. Hanger centerline distance remains as indicated on dimensional drawing. See Fig. 5.

FIG. 5



6C. PIPE HANGER KIT, OPTION CK3

Provides four-point swivel coupling suspension for XLB, CXLB sizes 30-105. Kit includes four 1" pipe couplings and four 3/8-16 x 6" long threaded rods and attachment hardware to extend swivel couplings above draft diverter. Hanger centerline remains as indicated on dimensional drawing. See Fig. 5

7. BLOWER SPEED ADJUSTMENT XLB, CXLB 125-400

Motors are equipped with adjustable pulleys which permit adjustment of blower speed. After removing the belt, loosen the set screw on the side of the pulley away from the motor. Then turn adjustable half of the pulley inward to increase blower speed and decrease temperature or outward to decrease speed and increase temperature. One turn of the pulley will change speed 8% to 10%. After setting the pulley, tighten the set screw on the flat portion of the pulley shaft. Replace the belt and adjust belt tension. Proper belt tension is important to the long life of the belt and motor. A loose belt will cause wear and slippage. Too much tension will cause excessive motor and blower bearing wear. Adjust belt tension by means of the adjusting screw on the motor base until the belt can be depressed 1/2 inch to 3/4 inch. Tighten lock nut on adjusting screw.

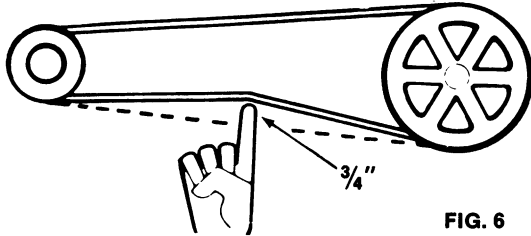


FIG. 6

XLB, CXLB units are free air delivery units and are pre-set at the factory to operate at the high air delivery and are limited to a maximum static resistance of 0.20 inch W.C. Normally, there should be no need for adjusting blower speed on free delivery units.

XLB, CXLB units with duct work — if the duct resistance is low, the blower may deliver too high an air volume, requiring a reduction in blower speed. If the unit is operated before the duct is installed, it may deliver sufficient excess air to overload the motor causing the built-in overload protector to cycle the motor. Reducing blower speed will correct this condition. Blower speed should be returned to normal after duct work is in. If the duct resistance is at or near the maximum allowable 0.20 inch water column, **it may be necessary to increase the blower speed to get the required air delivery.**

Check outlet air temperature with thermometer and set motor pulley to give desired rise (60° F to 90° F for XLB 125 thru 400, 45° F to 75° F for CXLB 140 thru 250 and 70° F to 100° F. For CXLB 300 thru 400). (An outlet temperature of 130°-150° is normal). Check current draw with ammeter at disconnect switch terminals and compare with motor rating plate ampere rating.

CAUTION: An external duct system static pressure **not within limits shown on rating plate**, or improper motor pulley or belt adjustment, may overload motor.

7A. BLOWER SPEED ADJUSTMENT XLB, CXLB 30-105 — DIRECT DRIVE Motors are factory wired for high speed and may be changed to low speed by re-wiring the motor using the color-coded wires as listed below.

Model	Low Speed	High Speed
30	Red & White	Blue & White
45	Red & White	Blue & White
60	Blue & White	Black & White
75	Red & White	Blue & White
105	Blue & White	Black & White

CAUTION: Do not re-wire to any color wires other than those listed for each individual model size. See Hazard Levels page 3.

8. DUCT CONNECTIONS (XLB, CXLB BLOWER MODELS ONLY)

Propeller fan type unit heaters are not designed for installation with discharge ducts. Static pressures created by such ducts can cause serious overheating, venting, or pilot and burner ignition problems.

Proper size duct work based on CFM and available pressure is a must for a good heating installation.

All warm air supply ducts should be equipped with dampers so that the system may be properly balanced.

Calculated heat loss is a pre-requisite to determining duct designs for any good warm air heating system. It is recommended that a simplified method for heat loss calculation, sponsored by a reputable organization, be followed. The recognized authority for such information is the Air Conditioning Contractors Association, 1228 17th St. N.W. Washington, D.C. 20036. A manual covering duct sizing in detail may be purchased from them.

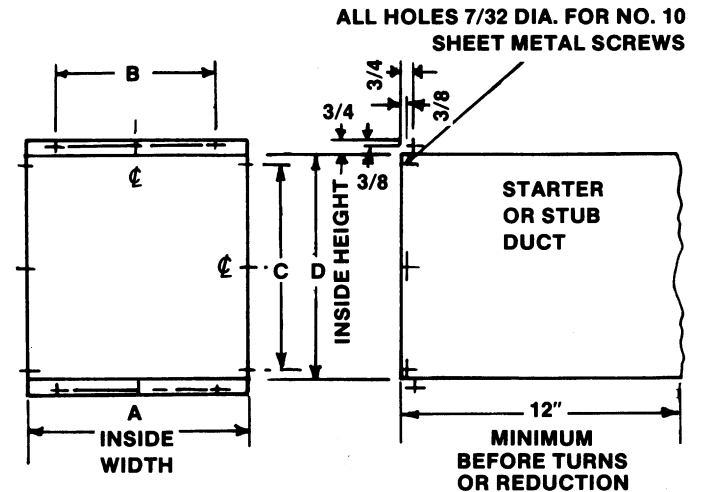
NOTE: Models XLB, CXLB are limited to a maximum static resistance of 0.20 inch water column. Therefore the duct system should be sized to deliver the desired air quantity to the space being served without exceeding 0.20 inch friction loss. The installation is to be adjusted to obtain a temperature rise within the range specified on the unit heater rating plate.

8A. DUCT CONNECTION PROCEDURE MODELS XLB, CXLB

Units are shipped with horizontal louver assembly. To connect to duct work, remove the louver assembly and fabricate a starter or stub duct as shown in Figure 7. The duct is fitted over the vertical flange of the unit and fastened to the top and bottom front panels and side flange with sheet metal screws. Seal joints with duct tape to prevent air leaks from interfering with draft diverter operation.

DUCT FABRICATION — XLB, CXLB

FIG. 7



MODEL	A	B	C	D
CXLB, XLB 30	10 ⁵ / ₈	8 ¹ / ₄	9 ⁵ / ₈	12 ⁵ / ₈
CXLB, XLB 45	10 ⁵ / ₈	8 ¹ / ₄	9 ⁵ / ₈	12 ⁵ / ₈
CXLB, XLB 60	13 ⁷ / ₁₆	11	9 ⁵ / ₈	12 ⁵ / ₈
CXLB, XLB 75	16 ¹ / ₈	11	9 ⁵ / ₈	12 ⁵ / ₈
CXLB, XLB 105	21 ⁵ / ₈	11	9 ⁵ / ₈	12 ⁵ / ₈
XLB 125	15 ⁵ / ₈	14 ¹ / ₈	14	15 ¹ / ₄
CXLB, XLB 140	15 ⁵ / ₈	14 ¹ / ₈	14	15 ¹ / ₄
CXLB, XLB 170	18 ³ / ₈	14 ¹ / ₈	14	15 ¹ / ₄
CXLB, XLB 200	21 ¹ / ₈	14 ¹ / ₈	14	15 ¹ / ₄
CXLB, XLB 225	23 ⁷ / ₈	14 ¹ / ₈	14	15 ¹ / ₄
CXLB, XLB 250	26 ⁵ / ₈	14 ¹ / ₈	14	15 ¹ / ₄
CXLB, XLB 300	32 ¹ / ₈	28 ¹ / ₄	14	15 ¹ / ₄
CXLB, XLB 350	37 ⁵ / ₈	28 ¹ / ₄	14	15 ¹ / ₄
CXLB, XLB 400	43 ¹ / ₈	28 ¹ / ₄	14	15 ¹ / ₄

TO ASSEMBLE TO HEATER

1. Remove sheet metal screws from the top of the bottom front panel.
2. Remove louver assembly.
3. Assemble duct to heater and replace screws in the bottom front panel.
4. Drill 7/32" diameter holes at top and sides of duct.
5. Secure with No. 10 sheet metal screws.

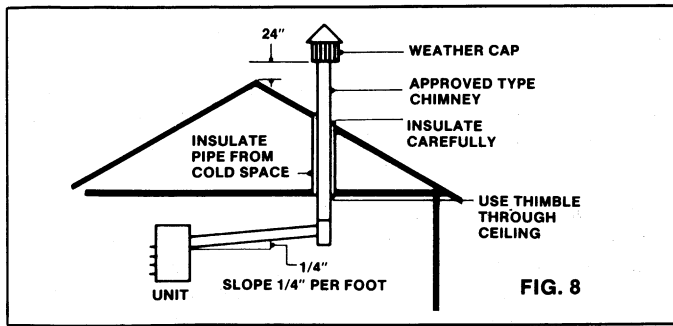


FIG. 8

9. VENTING

WARNING: Failure to provide proper venting could result in death, serious injury, and/or property damage. Unit must be installed with a flue connection and proper vent to the outside of the building. Follow installation codes listed on Page 1 and venting recommendations that follow. Safe operation of any gravity vented gas equipment requires a properly operating vent system, correct provision for combustion air (See Paragraph 3-4) and regular maintenance and inspection. See Hazard Levels page 3.

The following general recommendations apply to satisfactory venting of the heater.

1. The unit heater is equipped with a built-in draft diverter, consequently an external draft diverter **MUST NOT** be installed in the flue connection or any internal alterations made.
2. The effective area of the gas vent when connected to a single appliance shall not be less than the area of the appliance draft hood outlet or in accordance with approved venting methods. The effective area of the gas vent when connected to more than one appliance shall not be less than the area of the largest vent connector plus 50% of the areas of additional vent connectors or in accordance with approved venting methods.
3. Horizontal flue pipe should have a uniform rise of 1/4 inch per foot of horizontal run in the direction of discharge.
4. Flue pipe should be minimum of No. 20 gauge galvanized steel or other non-corrosive material. Where it is necessary to run the flue pipe through a wall or any combustible material, an approved thimble should be used. The flue pipe shall be so located that combustible materials are at least 6 inches away. Double wall vent pipe is recommended.
5. The flue connection should be made into a permanent chimney or through a roof vent of approved design. The roof vent should extend at least 2 feet above any obstruction within 10 feet of the outlet.
6. No manual damper or other fixed restriction shall be installed in the vent connection.
7. If the unit heater is installed in a space served by a large exhaust fan, be sure that the exhaust fan does not affect the operation of the heater or the satisfactory venting of its products of combustion. If a negative pressure exists, as evidenced by a downdraft, a mechanical motor driven "Venter" (Optional Equipment) should be installed. In severe negative pressure conditions, make-up air equipment may be necessary.
8. Where it is necessary to use a long run of vent pipe, or where the vent pipe is exposed to cold air, condensation within the flue may occur. There are two ways to overcome this problem: (1) Prevent condensation by insulating the pipe so that the temperature of the flue products never drop below 250°F. and, (2) Provide a trap for collecting the condensate before it can enter the heater. Type B vent such as Metalbestos or Amerivent is also recommended.
9. A suitable weather cap should be installed on the end of the flue pipe to prevent rain or snow entering the open end of the flue.
10. Provide a minimum clearance of 18" between the draft hood relief opening and any obstruction. Do not expose relief opening to high draft or wind from an overhead door.
11. When using Type B vent pipe maintain or exceed the minimum clearance to combustibles as specified by the pipe manufacturer. Consult your local codes and Z223 National Fuel Gas Code.

10. GAS PIPING AND PRESSURES

CAUTION

The appliance is equipped for a maximum gas supply pressure of 1/2 pound, 8 ounces or 14 inches water column. Note: supply pressures higher than 1/2 pound require installation of an additional service regulator external to the unit.

PIPING SYSTEM PROOF TESTING

The appliance and its individual shutoff valve must be disconnected from the gas supply piping system during any pressure testing of that system at test pressures in excess of 1/2 PSIG (3.45 K Pa).

The appliance must be isolated from the gas supply piping system by closing its individual manual shutoff valve during any pressure testing of the gas supply piping system at test pressures equal to or less than 1/2 PSIG (3.45 K Pa). See Hazard Levels page 3.

All piping must be in accordance with requirements outlined in the pamphlets National Fuel Gas Code ANSI/Z223.1-1984 published by the American Gas Association or CANIB149.1 and B149.2 published by the Canadian Gas Association. Gas supply piping installation should conform with good practice and with local codes.

Pipe joint compounds (pipe dope) shall be resistant to the action of liquefied petroleum gas or any other chemical constituents of the gas being supplied.

Where regulations require and for ease of servicing, install a ground joint union and manual shut-off valve upstream of unit control system, as shown in Fig. 9, page 6. The 1/8 plugged tapping in the shut-off valve provides connection for supply line pressure test gauge. Local codes may require a 6 inch trap at the inlet of controls. (See Fig. 9).

After all connections are made, disconnect pilot supply at control valve and bleed system of all air. Reconnect pilot line and check all connections by brushing on a soap solution.

WARNING: All components of gas supply system must be leak tested prior to placing equipment in service. NEVER TEST FOR LEAKS WITH AN OPEN FLAME. See Hazard Levels page 3.

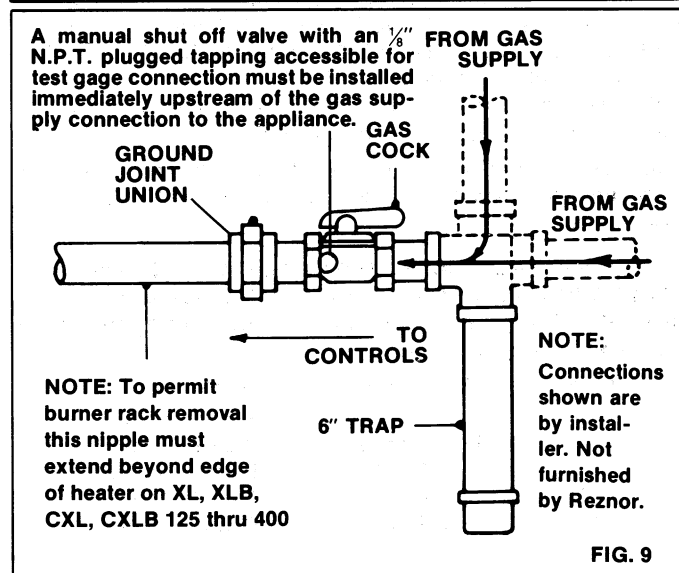


FIG. 9

MANIFOLD OR ORIFICE PRESSURE SETTINGS

For natural gas: Manifold pressure is regulated by the combination valve to 3.5" water column. Line pressure upstream of the controls must be a minimum of 5" water column or as noted on unit rating plate.

For Propane Gas: Manifold pressure is regulated by the combination valve to 10" water column. Line pressure upstream of controls must be 11" water column minimum and 14" maximum.

In both cases, measure the gas pressure with the unit in operation after removing the 1/8" manifold pressure tap plug located in the control valve body and connecting a manometer. Set pressure to above settings by turning regulator screw IN (clockwise) to increase pressure. Turn screw OUT (counterclockwise) to decrease pressure.

11. SIZING GAS SUPPLY LINES

TABLE 1 — Capacity of piping in cubic feet per hour based on 0.3" water column pressure drop and 0.6 specific gravity.

Length Of Pipe	Diameter of Pipe — Inches					
	1/2	3/4	1	1 1/4	1 1/2	2
20 Feet	92	190	350	730	1100	2100
30 Feet	73	152	285	590	890	1650
40 Feet	63	130	245	500	760	1450
50 Feet	56	115	215	440	670	1270
60 Feet	50	105	195	400	610	1105
70 Feet	46	96	180	370	560	1050
90 Feet	40	84	160	320	490	930
100 Feet	38	79	150	305	460	870
125 Feet	34	72	130	275	410	780

TABLE 2 — Conversion table to be used when gases of specific gravity are other than 0.60.

S.G.★	M.★★	S.G.★	M.★★	S.G.★	M.★★	S.G.★	M.★★
.35	1.31	.65	.960	1.00	.780	1.60	.610
.40	1.23	.70	.930	1.10	.740	1.70	.590
.45	1.16	.75	.900	1.20	.710	1.80	.580
.50	1.10	.80	.870	1.30	.680	1.90	.560
.55	1.04	.85	.840	1.40	.660	2.00	.550
.60	1.00	.90	.820	1.50	.630	2.10	.540

★Specific Gravity

★★Multiplier

EXAMPLE: (1) Input of unit - 225,000 BTUH (2) Length of pipe run needed — 40 feet (3) The gas is propane, with a specific gravity of 1.60 and a heating value of 2,500 BTU per cubic foot.

THEN: $\frac{225,000 \text{ BTUH/hr.}}{2,500 \text{ BTU/hr.}} = 90 \text{ Cu. Ft./Hr.}$

From Table 2, 1.60 specific gravity has a multiplier of 0.610. Multiply the gas flow required, 90 cu. ft./hr. by 0.610, giving a corrected gas flow of 54.9 cu. ft./hr. Referring to Table 1, we find that a 40 foot length of 1/2 inch pipe has a capacity of 63 cubic feet per hour, or somewhat over the example requirements.

NOTE: When sizing supply lines, consider possibilities of future expansion and increased heating requirements.

12. ELECTRICAL SUPPLY CONNECTIONS

All electrical wiring and connections including electrical grounding **MUST** be made in accordance with the National Electric Code ANSI/NFPA No. 70-1984 or, in Canada, the Canadian Electrical Code, Part I-C.S.A. Standard C22.1. Check any local ordinance or gas company requirements that apply.

1. Check rating plate on heater for supply voltage and current requirements. A separate line voltage supply with fused disconnect switch should be run directly from main panel to the unit, making connection to leads in junction box. All external wiring must be within approved conduit and have a minimum temperature rise rating of 63°F. See wiring diagram in heater junction box. Conduit from disconnect switch must be run so as to not interfere with service panels of heater. The unit must be electrically grounded in accordance with the National Electrical Code, ANSI/NFPA No. 70-1984 or C.S.A. Standard C22.1 when installed, if an external electrical source is utilized.

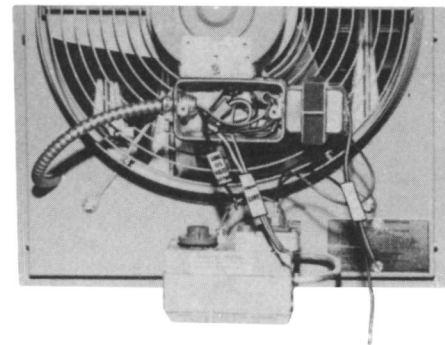
CAUTION: If any of the original wire as supplied with the appliance must be replaced, it must be replaced with wiring material having a temperature rating of at least 105 Degrees C., except for energy cut off or sensor lead wire which must be 150 Degrees C. See Hazard Levels page 3.

2. Install room thermostat in accordance with directions furnished with thermostat. Heater is equipped with low voltage controls (24V). **IMPORTANT:** Make sure that the heat anticipator adjustment in the thermostat matches the total amp load of the 24V control circuit.
3. See separate instruction sheets for any optional equipment provided.

Wiring diagrams and complete instructions are packed with each unit. See typical Wiring Diagram page 8.

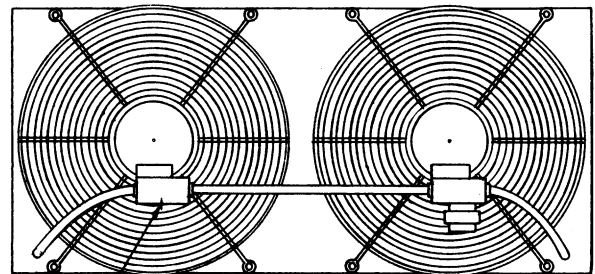
13. LINE CONNECTIONS

MODEL XL, CXL 30-250. SINGLE FAN



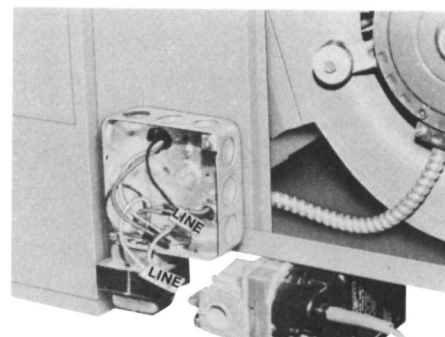
CONNECT POWER SUPPLY TO WIRES MARKED WITH LINE TABS IN OUTLET BOX MOUNTED TO FAN MOTOR. GAS VALVE DEPICTED NOT NECESSARILY VALVE FURNISHED.

MODEL XL, CXL 300-400. TWIN FANS



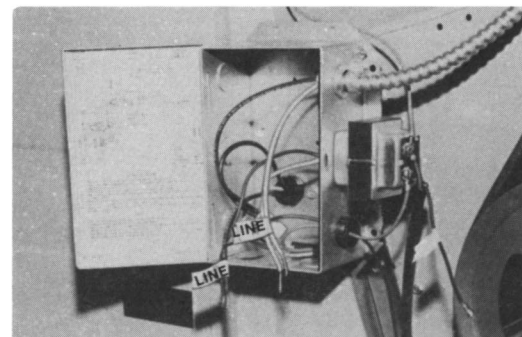
CONNECT POWER SUPPLY TO WIRES MARKED WITH LINE TABS IN LEFT HAND OUTLET BOX

MODEL XLB, CXLB 30-105.



CONNECT POWER SUPPLY TO WIRES MARKED WITH LINE TABS IN OUTLET BOX MOUNTED ON BLOWER ADAPTER. GAS VALVE DEPICTED NOT NECESSARILY VALVE FURNISHED.

MODEL XLB, CXLB 125-300. TWIN FANS

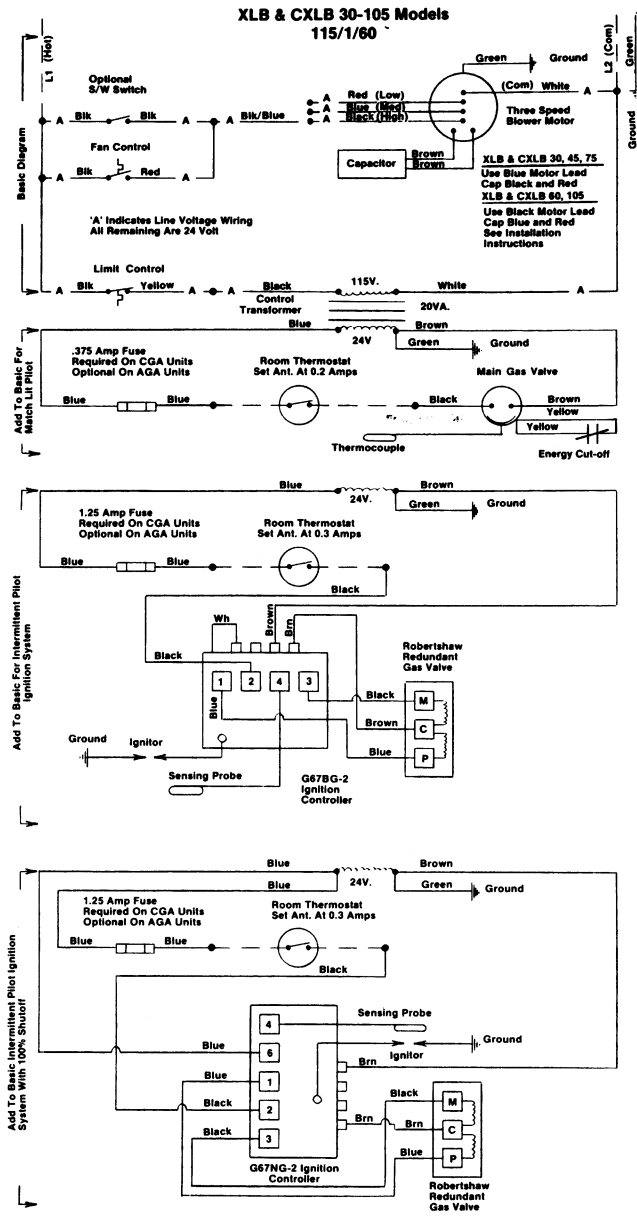
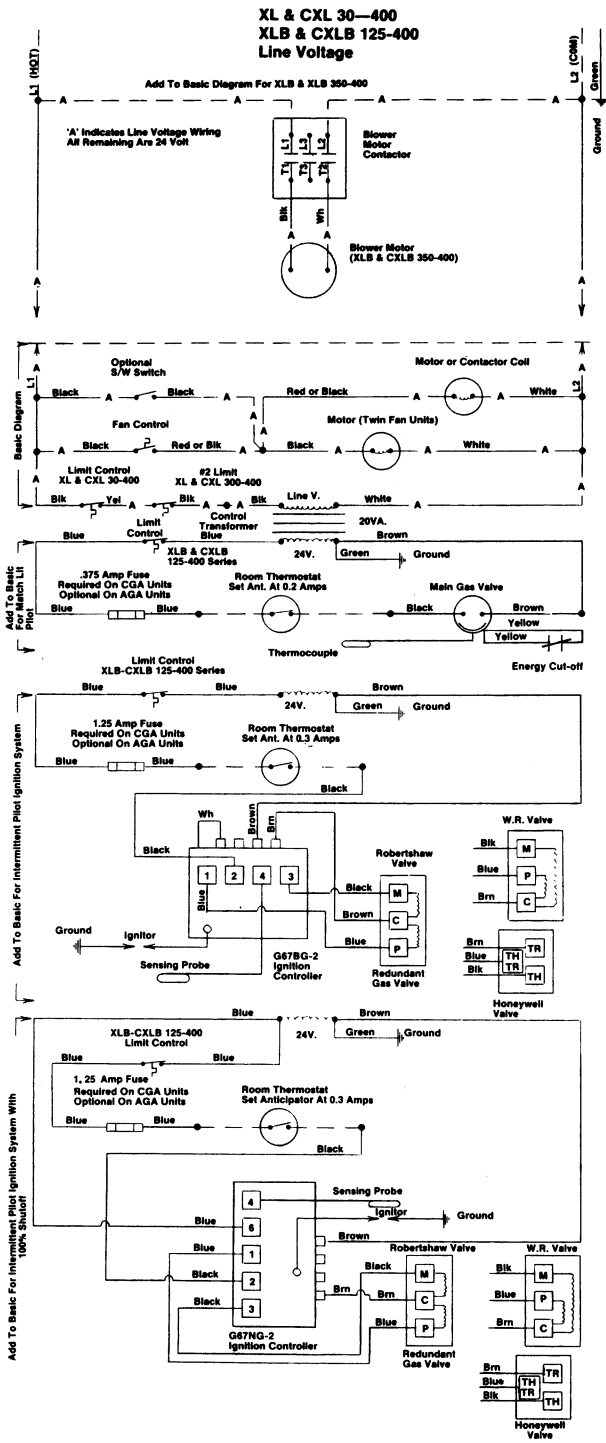


CONNECT POWER SUPPLY TO WIRES MARKED WITH LINE TABS IN OUTLET BOX MOUNTED ON BLOWER ADAPTER.

Model XLB, CXLB 350-400

Connect power supply to screws marked L1 and L2 in blower motor contactor box mounted on top of outlet box.

14. TYPICAL WIRING DIAGRAMS USED ON XL, CXL, XLB AND CXLB UNITS. SCHEMATIC DIAGRAMS BELOW COVER BASIC WIRING AND PILOT SYSTEMS USED, REFER TO DIAGRAM SUPPLIED WITH HEATER FOR ALTERNATE CONTROLS OR OPTIONAL EQUIPMENT DETAILS.



"A" Indicates Line Voltage Wiring. All remaining Are 24 Volt.

FIELD AND REPLACEMENT WIRING NOTES

1. Dotted wiring supplied by others.
2. Thermostat supplied as optional equipment.
3. Use #14 GA. wire for line wiring to unit.
4. Use #18 GA. wire for control wiring.
5. Line and blower motor branch circuit wire sizes should be of a size to prevent voltage drops beyond 5% of supply line voltage.

CAUTION: If any of the original wire as supplied with the appliance must be replaced, it must be replaced with wiring material having a temperature rating of at least 105 Degrees C., except for energy cut off or sensor lead wire which must be 150 Degrees C. See Hazard Levels page 3.

FIELD CONTROL WIRING

Total Wire Length	Minimum Recommended Wire Size
150 Feet	#18 GA.
250 Feet	#16 GA.
350 Feet	#14 GA.

OPERATING SEQUENCE FOR MATCH LIT STANDING PILOT SYSTEM. SEE WIRING DIAGRAM A.

1. Follow lighting instructions and establish pilot.
2. Turn on power energizing control transformer in series with limit control.
3. Thermostat calls for heat, energizing main gas valve.
4. Fan control senses heat exchanger temperature energizing the fan or blower motor.
5. When the thermostat is satisfied the main gas valve is de-energized shutting off gas supply to the main burner.
6. When the unit has cooled the fan control opens shutting off the fan or blower motor.

OPERATING SEQUENCE FOR INTERMITTENT PILOT SYSTEM WITH OR WITHOUT 100% LOCKOUT DEVICE. SEE WIRING DIAGRAM B.

1. Set thermostat at lowest setting.
2. Turn on main and pilot manual gas valves.
3. Turn on power to unit.
4. Set thermostat at desired setting.
5. Thermostat calls for heat energizing the pilot gas valve and spark, to produce a pilot flame on each operating cycle. The sensing probe proves the presence of pilot flame and energizes the safety switch portion of the control. The switch action de-energizes the spark and energizes the main gas valve.
6. Fan control senses heat exchanger temperature energizing the fan or motor/motors.
7. If the pilot flame is extinguished during main burner operation the sensing probe detects the absence of the flame and causes the safety switch to close the main valve and recycle the spark.
- 7A. For recycling pilot system with lockout, 100% shut-off. If the pilot flame is extinguished during main burner operation the sensing probe detects the absence of the flame and causes the safety switch to close the main valve and recycle the spark. If pilot is not established within the timing cycle of the timing device (approximately 120 seconds) unit locks out and must be reset by interrupting power to control circuit. (See Lighting Instructions on unit.)

15. OPERATING VALVES

Units are equipped with 24 volt combination valves containing the automatic electric on-off valve controlled by the room thermostat, the pressure regulator, the safety pilot valve, and manual shutoff valve. The match-lit or standing pilot is standard equipment, and the safety pilot function is actuated by a thermocouple in the pilot flame. Newer models, identified by a label and serial number, also incorporate the ECO switch as described in the following paragraph.

Units may also be equipped with an optional spark-ignited intermittent safety pilot system and a combination valve containing automatic electric on-off valves controlled by the room thermostat, the pressure regulator, an electric pilot safety valve, and manual shut-off valve. The automatic electric valve and the electric safety pilot valve are in series, giving redundant safety shutoff if the limit switch is actuated.

CAUTION: The operating valve is the prime safety shutoff. All gas supply lines must be free of dirt or scale before connecting the unit to insure positive closure. See Hazard Levels Page 3.

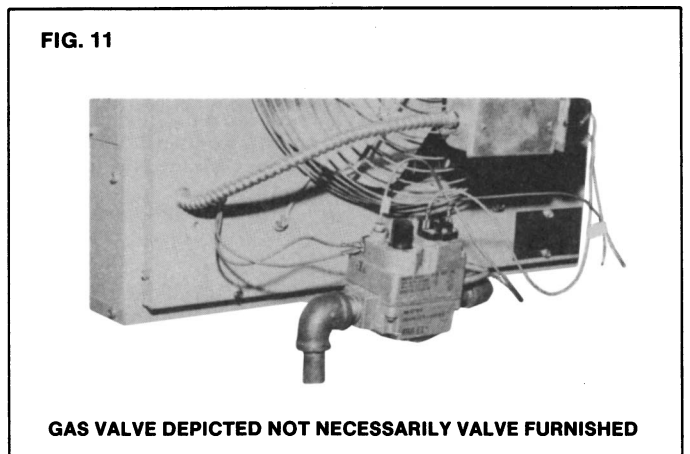
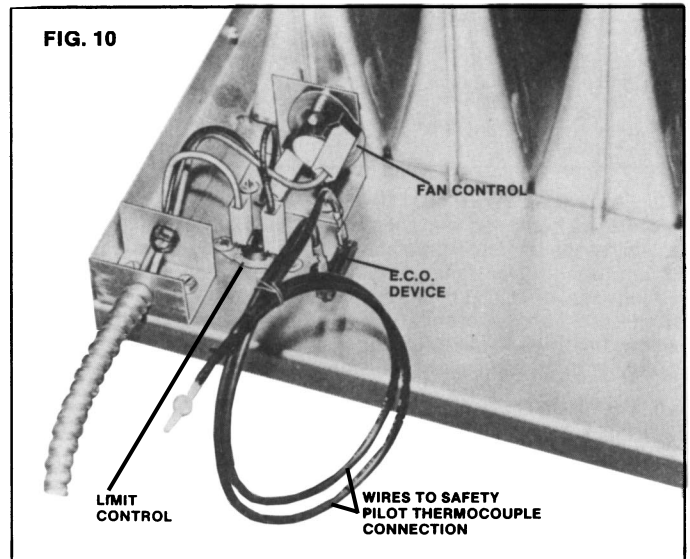
16. LIMIT AND ENERGY CUTOFF CONTROLS (standing pilot models)

Reznor models XL, XLB, CXL, CXLB 30-400 with standing pilot are equipped with an automatic reset high limit control, and on models produced effective April 1983, will be equipped with a fuseable link in the thermocouple circuit which acts to cause safety pilot drop out in case of limit control malfunction or failure of the fan or blower motor in combination with the automatic control valve failing to close. The ECO control acts as a super high limit, giving redundant safety control and is calibrated to open at a much higher temperature than the standard automatic reset limit.

WARNING: An ECO circuit interruption is a major failure caused by a malfunction of the primary safety controls or mis-wiring, and will require correction of the cause of failure and the replacement of the fan and limit control and wiring before the unit can be returned to service. See Hazard Levels page 3.

An ECO fuseable link interruption can be caused by the following combination of failures.

1. Automatic gas valve stuck in open position and electric power supply failure or shutoff.
2. Automatic gas valve stuck in open position and restricted air flow over heat exchanger due to motor failure, loose fan blade, broken blower belt, defective fan control, or improper wiring.
3. Defective automatic reset limit control and failed or ruptured gas pressure regulator.



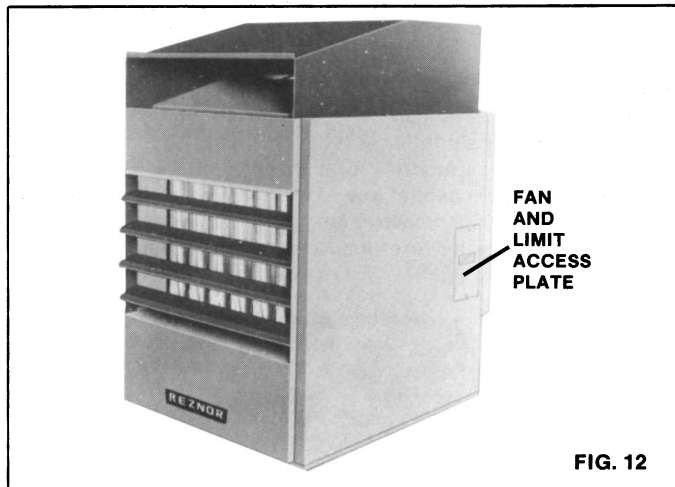
17. LIMIT SWITCH

A non-adjustable high limit switch which shuts off the gas in the event of motor failure or lack of air due to restrictions at inlet or outlet of unit.

18. FAN CONTROL

1. Reznor fan controls provide delay of fan (or blower) operation to prevent the discharge of cold air.
2. The fan control provides additional safety by keeping the fan in operation in the event that the gas valve fails to close when the thermostat is satisfied.
3. To be sure that the fan can continue to operate, the power supply to the heater MUST NOT be interrupted except when servicing the unit.
4. If the customer wants the heater off at night, the gas valve circuit SHOULD BE OPENED by a single pole switch wired in the series with the thermostat. Some thermostats are provided with this feature. Multiple units controlled from single thermostat are shut off in the same manner.

WARNING: If you turn off the power supply, turn off the gas. See Hazard Levels page 3.



19. FAN OR BLOWER MOTOR

Motors are equipped with thermal overload protection of the automatic reset type. Should the motor refuse to run, it may be because of improper current characteristics. Make certain that the correct voltage is available at the motor. Lubricate if provided with oil cups or grease fittings. Standard motor has lifetime lubrication and sleeve bearings. Check current draw to motor rating plate. Adjust pulley or duct static to normal ampere rating of motor.

20. CHECKING INSTALLATION — VERY IMPORTANT!

- A. Check suspension, unit firm and level.
- B. Check gas piping for leaks and proper pressure and suspension, bleed gas line of trapped air (See paragraph 10).
- C. Check electrical wiring connections.
- D. Check vent system for proper installation (See paragraph 9).
- E. Follow operating start-up instructions and place unit in operation. Note operating sequence for with or without lockout system (See paragraph 14).
- F. Fan should start in 30 to 60 seconds.
- G. Turn unit off and on, pausing 2 minutes between each cycle. Observe for smooth ignition.
- H. **With heater on, completely block off fan air. The limit control should open, shutting off gas supply to main burners. This check must be done to insure correct wiring and operating safety.**
- I. Remove blockage and turn off heater. Fan should stop after cool-down period.

21. SERVICING

Like all quality equipment, this unit will operate with a minimum of maintenance. However, to insure long life and satisfactory performance, the following service regimen is recommended.

Heaters should be inspected at start of each heating season where the equipment is operating under normal conditions. If the heaters are located in areas where an unusual amount of dust or soot or other impurities are contained in the air, more frequent inspection is recommended. Check motor for cleanliness. Remove dirt and grease from the blower wheel, the outside of the motor, and especially around the shaft. Check blower pulley and motor pulley to be sure they are secure to shafts. Check belt condition and belt tension. Check fan to be sure it is secure to shaft.

Keep primary and secondary openings free of grease and dirt. The heat exchanger should be checked at least once a year, more often in areas where the air is heavily sooted or dust laden.

To clean the heat exchangers: On Model CXLB 45 thru 105, remove drafthood baffle assembly (inside portion of drafthood) by removing the three screws located at the front of the assembly. To remove, lift slightly and pull forward. Remove "V" shaped baffle from each heat exchanger tube.

After the cleaning procedure is completed, assembly by reversing the disassembly procedure. Make certain that the drafthood baffle assembly is properly seated in the rear retaining clamp. Failure to do so could result in improper or unsafe operation.

On Models CXL and CXLB 140 thru 400, remove all louvers to gain access for removal of the screws that retain the drafthood front baffle (inside portion of drafthood). On Models CXL, CXLB 300, 350 and 400 only remove the center drafthood support located just inside the center of the drafthood. Remove the three (3) front screws located on each side of the drafthood body and remove the drafthood front baffle by pulling forward. Remove screws from hold-down angle and remove hold-down angle. Remove "V" shaped baffle from each tube. After cleaning is complete, assemble by reversing the disassembly procedure. To complete procedure for cleaning heat exchangers proceed as follows: Remove burners or rack assembly to permit free access to the heat exchanger tubes. To clean tubes, take a piece of heavy wire to which a piece of steel wool or similar material is attached at one end. Brush up and down within the tubes until all soot has been removed. With an air hose or brush, clean the outside space between the lower portions of the heat exchanger tubes to remove any accumulated dust or grit deposits. During the annual cleaning of the heat exchanger tubes, it is wise to inspect the burners for plugged ports. Usually such obstructions can be removed with an air hose but if an air hose is not effective, use a thin piece of sheet metal, drawing same across each burner slot. The pilot burner should be dismantled and cleaned periodically. If pilot flame is low or not burning, the unit will not operate.

22. BURNERS

Individual formed steel burners are capable of operating on natural and propane gas are employed in the heater. These burners have accurate die formed ports to give controlled flame stability and operation on both gases without lifting or flashback. All burners are light weight and factory mounted in an assembly which permits all of the burners to be removed as a unit for inspection or service.

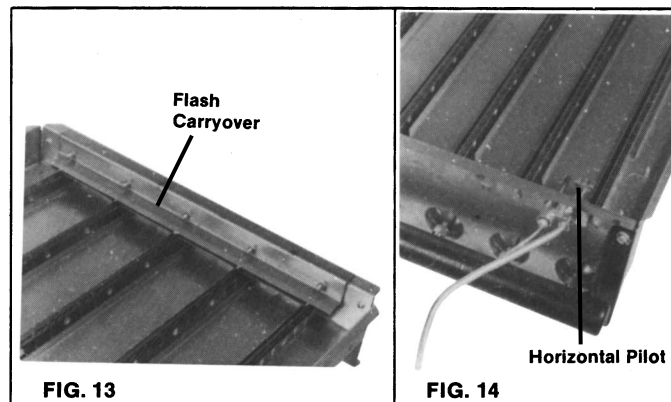
23. BURNER PRIMARY AIR ADJUSTMENT

Burner Primary Air Adjustments: Natural gas units have no air shutters and require no adjustment. Air shutters are supplied on Models 125-400 for propane gas and are locked into position by a slotted screw located below pilot. To adjust air shutters loosen set screw, slide left to close, right to open.

After heater has been in operation for 15 minutes, close air shutters until flame turns yellow. Open air shutter until yellow disappears. Models 30 through 105 for propane have no air shutter and no adjustment is required.

24. CARRYOVER

Figure 13 illustrates the flash carryover. This system receives its gas supply from the main burner ports. During regular service, check this assembly and also the main burner ports for cleanliness.



25. PILOTS

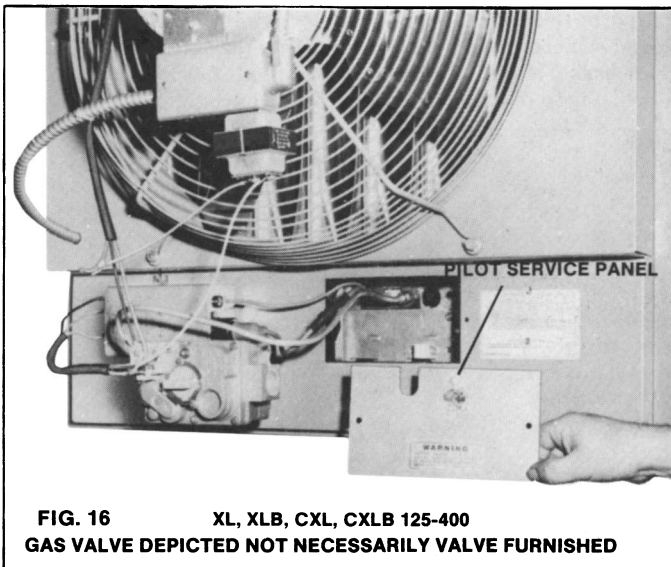
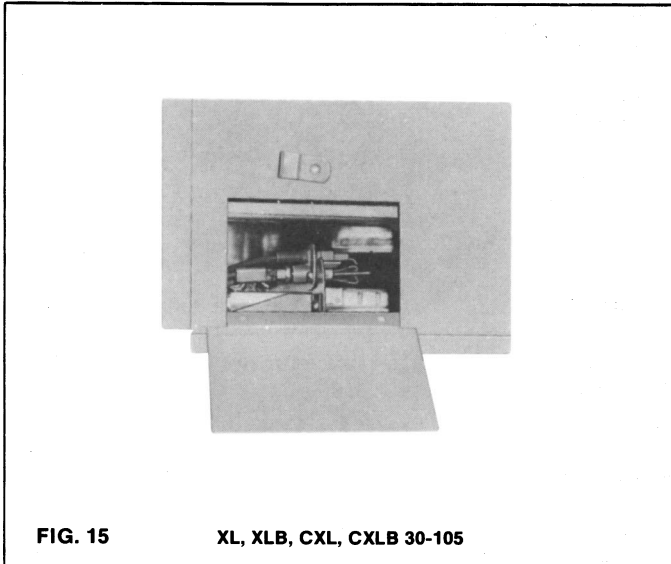
XL, XLB, CXL, CXLB models are equipped with horizontal pilots mounted on the burner tray assembly as shown in Figures 14, 19, 20. Access for service or repair requires burner tray removal. (See Paragraphs 32, 33.) All pilots are of the target, non-linting type, and may be a match-lit thermocouple safety system or, as an option, may be a spark-ignited intermittent electronic safety system. (See Paragraph 28.) Pilot gas pressure should be the same as line pressure, or at 7" W.C. for natural gas or 11" W.C. for propane gas. Pilot mounting locations and spark electrode gap dimensions are shown on Page 11, 12.

26. GAS ORIFICES

To gain access to check or change orifices, refer to paragraph on BURNERS. Heaters are shipped with orifices of proper size and type for gas specified on order. When ordering orifices, give BTUH content and specify gravity of gas as well as model and serial number of heater. See paragraph 35 for orifice size.

WARNING: To insure safety, follow lighting instruction label on pilot access panel. See Hazard Levels page 3.

27. PILOT ACCESS



28. PILOT SYSTEM — OPTIONAL INTERMITTENT ELECTRONIC IGNITION

Natural gas units are equipped with a spark ignited intermittent safety pilot system that shuts off the pilot gas flow between heat cycles. Propane units (or as an option on natural gas units) incorporate a lockout device that stops the gas flow to the pilot if pilot fails to light in 120 seconds. Requires manual reset by interruption of thermostat circuit. Refer to wiring diagram supplied with unit for pilot system identification and proper wiring.

Ignition Controller — The control provides the high voltage spark to ignite the pilot gas and also acts as the flame safety device. After ignition of the pilot gas, the control electronically senses the pilot flame. A separate solid metal probe in the pilot burner assembly is employed for the flame sensing function. A low voltage DC electrical signal is imposed on the metal probe which is electrically insulated from ground. When the pilot flame impinges on the flame sensing probe, the flame acts as a conduction path to ground. This completes the DC circuit. The control now energizes the main gas valve.

Service: No periodic maintenance of the ignition control box is required, however, each season the lead wires should be checked for insulation deterioration and good connections. Spark gap must be maintained to 7/64". Observe pilot flame and in the event of short or yellow flame, it may be due to pilot orifice blockage or lint or dust accumulation around the pilot burner. For further information and checkout procedure, refer to specific control operating instructions supplied with the heater, the wiring diagrams, and trouble-shooting guide on page 17.

CAUTION: Due to high voltage on pilot spark wire and pilot electrode, do not touch when energized. See Hazard Levels page 3.

NOTE: Proper operation of the electronic spark ignition system requires a minimum flame signal as measured by a microammeter. XL, XLB, CXLB 30-400 — 0.2 microamps.

Do not attempt to disassemble the ignition controller. There are no field replaceable components contained in the control enclosure.

29. PILOT LOCATION DETAILS

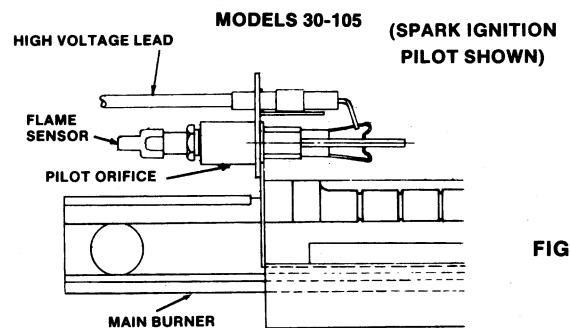
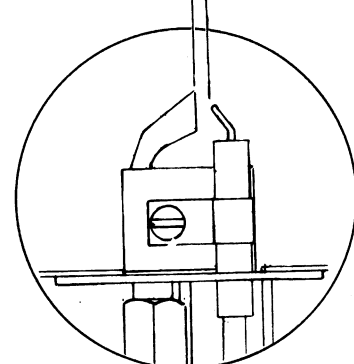


FIG. 17

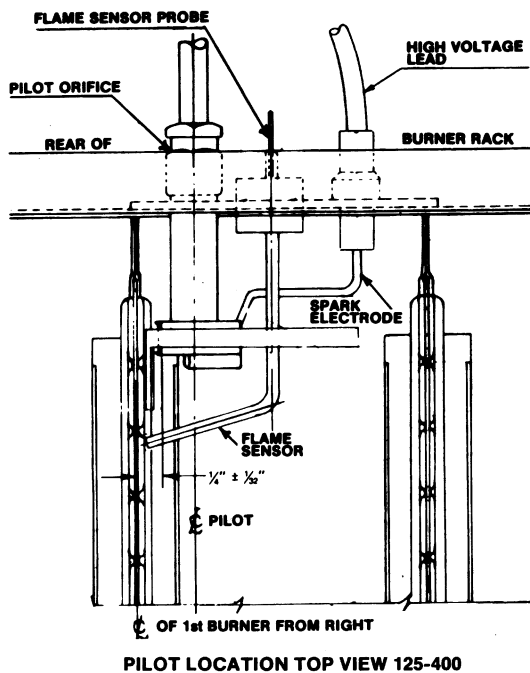
PILOT LOCATION SIDE VIEW

ENLARGED VIEW OF PILOT SPARK GAP



29A. PILOT LOCATION CONTROL

MODELS 125-400 (SPARK IGNITION
PILOT SHOWN)



ENLARGED VIEW OF
PILOT SPARK GAP

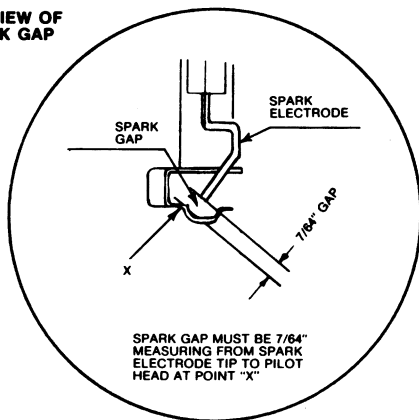


FIG. 18

30. TO REPLACE FAN AND LIMIT CONTROL

1. Turn off gas and power supply.
2. Disconnect power supply lines at junction box on unit. (See photos Figures 10, 19, 20.)
3. Remove defective fan control. If unit is equipped with spring-loaded fan control, mount the new spring-loaded fan control assembly in same mounting holes. If original fan control was **not** the spring-loaded type, install the new spring-loaded fan control assembly by using one screw hole (use left hole as you face the rear of unit). Position bracket securely against heat exchanger tube and drill #20 hole. Attach with sheet metal screw. **IMPORTANT:** Fan control must be held in contact with the heat exchanger tube by spring-action of the new assembly.
4. To replace limit control, remove defective limit control and install new limit in same mounting holes.
5. Reverse steps 1 and 2.
6. Light unit, as per lighting instruction plate.

NOTE:

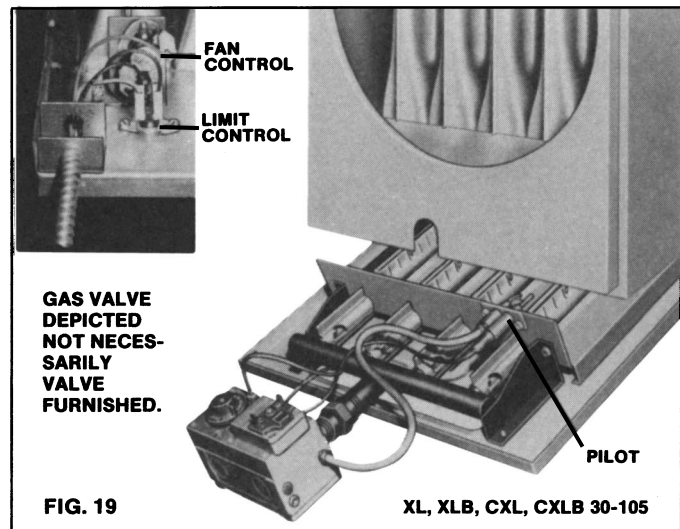
Replace controls, pilots with only factory-authorized parts.

31. VENT SYSTEM — The vent system is to be checked at least once a year for integrity. Inspection is to include all joints, seams, and the vent cap. Replace any defective parts.

32. XL, XLB, CXL, CXLB 30 THROUGH 105, BURNER REMOVAL FOR INSPECTION AND SERVICE.

(1) Turn off electrical supply. (2) Turn gas supply off ahead of combination valve. (3) Disconnect wiring at combination valve. (4) Disconnect gas supply ahead of combination valve. (5) Remove two sheet metal screws located at the rear corners of the bottom panel-burner rack assembly. (6) Allow bottom panel-burner rack assembly to drop slightly. Push entire assembly forward until free of heater. (7) To replace bottom panel-burner rack assembly, reverse procedure outlined above. Light unit according to lighting instructions on heater. (See Fig. 19)

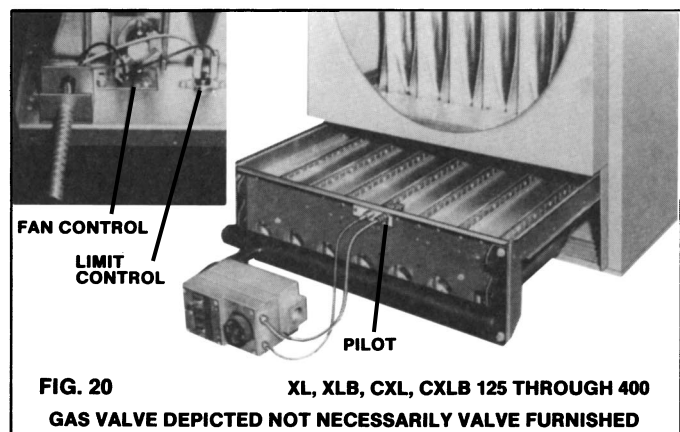
Removal of Individual Burners: (1) Remove bottom panel-burner rack as outlined above. (2) Remove two sheet metal screws retaining pilot burner assembly to burner rack. (3) Remove sheet metal screws to free manifold from bottom panel and burner rack. (4) Remove manifold and pilot burner as an assembly. (5) Remove carryover assembly and burner retention plate. (6) Lift burner upward to clear slot in rear of burner rack and pull burner toward slot. (7) To replace individual burner reverse procedure outlined above.



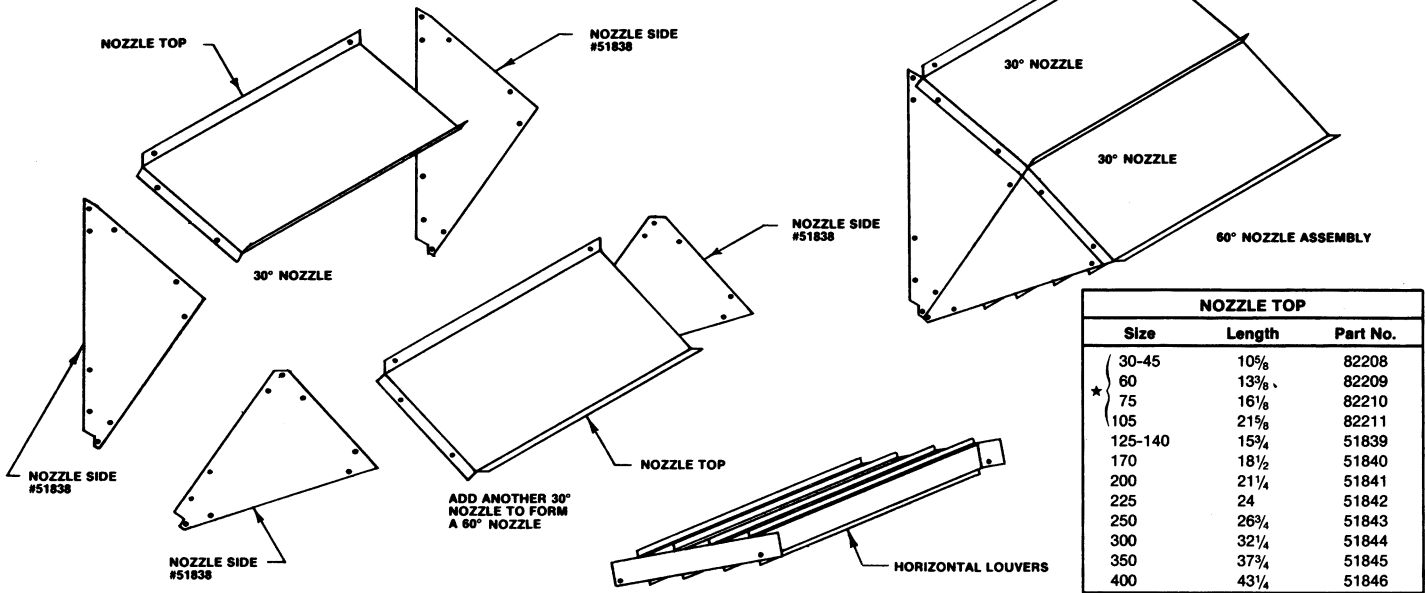
33. XL, XLB, CXL, CXLB 125 THROUGH 400, BURNER REMOVAL FOR INSPECTION AND SERVICE

(1) Turn off electric supply. (2) For XL, XLB, CXL, CXLB 125-400. Turn off gas supply ahead of combination valve. (3) Remove bottom back panel (located between fan guard beneath blower adapter plate by removing the two screws from each side. (4) Disconnect electric valve leads. (5) Disconnect gas supply ahead of combination valve. (6) Remove two screws in bottom of burner drawer assembly. (7) Pull burner drawer out.

To Disassemble Burner Drawer: (1) Remove screws holding flash carryover (located at rear of burner drawer). (2) Remove burner hold down clamp (located inside burner drawer underneath pilot). (3) Pull main burners horizontally away from injection opening and lift out. (4) To re-assemble reverse above procedure.

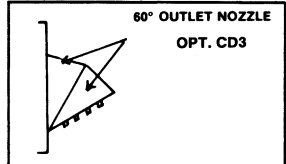
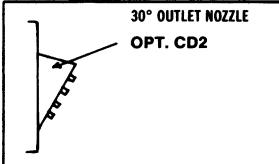


34. 30°-60° NOZZLE ASSEMBLY INSTRUCTION FOR XL, XLB, CXL, CXLB 30-400



- Remove horizontal louver frame from unit.
- Assemble 30° nozzle sides to nozzle top using (4) No. 10 x 1/2" long sheet metal screws making sure the top edge with the 1/8" diameter holes is flush with front edge of sides.
- Assemble nozzle to heater with (2) No. 10 x 1/2" long sheet metal screws on each side. Drill 1/8" diameter holes through top back edge of nozzle into top front panel of heater. Secure with No. 10 x 1/2" sheet metal screws.
- Assemble horizontal louver frame to outlet of nozzle using No. 10 x 1/2" sheet metal screws.
- If Optional vertical louvers are used, assemble vertical louver assembly to outlet of nozzle with No. 10 x 1/2" long sheet metal screws. The top is secured by bending the tabs on the top of the vertical louver assembly back around the top front edge of the nozzle. Position vertical louvers as desired.

NOTE: Outlet nozzle options do not include louvers. The horizontal louvers supplied with the unit are to be installed in the nozzle outlet. Optional, "Vertical Louvers", may be added to the 30° nozzle for additional air pattern spread. **Do not use vertical louvers in combination with horizontal louvers on fan-type unit heaters and the 60° outlet nozzle.**



★ NOTE: DOWNTURN NOZZLES ARE NOT TO BE USED ON FAN TYPE XL, CXL MODELS 30 THRU 105.

35. MAIN BURNER AND PILOT ORIFICES, MODELS XL, XLB

MODEL SIZE	DRILL SIZE NATURAL GAS	PART NO.	DRILL SIZE REGULATED PROPANE GAS	PART NO.	
30	53 (3)	9789	63 (3)	40415	
45	49 (3)	39651	1.15 MM (3)	63922	
60	49 (4)	39651	1.15 MM (4)	63922	
75	49 (5)	39651	1.15 MM (5)	63922	
105	49 (7)	39651	1.15 MM (7)	63922	
125	41 (5)	11792	1.45 MM (5)	61652	
140	38 (5)	45870	1.55 MM (5)	61653	
150	41 (6)	11792	1.45 MM (6)	61652	
170	38 (6)	45870	1.55 MM (6)	61653	
200	38 (7)	45870	1.55 MM (7)	61653	
225	38 (8)	45870	1.55 MM (8)	61653	
250	39 (9)	45871	1.55 MM (9)	61653	
300	39 (11)	45871	53 (11)	9789	
350	39 (13)	45871	53 (13)	9789	
400	39 (15)	45871	53 (15)	9789	
Match Pilot	Pilot Orifice 30 thru 105	Style No. 4213 (1)	40966	Style No. 4207 (1)	40965
	Pilot Orifice 125 thru 400	Style No. 6218 (1)	46392	Style No. TV011 (1)	67058
Spark Pilot	Pilot Orifice 30 thru 105	Style No. TV016 (1)	68247	Style No. TV009 (1)	68248
	Pilot Orifice 125 thru 400	Style No. 7223	63397	Style No. 4209	37801

Number in parentheses is number required.

35B. MAIN BURNER AND PILOT ORIFICES, MODELS CXL, CXLB

MODEL SIZE	DRILL SIZE NATURAL GAS	PART NO.	DRILL SIZE REGULATED PROPANE GAS	PART NO.	
30	53 (3)	9789	63 (3)	40415	
45	1.8 MM (3)	86512	57 (3)	40416	
60	1.8 MM (4)	86512	57 (4)	40416	
75	1.8 MM (5)	86512	57 (5)	40416	
CXL-105	1.8 MM (7)	86512	57 (7)	40416	
CXLB-105	50 (7)	39652	58 (7)	39659	
140	42 (5)	84437	1.45 MM (5)	61652	
170	42 (6)	84437	1.45 MM (6)	61652	
200	42 (7)	84437	1.45 MM (7)	61652	
225	42 (8)	84437	1.45 MM (8)	61652	
250	42 (9)	84437	1.45 MM (9)	61652	
300	42 (11)	84437	1.45 MM (11)	61652	
350	42 (13)	84437	1.45 MM (13)	61652	
400	42 (15)	84437	1.45 MM (15)	61652	
Match Pilot	Pilot Orifice 30 thru 105	Style No. 4213 (1)	40966	Style No. 4207 (1)	40965
	Pilot Orifice 125 thru 400	Style No. 6218 (1)	46392	Style No. TV011 (1)	67058
Spark Pilot	Pilot Orifice 30 thru 105	Style No. TV016 (1)	68247	Style No. TV009 (1)	68248
	Pilot Orifice 125 thru 400	Style No. 7223	63397	Style No. 4209	37801

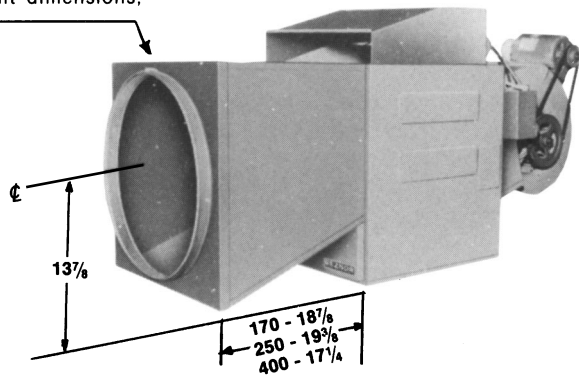
Number in parentheses is number required.

36. POLYTUBE OUTLET NOZZLE

OPTION CD6

NOTE: Nozzle is a transition duct from unit width to the outlet flange. See unit dimensions, Page 2.

Photo shows polytube outlet mounted on an XLB unit. The outlet nozzle is shipped knocked down, and mounts on the standard XLB, CXLB unit in place of the top front panel and louvers.



APPLICATION

The optional outlet nozzle is designed to allow the attachment of polytube-type air distribution for use in greenhouse and industrial buildings. Standard blower and drive are designed to handle rated CFM at .2 ESP, and will inflate a 24" tube up to 150' long. See table for proper free area, minimum number of holes and sizes. Units may be used for greenhouse heating and ventilating or in industrial applications requiring high mounting heights or spot heating by means of poly-tube distribution.

GREENHOUSE APPLICATION:

For greenhouse use, the number of units required is generally based on an air flow volume of 1½ to 2 CFM per square foot of house floor area. Depending on heat loss requirements of house type, location, and desired temperature above ambient, the ventilation requirements determine the number of distribution systems required and the heat loss the BTUH heater size required. As a general rule, a single system will serve a maximum house width of 30 feet and a length of 150 feet.

INDUSTRIAL APPLICATION:

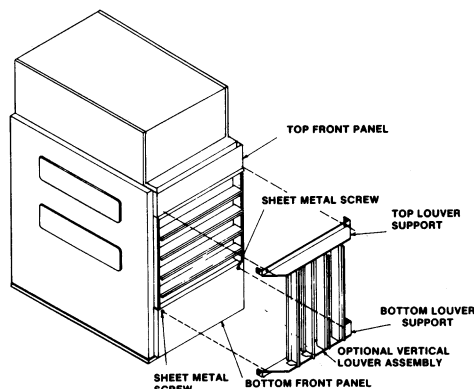
For industrial applications mounting units as close to the ceiling as possible and using poly-tube distribution to direct heat to point of use will recover warm air stratified at the ceiling for improved operating efficiency. A poly-tube distribution system can deliver warm air to the working area reducing the need for complete area heating.

Reznor does **not** stock polyethylene tubing due to the many lengths and hole patterns required for each application. Tubing can be ordered from a local greenhouse supply distributor or from Sto-Cote Products, Inc., Drawer 310, Richmond, Illinois 60071.

Unit Model No.	CFM @ .2 esp	Diameter of Polytube	Minimum Sq. Inch Free Area	Holes	SUGGESTED HOLE SIZES & LOCATIONS				
					Length of Polytube				
					50 Ft.	75 Ft.	100 Ft.	125 Ft.	150 Ft.
170	1,680	24"	276	Number	50 pairs	50 pairs	200 pairs	187 pairs	180 pairs
				Diameter	1 7/8"	1 7/8"	1"	1"	1"
				Spacing	12"	18"	6"	8"	10"
250	2,470	24"	374	Number	40 pairs	75 pairs	75 pairs	75 pairs	75 pairs
				Diameter	2 1/2"	1 7/8"	1 7/8"	1 7/8"	1 7/8"
				Spacing	15"	12"	16"	20"	24"
400	3,950	24"	547	Number	60 pairs	60 pairs	60 pairs	100 pairs	100 pairs
				Diameter	2 1/2"	2 1/2"	2 1/2"	1 7/8"	1 7/8"
				Spacing	10"	15"	20"	15"	18"
3" dia. = 7.07 sq. in.		2 1/4" dia. = 3.98 sq. in.		1 7/8" dia. = 2.76 sq. in.					
2 1/2" dia. = 4.91 sq. in.		2" dia. = 3.14 sq. in.		1" dia. = 0.785 sq. in.					

CAUTION: To prevent overheating of the blower unit heater and to insure correct air distribution, the minimum hole area must be provided as shown in the table for each model as listed. If more holes are used, do not exceed 1.25 times the minimum area shown to insure proper tube inflation. Tube lengths up to 150 feet may be used when hole area is held to the minimum listed. See Hazard Levels page 3.

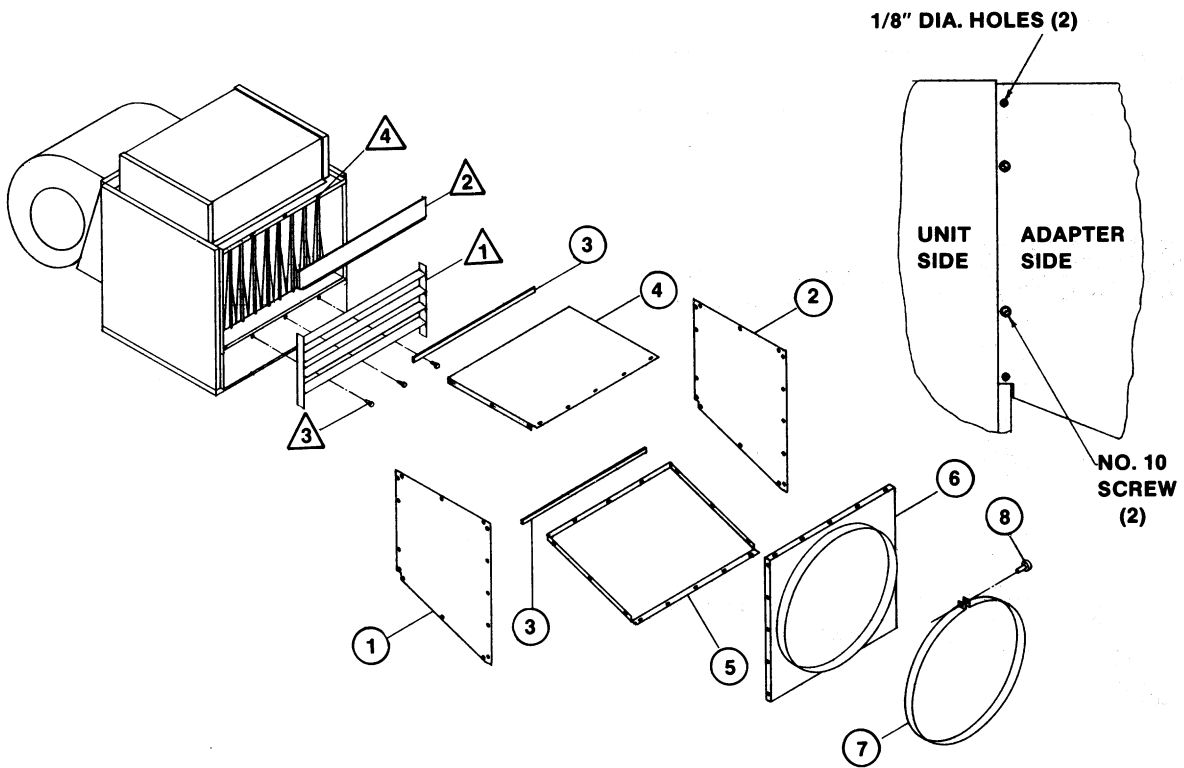
37. TO FIELD INSTALL VERTICAL LOUVERS



1. Remove and set aside indicated sheet metal screws.
2. Position vertical louver assembly against heater and line up holes in bottom louver support with holes in bottom front panel.
3. Insert sheet metal screws and tighten.
4. Using holes in top louver support as guides, drill two 1/8" diameter holes in top front panel.
5. Insert No. 10 sheet metal screws and tighten.
6. Position vertical louvers as desired.
7. When installed on downturn nozzles assemble vertical louver assembly to outlet of nozzle with 10 x 1/2" long sheet metal screws. The top is secured by bending the tabs on the tops on the top of the vertical louver assembly back around the top front edge of the nozzle.

38. POLYTUBE OUTLET NOZZLE ASSEMBLY INSTRUCTIONS

1. Remove louver assembly **1** from furnace.
2. Remove top front panel **2** from furnace.
3. Remove screws from face of bottom front panel **3**.
4. Line the two holes up on the adapter side **1** to the unit side panel and screw together with two #10-1/2" sheet metal screws.
See insert drawing.
5. Repeat Step 4 for opposite adapter side panel **2**.
6. Drill two 1/8" Dia. holes in unit side panel through holes provided in the adapter side panel **1** and secure with two #10-1/2" sheet metal screws.
7. Repeat Step 6 for adapter side panel **2**.
8. Place adapter top panel **4** on outside edges of side panel adapters **1** and **2**. Line adapter top panel **4** and gasket **3** up with the holes in the duct angle **4** and secure with #10-1/2" sheet metal screws.
9. Placing the adapter bottom **5** on the outside edges of the side panel adapters **1** and **2** line the adapter bottom **5** and the gasket **3** up with the holes in the face of the bottom front panel **3** and secure with #10-1/2" sheet metal screws.
10. Place the discharge panel assembly **6** over the outside of the front box formed by the adapter top, bottom and sides. Secure to the assembly using the remaining #10-1/2" sheet metal screws.
11. Place one end of field supplied polytube, holes down, over over collar ring on discharge panel assembly **6**. Slip discharge duct collar clamp **7** over polytube and collar ring. Secure clamp to ring with #10-3/4" large sheet metal screw **8**.
12. Support and close off end of field supplied polytube as required.



PARTS LIST

	DESCRIPTION	MODEL 170		250		400	
		PART NO.	NO. REQD.	PART NO.	NO. REQD.	PART NO.	NO. REQD.
1	Left Adapter Side	82056	1	74216	1	82063	1
2	Right Adapter Side	82057	1	74216	1	82064	1
3	Gasket	82060	2	74219	2	82067	2
4	Adapter Top	82058	1	74217	1	82065	1
5	Adapter Bottom	82059	1	74218	1	82066	1
6	Discharge Panel Assembly	74220	1	74220	1	74220	1
7	Discharge Duct Collar Clamp	50901	1	50901	1	50901	1
8	#10-3/4" Lg. Sheet Metal Screw	20859	1	20859	1	20859	1
9	#10-1/2" Lg. Sheet Metal Screw	11813	42	11813	42	11813	43

39. MODEL XLB, CXLB 30-105 BLOWER-FILTER CABINET

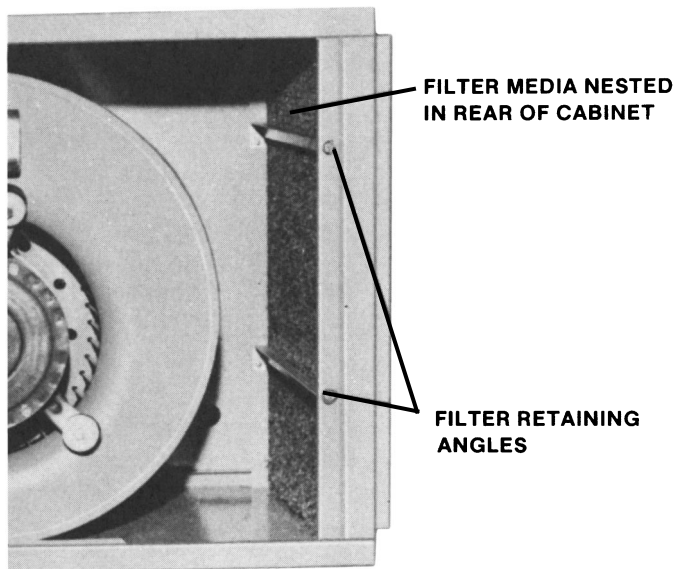
Model types XLB, CXLB 30-105 may be factory equipped with a blower cabinet enclosing the blower which provides a return air duct connection. Provision for a filter is optionally available for the 60, 75, and 105 models.

XLB, CXLB SIZE	CABINET OPTION NO.	FILTER OPTION NO. — SIZE	FILTER PART NO.
30	AR2	Not available	N/A
45	AR2	Not available	N/A
60	AR2	AW3 - 1 x 13¼ x 16½	82189
75	AR2	AW3 - 1 x 16 x 16½	82190
105	AR2	AW3 - 1 x 21½ x 16½	82191

Filter option includes frameless permanent filter media and retaining angles. May be field or factory installed in blower compartment.

To clean or replace air filter:

1. Remove cabinet door (either side).
2. Remove screw from end of retaining angle.
3. Move angle forward and slide out filter. Clean with detergent and water.
4. If replacing filter, replace with same type and cut size as the original.

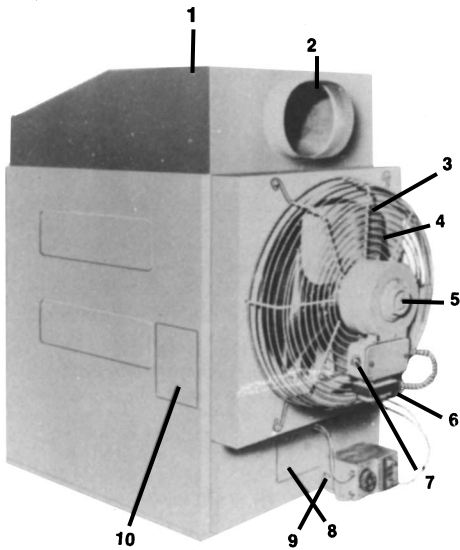


40. TROUBLE SHOOTING

TROUBLE	PROBABLE CAUSE	REMEDY
PILOT WILL NOT LIGHT (MATCH LIT SYSTEM)	<ol style="list-style-type: none"> 1. Pilot cock turned off. 2. Air in gas line. 3. Incorrect lighting procedure. 4. Dirt in pilot orifice. 5. Extremely high or low gas pressure. 6. Bent or kinked pilot tubing. 7. Failed E.C.O. Device. 	<ol style="list-style-type: none"> 1. Open valve. 2. Disconnect pilot line at shut off. Bleed air from gas supply line. 3. Follow instructions on cover of junction box. 4. Remove orifice. Clean with compressed air or solvent (do not ream). 5. Check line pressure. This should be 3 oz. or 5 in. water pressure, minimum; 8 oz. or 15 in., maximum. (See paragraph 10). 6. Replace tubing. 7. Replace E.C.O. device (see paragraph 16).
PILOT WILL NOT LIGHT (SPARK IGNITION SYSTEM)	<ol style="list-style-type: none"> 1. Manual valve not open. 2. Air in gas line. 3. Dirt in Pilot Orifice. 4. Gas pressure too high or too low. 5. Kinked pilot tubing. 6. Pilot valve does not open. 7. No spark: <ol style="list-style-type: none"> A. Loose wire connections. B. Transformer failure. C. Incorrect spark gap. D. Spark Cable shorted to ground. E. Spark electrode shorted to ground. F. Drafts affecting pilot. G. Ignition control box not grounded. H. Faulty ignition control. 8. Optional lockout device interrupting control circuit by above causes. 	<ol style="list-style-type: none"> 1. Open manual valve. 2. Bleed gas line. 3. Remove and clean with air pressure. 4. Adjust supply pressure to maximum of 8" or minimum of 5" for natural gas and 11" for propane gas. 5. Replace tubing. 6. If 24V available at valve, replace valve. 7. <ol style="list-style-type: none"> A. Be certain all wire connections are solid. B. Be certain 24 volts is available. C. Maintain spark gap at 7/64". D. Replace worn or grounded spark cable. E. Replace pilot if ceramic spark electrode is cracked or grounded. F. Make sure all panels are in place and tightly secured to prevent improper or unusual drafts at pilot. G. Make certain ignition control is grounded to furnace chassis. H. If 24V is available to ignition controller and all other causes have been eliminated, replace ignition control (See paragraph 28). 8. Reset lockout by interrupting control circuit at thermostat.
PILOT LIGHTED BUT MAGNETIC GAS VALVE WILL NOT OPEN. (ALL MANUAL VALVES ARE OPEN) (MATCH LIT SYSTEM)	<ol style="list-style-type: none"> 1. Power not turned on or thermostat not calling for heat. 2. Circuit to magnetic valve open. 3. Faulty transformer. 4. Faulty or dirty thermocouple or safety pilot switch, or failed E.C.O. device. 5. Faulty thermostat. (See instruction sheet supplied.) 6. Faulty magnetic valve. 7. High gas pressure. 	<ol style="list-style-type: none"> 1. Turn on power, check fuses, turn up thermostat. 2. Check wiring and connections at transformer and thermostat. 3. Replace transformer. 4. Clean and test with millivolt meter or test kit. Replace defective part. 5. Replace thermostat. 6. Replace valve or magnetic head. 7. Maximum gas pressure 8 oz. or 15" W.C. (See paragraph 10).
PILOT LIGHTS, MAIN VALVE WILL NOT OPEN (SPARK IGNITION SYSTEM)	<ol style="list-style-type: none"> 1. Manual valve not open. 2. Main valve not operating: <ol style="list-style-type: none"> A. Defective valve. B. Loose wire connections. 3. Ignition control does not power main valve: <ol style="list-style-type: none"> A. Loose wire connections. B. Flame sensor grounded. (Pilot lights — spark continues). C. Gas pressure incorrect. D. Cracked ceramic at sensor. E. Faulty ignition control. 	<ol style="list-style-type: none"> 1. Open manual valve. 2. <ol style="list-style-type: none"> A. Replace if 24V is measured at valve connections and valve remains closed. B. Check and tighten all wiring connections. 3. <ol style="list-style-type: none"> A. Check and tighten all wiring connections. B. Be certain flame sensor lead is not grounded or insulation or ceramic is not cracked. Replace as required. C. Set supply pressure at 5" to 8" for natural gas — 11" for propane. D. Replace sensor. E. See paragraph 28. If all checks indicate no other cause, replace ignition control. DO NOT ATTEMPT TO REPAIR IGNITION CONTROL. THERE ARE NO FIELD REPLACEMENT COMPONENTS CONTAINED IN THIS DEVICE.
NO HEAT (HEATER OPERATING)	<ol style="list-style-type: none"> 1. Dirty filters. 2. Incorrect manifold pressure or orifices. 3. Cycling on limit control. 4. Improper thermostat location or adjustment. 5. Belt slipping on blower. 	<ol style="list-style-type: none"> 1. Clean or replace filters. 2. Check manifold pressure. (See paragraph 10). 3. Check air throughput. (See paragraph 7). 4. See thermostat instructions. 5. Adjust belt tension.
COLD AIR IS DELIVERED ON START UP DURING OPERATION	<ol style="list-style-type: none"> 1. Fan control improperly wired. 2. Defective fan control. 3. Blower set for too low temperature rise. 4. Incorrect manifold pressure. 	<ol style="list-style-type: none"> 1. Connect as per wiring diagram inside junction box cover. 2. Replace fan control. 3. Slow down blower or increase static pressure. (See paragraph 7). 4. Check manifold line pressure. (See paragraph 10).
MOTOR WILL NOT RUN	<ol style="list-style-type: none"> 1. Circuit open. 2. Fan control inoperative. 3. Contactor inoperative. 4. Defective motor or capacitor. 	<ol style="list-style-type: none"> 1. Check wiring and connections. 2. Replace fan control. 3. Replace contactor. 4. Replace motor or capacitor.
MOTOR TURNS ON AND OFF WHILE BURNER IS OPERATING (SEE MOTOR CUTS OUT ON OVERLOAD)	<ol style="list-style-type: none"> 1. Fan control improperly wired. 2. Defective fan control. 3. Poor contact between fan control and heat exchanger tube. Surface contact required. 4. Motor overload device cycling on and off. 5. Three phase motor rotating in opposite direction. 	<ol style="list-style-type: none"> 1. Connect as per wiring diagram. 2. Replace fan control. 3. Check for bent mounting or loose mounting screws. 4. Check motor load against motor rating plate. Replace motor or overload device. 5. Interchange two legs on supply connections.
MOTOR CUTS OUT ON OVERLOAD (BLOWER TYPE)	<ol style="list-style-type: none"> 1. Improper motor pulley adjustment. 2. Improper static pressure in duct system. 3. Low voltage. 	<ol style="list-style-type: none"> 1. See instructions on air throughput. (See paragraph 7). 2. Adjust dampers in duct system. 3. Check power supply.
MOTOR CUTS OUT ON OVERLOAD FAN TYPE	<ol style="list-style-type: none"> 1. Low or high voltage supply. 2. Defective motor. 3. Poor air flow. 4. Defective bearing or lubrication. 	<ol style="list-style-type: none"> 1. Connect electric supply. 2. Replace motor. 3. Clean motor — fan — fan guard. 4. Lubricate bearings or replace motor.

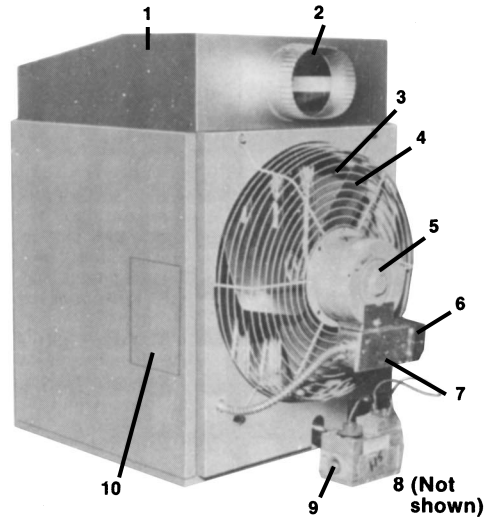
41. GENERAL ARRANGEMENT

MODEL XL, CXL 125-400



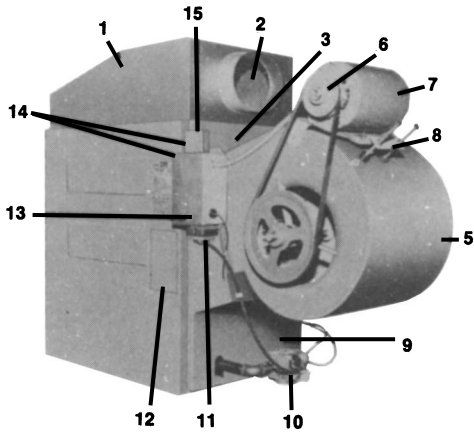
1. Draft Diverter
2. Flue Outlet
3. Fan Guard
4. Fan Blade
5. Fan Motor
6. 24V Transformer
7. Field Wiring Connection
8. Pilot Access Panel (Right Side 30-105)
9. Combination Valve
10. ECO, Fan and Limit Access Panel

MODEL XL, CXL 30-105



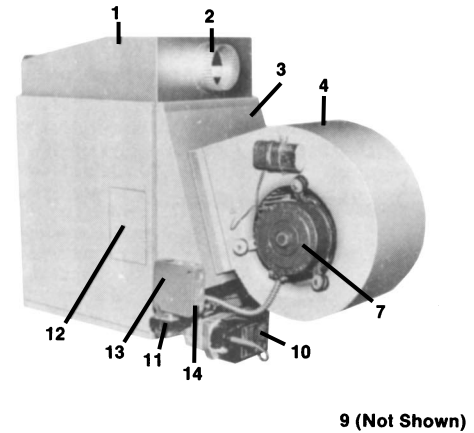
GAS VALVE DEPICTED NOT NECESSARILY VALVE FURNISHED

MODEL XLB, CXLB 125-400



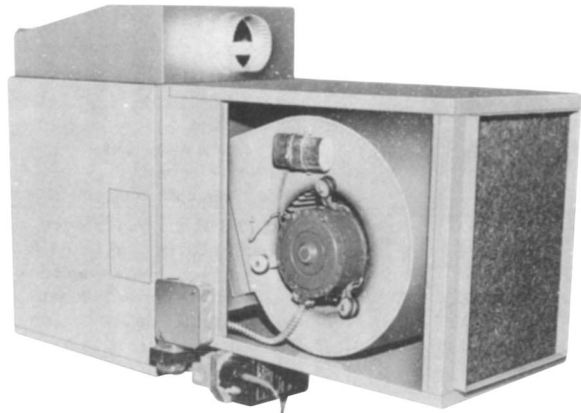
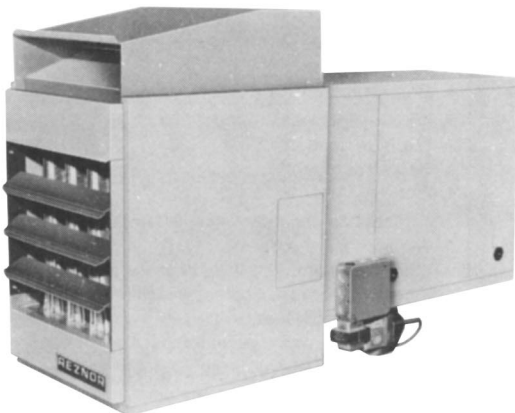
1. Draft Diverter
2. Flue Outlet
3. Blower Mount
4. Blower (Direct Drive 30-105)
5. Blower (Belt Drive 125-400)
6. Adjustable Motor Pulley
7. Blower Motor
8. Belt Adjustment
9. Pilot Access Panel (Right Side 30-105)
10. Combination Valve
11. 24V Transformer
12. ECO, Fan and Limit Access Panel
13. Junction Box (with Contactor where required)
14. Field Wiring Connection
15. Optional Blower Motor Contactor. (Standard on 350 and 400 models only)

MODEL XLB, CXLB 30-105



GAS VALVE DEPICTED NOT NECESSARILY VALVE FURNISHED

MODEL XLB, CXLB 30-105 WITH OPTIONAL FACTORY INSTALLED BLOWER CABINET



GAS VALVE DEPICTED NOT NECESSARILY VALVE FURNISHED

MULTIPLE UNIT WIRING

IMPORTANCE OF FAN CONTROL

1. Reznor fan controls provide the following: **A.** Delay of fan (or blower) operation preventing circulation of cold air. **B.** Fan operation as long as the unit is hot. **2.** The fan control provides additional safety by keeping the fan in operation in the event that the gas valve fails to close when the thermostat is satisfied. **3.** To be sure that the fan can continue to operate, the power supply to the heater must not

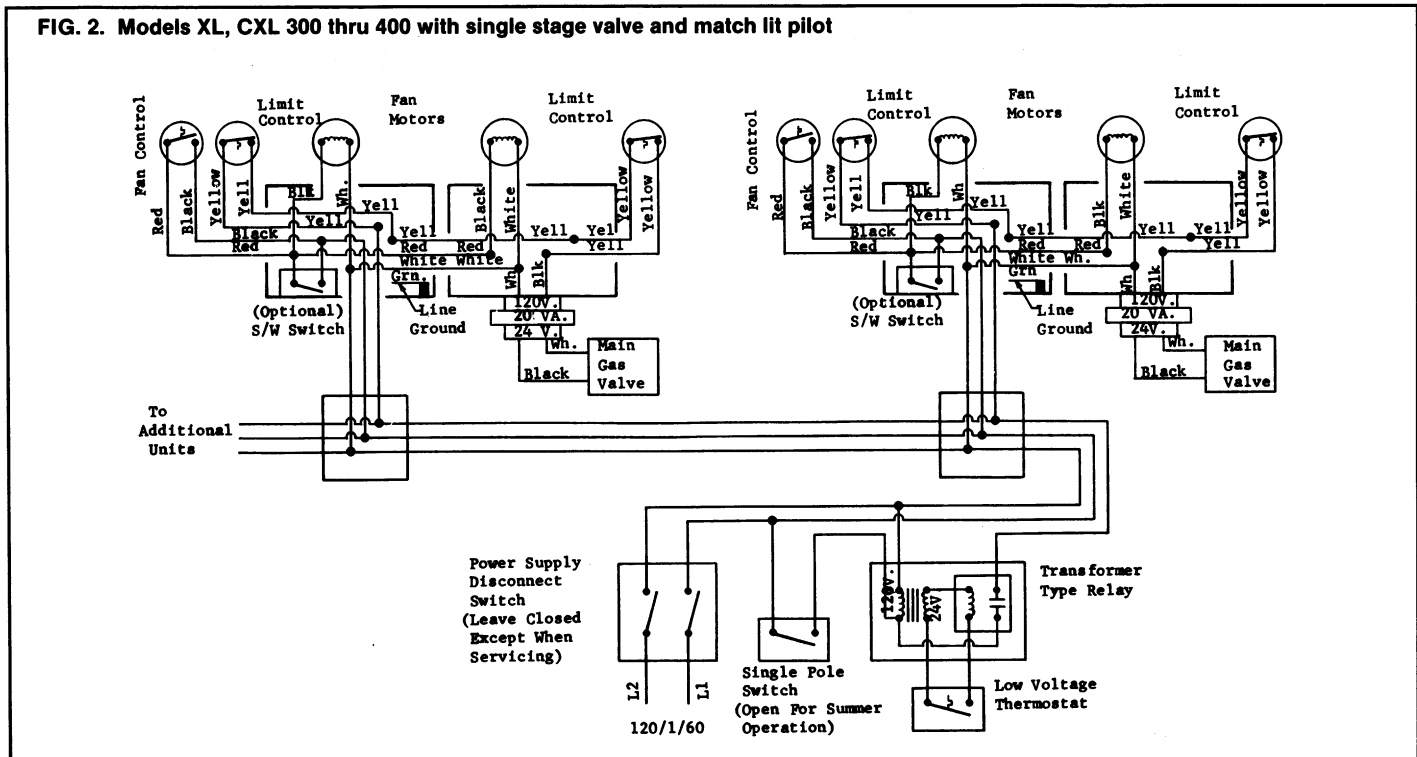
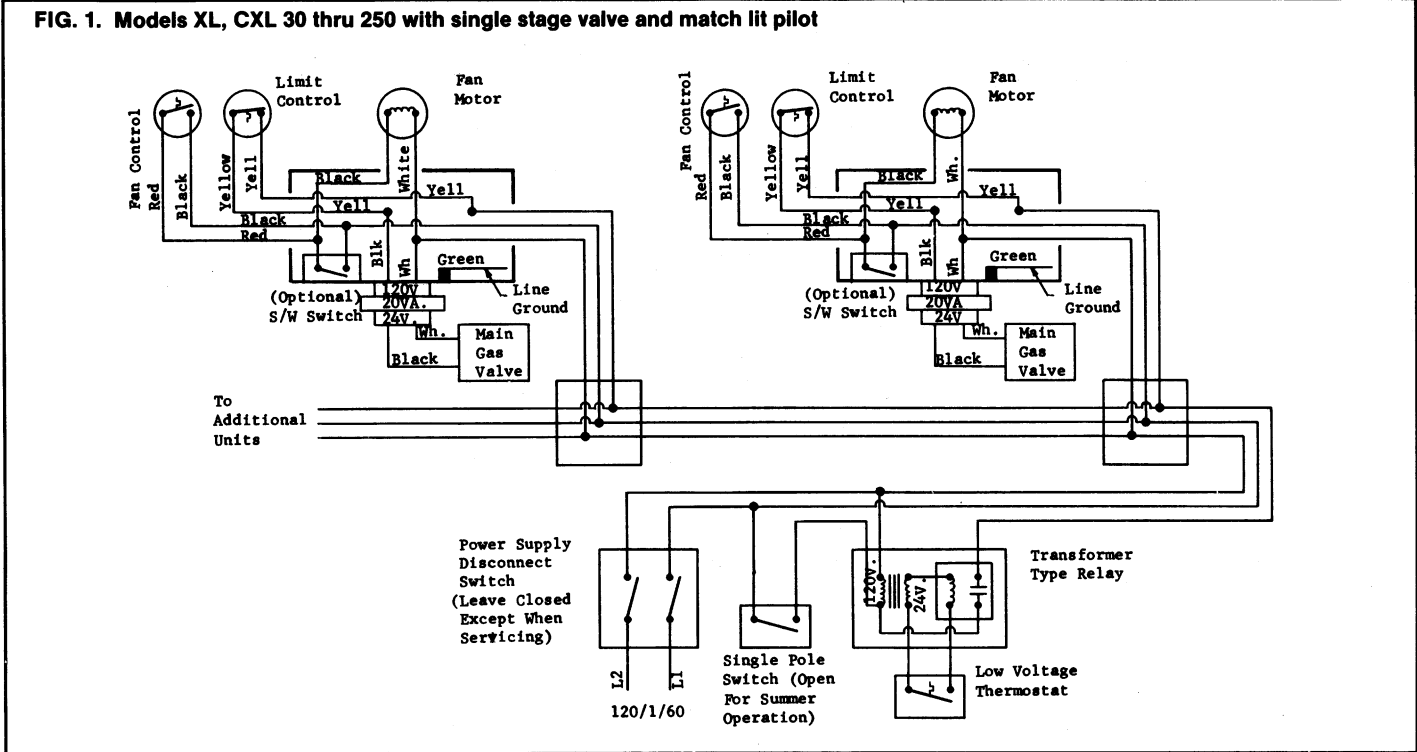
be interrupted except when servicing the unit. **4.** If the customer wants the heater off at night, the gas valve circuit should be opened by a single pole switch wired in series with the thermostat. Some thermostats are provided with this feature. Multiple units controlled from single thermostat are shut off in the same manner.

WARNING: If you turn off the power supply, turn off the gas. Failure to comply could result in severe personal injury or death.

MULTIPLE UNIT WIRING — LOW VOLTAGE THERMOSTAT

Several units may be operated from a single, low voltage thermostat by using the wiring schemes illustrated in Figures 1 and 2. Note that a field supplied transformer relay must be used and that all units are activated thru line voltage (115 volt) connections.

CAUTION: Never connect a single low voltage thermostat directly to more than one unit.



MULTIPLE UNIT WIRING — LINE VOLTAGE THERMOSTAT

Several units may be operated from a single line voltage thermostat by using the scheme illustrated in Figures 3 and 4. Note that all units are activated thru line voltage (115 volt) connections. The line

voltage thermostat in use, must have an ampere rating greater than the total control amp rating of all units. (This does not include the motor amps.) Control amps for XL, CXL = .2 amps all sizes.

FIG. 3. Models XL, CXL 30 thru 250 only with single stage valve and match lit pilot.

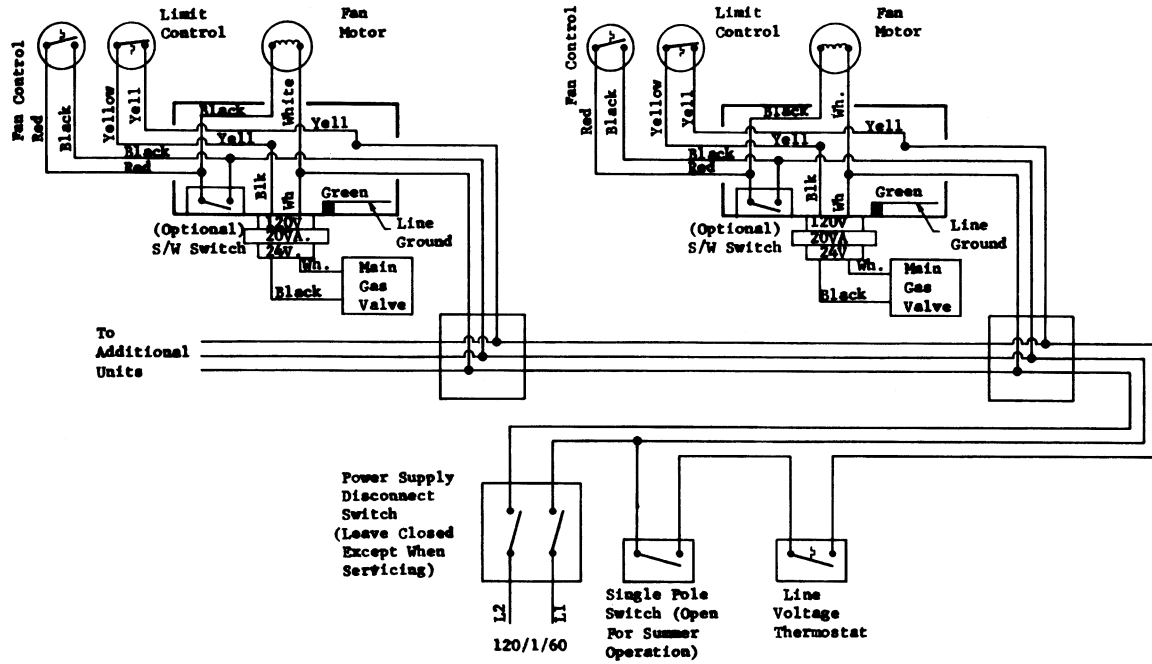


FIG. 4. Models XL, CXL 300 thru 400 only with single stage valve and match lit pilot.

