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FOR FUTURE REFERENCE**

INSTALLATION INSTRUCTIONS

G32Q3-75-9 SERIES UNITS

GAS UNITS
504,328M
9/2000

TP Technical
Publications
Litho U.S.A.

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⚠ WARNING

If the information in this manual is not followed exactly, a fire or explosion may result causing property damage, personal injury or death.



Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.

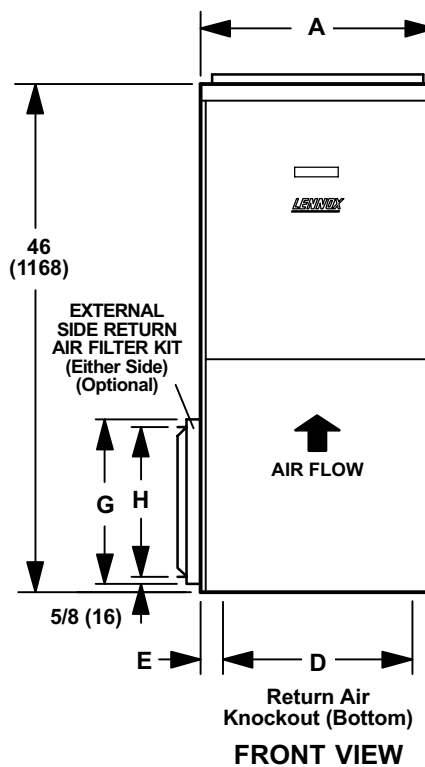
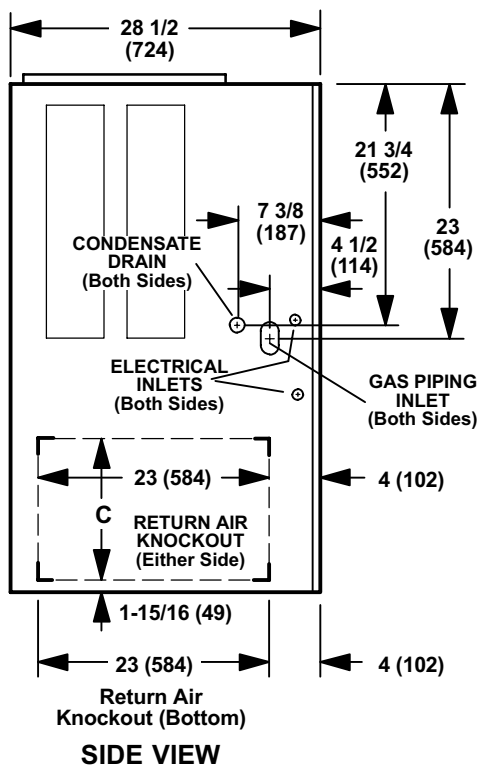
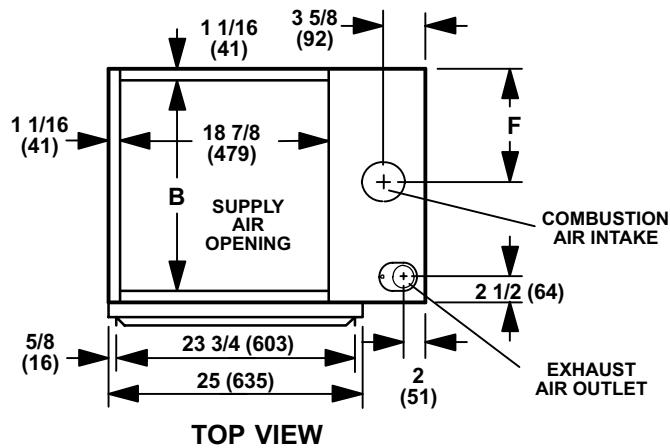
Installation and service must be performed by a qualified installer, service agency or the gas supplier.

WHAT TO DO IF YOU SMELL GAS:

- Do not try to light any appliance.
- Extinguish any open flames.
- Do not touch any electrical switch; do not use any phone in your building.
- Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
- If you cannot reach your gas supplier, call the fire department.



G32 Unit Dimensions - inches (mm)



Model No.	A		B		C		D		E		F		G		H	
	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
G32Q3-75	16-1/4	413	14-1/8	359	12	305	12	305	2-1/8	54	7-5/8	194	14	356	12-3/4	324

G32 Parts Arrangement

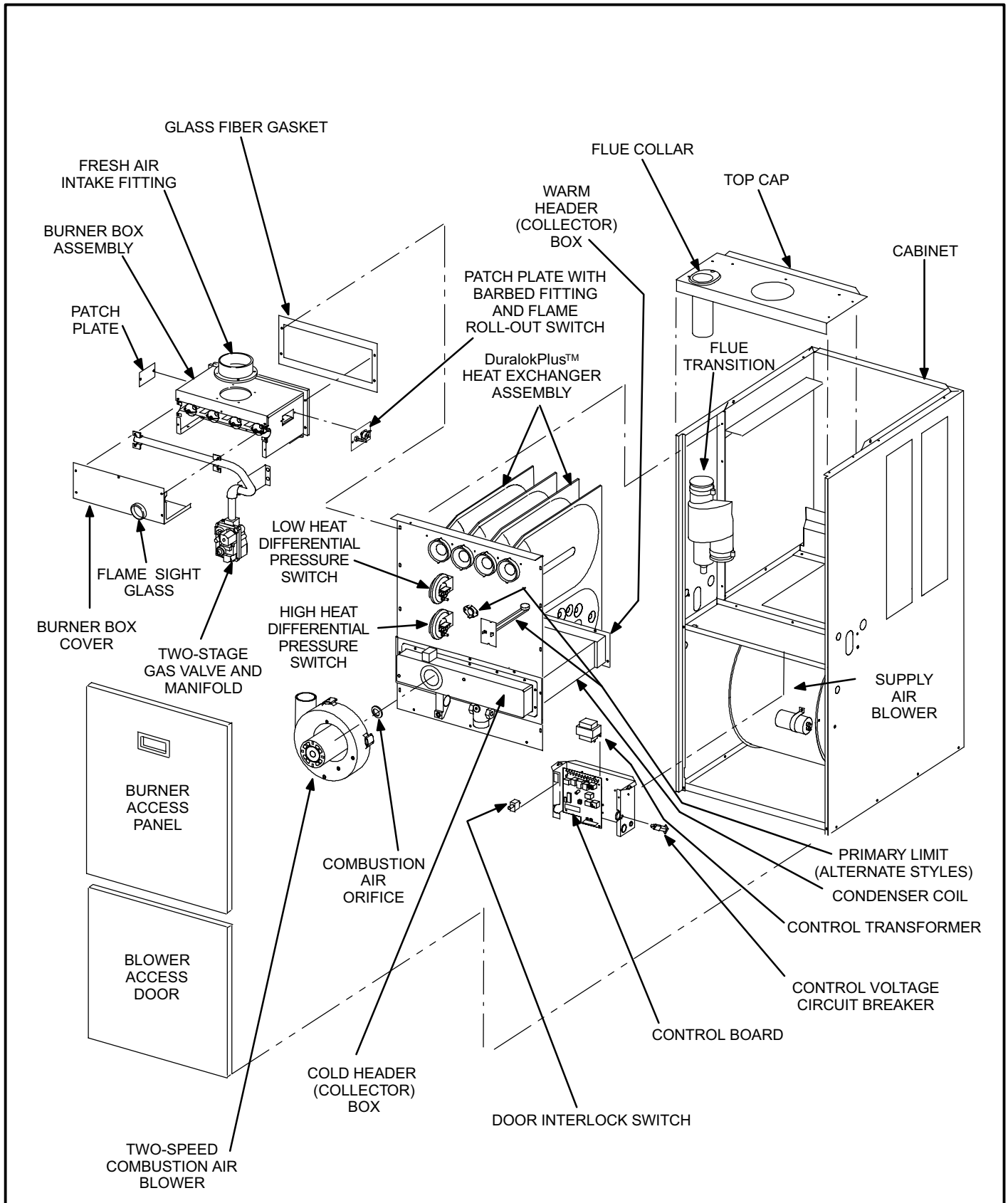


FIGURE 1

Requirements

Lennox G32 units are CSA International certified.

In the USA, installation of Lennox gas central furnaces must conform with local building codes. In the absence of local codes, units must be installed according to the current National Fuel Gas Code (ANSI-Z223.1) in the United States. The National Fuel Gas Code is available from the following address:

American National Standards Institute, Inc.
11 West 42nd Street
New York, NY 10036

In Canada, installation must conform with current National Standard of Canada CAN/CGA-B149.1 "Installation Code for Natural Gas Burning Appliances and Equipment" and CAN/CGA-B149.2 "Installation Code for Propane Gas Burning Appliances and Equipment," local plumbing or waste water codes and other applicable local codes.

This furnace is CSA International certified for installation clearances to combustible material as listed on the unit rating plate and in table 1.

TABLE 1

Clearances	Location	Inches (mm)
Service access	Front	24 (610)
	Condensate side	3 (76) (from side of unit)
To combustible materials	Top	1 (25)
	Exhaust	0
	Side, rear, and front	0
	Floor	0*

NOTE - For installation on combustible floors, the furnace shall not be installed directly on carpeting, tile, or other combustible material other than wood flooring.

Accessibility and service clearances must take precedence over fire protection clearances.

For installation in a residential garage, the furnace must be installed so that the burner(s) and the ignition source are located no less than 18 inches (457 mm) above the floor. The furnace must be located or protected to avoid physical damage by vehicles. When a furnace is installed in a public garage, hangar, or other building that has a hazardous atmosphere, the furnace must be installed according to recommended good practice requirements and current National Fuel Gas Code or CAN/CGA B149.1 and B149.2 standards.

When the furnace is used with cooling units, it shall be installed in parallel with, or on the upstream side of, cooling units to avoid condensation in the heating compartment. With a parallel flow arrangement, a damper (or other

means to control the flow of air) must adequately prevent chilled air from entering the furnace. If the damper is manually operated, it must be equipped to prevent operation of either the heating or the cooling unit, unless it is in the full "HEAT" or "COOL" setting.

When installed, the furnace must be electrically grounded according to local codes. In addition, in the United States, installation must conform with the current National Electric Code, ANSI/NFPA No. 70. The National Electric Code (ANSI/NFPA No. 70) is available from the following address:

National Fire Protection Association
1 Battery March Park
Quincy, MA 02269

In Canada, all electrical wiring and grounding for the unit must be installed according to the current regulations of the Canadian Electrical Code Part I (CSA Standard C22.1) and/or local codes.

Field wiring connections must meet or exceed specifications of type T wire and withstand a maximum temperature rise of 180°F (82°C).

G32 unit must be installed so that electrical components are protected from water.

When the furnace is installed so that supply ducts carry air circulated by the furnace to areas outside of the space containing the furnace, return air shall be handled by a duct(s) sealed to the furnace casing and terminating outside space containing furnace.

WARNING

Product contains fiberglass wool.

Disturbing the insulation in this product during installation, maintenance, or repair will expose you to fiberglass wool dust. Breathing this may cause lung cancer. (Fiberglass wool is known to the State of California to cause cancer.)

Fiberglass wool may also cause respiratory, skin, and eye irritation.

To reduce exposure to this substance or for further information, consult material safety data sheets available from address shown below, or contact your supervisor.

Lennox Industries Inc.

**P.O. Box 799900
Dallas, TX 75379-9900**

NOTE - G32 series units must not be used as a construction heater during any phase of construction. Very low return air temperatures, harmful vapors and misplacement of the filters will damage the unit and lower its efficiency.

General

The G32 is an upflow gas furnace. A changeover kit is necessary for the furnace to be able to use L.P. gas. Kit #LB-94623A (34L29) is used with the G32 furnace. These instructions are intended as a general guide and do not supersede local codes in any way. Consult authorities having jurisdiction before installation.

Shipping and Packing List

- 1 - Assembled G32 furnace
- 1 - 1/2" Condensate drain pipe
- 1 - Bag assembly containing:
 - 1 - Filter
 - 1 - External filter rack for side return air application
- 1 - Bag assembly containing:
 - 1 - Electrical make-up box
 - 1 - Wiring harness
 - 1 - Snap bushing
 - 2 - Filter clips
 - 1 - 1/2" Condensate drain fitting
 - 1 - Condensate plug
 - 1 - Brown accessory wire
 - 1 - Green ground wire
 - 4 - Wire nuts
 - 2 - Star washers and screws
 - 8 - Self-tapping screws
 - 2 - Filter door pins
 - 1 - Grounding label
 - 1 - Wire tie
 - 3 - Thread-forming screws

Shipping Damage

Check equipment for shipping damage. If you find any damage, immediately contact the last carrier.

WARNING

Improper installation, adjustment, alteration, service or maintenance can cause property damage, personal injury or loss of life. Installation and service must be performed by a qualified installer, service agency or the gas supplier.

Installation - Setting Equipment

Select a location that allows for required clearances listed on the unit rating plate. Also consider gas supply connections, electrical supply, vent connection and installation and service clearances [24 inches (610 mm) at unit front]. The furnace must be level.

NOTE - 1/3 and 1/2 hp blower motors are equipped with either four flexible mounting legs or three flexible legs and

one rigid leg. The rigid leg is equipped with a shipping bolt and a flat white plastic washer (rather than the rubber mounting grommet used with a flexible mounting leg). This shipping bolt and flat washer must be removed before the furnace is put into operation. Once the shipping bolt and washer are removed, the rigid leg will not touch the blower housing.

CAUTION

G32 unit should not be installed in areas normally subject to freezing temperatures.

Return Air Opening Guidelines

WARNING

Improper installation of unit can result in personal injury or death. Combustion and flue products must never be allowed to enter the return air system or air in the living space. Use sheet metal screws and joint tape to seal return air system to furnace.

In platform installations with furnace return, the furnace should be sealed airtight to the return air plenum. A door must never be used as a portion of the return air duct system. The base must provide a stable support and an airtight seal to the furnace. Allow absolutely no sagging, cracks, gaps, etc. For no reason should return and supply air duct systems ever be connected to or from other heat-ing devices such as a fireplace or stove, etc. Fire, explosion, carbon monoxide poisoning, personal injury and/or property damage could result.

WARNING

The blower access panel must be securely in place when the blower and burners are operating. Gas fumes, which could contain carbon monoxide, can be drawn into living space resulting in personal injury or death.

Return air can be brought in either side or at the bottom of the unit. Scribe lines show the outline of each side and the bottom return air opening.

Bottom Return Air Applications

If return air is to terminate through the floor under the furnace, a direct, airtight and sealed connection must be made to the bottom of the furnace.

- 1 - Cut opening in floor or platform. Using knockouts provided, cut bottom of base panel. See figure 2.

KNOCKOUT PATTERN FOR BOTTOM RETURN AIR APPLICATION

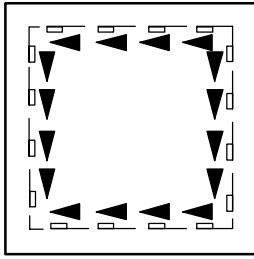


FIGURE 2

- 2 - Bend a flange on return air plenum and lower into floor or platform opening. See figure 3.
- 3 - Position unit over return air opening. Seal unit air tight with return air plenum.

BOTTOM RETURN AIR APPLICATION

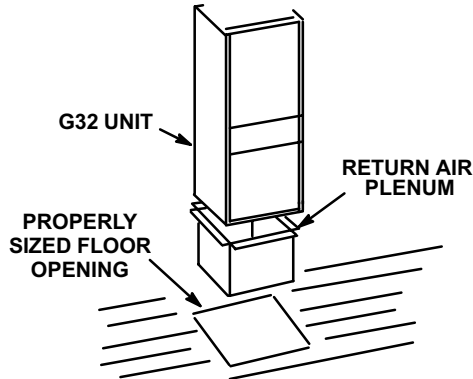


FIGURE 3

NOTE - Be careful not to damage insulation. Check for tight seal.

Side Return Air Applications

For installations where the return air is taken from a return air drop, unit may be installed using either the left or right side of furnace.

For side return air applications, cut furnace cabinet at the dimensions given on page 2. Embossed corners are provided on both cabinet sides for return air opening location.

Filter & Optional Filter Assembly

A filter and an external filter rack for use in side return air applications are shipped with the unit. A filter must be in place anytime the unit is in operation.

Bottom Return Air Applications

- 1 - Remove blower access panel.
- 2 - Install filter clips, provided with unit, by slipping folded section of clip on edge of bottom opening. See figure 4.
- 3 - Place filter in bottom of blower compartment beneath rear filter clip. Press down on filter sides. Filter clips flex allowing filter to snap into place.

- 4 - To remove filter, press clip and pull filter up and out.

BOTTOM RETURN FILTER INSTALLATION

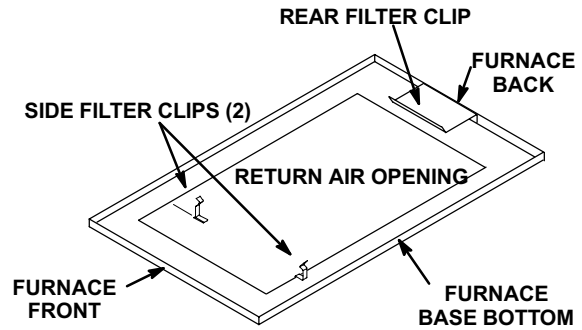


FIGURE 4

Side Return Air Applications

- 1 - Align filter rack opening with the inside edge of the side return opening. Bottom of rack should be approximately 1 inch (25 mm) from the bottom and 3 inches (76 mm) from the front of the unit.
- 2 - Secure filter rack into place with the eight self-tapping screws provided. See figure 5.

SIDE RETURN FILTER INSTALLATION

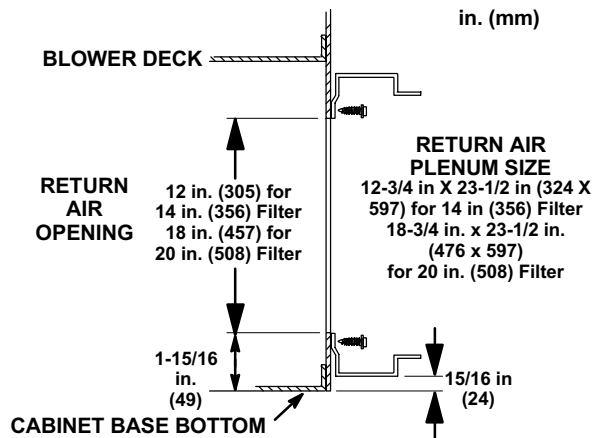


FIGURE 5

FILTER DOOR ASSEMBLY

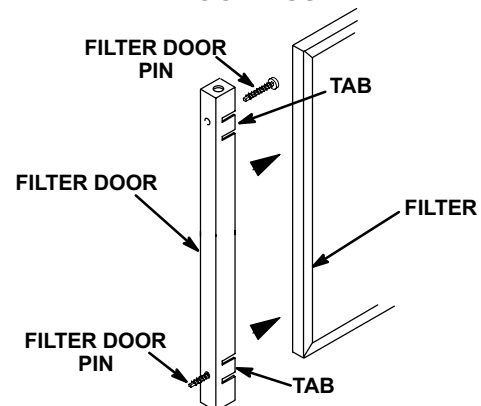


FIGURE 6

- 3 - Push filter door pins through the two holes in filter door from the inside of the u-channel. See figure 6.

- 4 - Position filter door on end of filter so that the thumb tab side of the filter door is away from the furnace. Squeeze thumb tabs to secure filter to door.
- 5 - Guide filter and filter door into the filter rack installed on side of furnace. Push door into filter rack until secure.
- 6 - To remove filter, pull filter door pins until door is released from filter rack.

Duct System

Use industry-approved standards to size and install the supply and return air duct system. This will result in a quiet and low-static system that has uniform air distribution.

Supply Air Plenum

Furnaces installed without a cooling coil require the installation of a removable access panel in the supply air duct. The access panel should be large enough to permit inspection (either by smoke or reflected light) of the heat exchanger for leaks after installation. The furnace access panel must always be in place when the furnace is operating and it must not allow leaks into the supply air duct system.

Return Air Plenum

See dimension illustration on page 2 for proper return air duct size.

NOTE - For bottom return air, return air duct should be secured to the unit using rivets or S-locks. For side return air, secure return air duct to filter rack using screws. When using screws, take care to avoid interference with the filter which may cause improper filtration.

The return air must not be drawn from a room where another gas appliance (ie., a water heater) is installed.

Even though this furnace draws its combustion air from outside of the structure, other gas appliances that share a utility room may not. When return air is drawn from a room, a negative pressure is created in the room. If a gas appliance is operating in a room with negative pressure, the flue products can be pulled back down the vent pipe and into the room. This reverse flow of the flue gas may result in incomplete combustion and the formation of carbon monoxide gas. This toxic gas might then be distributed through the house by the furnace duct system.

Pipe & Fittings Specifications

All pipe, fittings, primer and solvent cement must conform with American National Standard Institute and the American Society for Testing and Materials (ANSI/ASTM) standards. The solvent shall be free flowing and contain no lumps, undissolved particles or any foreign matter that adversely affects the joint strength or chemical resistance of the cement. The cement shall show no gelation, stratification, or separation that cannot be removed by stirring. Refer to table 2 for approved piping and fitting materials.

**TABLE 2
PIPING AND FITTINGS SPECIFICATIONS**

PIPE & FITTING MATERIAL	ASTM SPECIFICATION
Schedule 40 PVC (Pipe)	D1785
Schedule 40 PVC (Cellular Core Pipe)	F891
Schedule 40 PVC (Fittings)	D2466
Schedule 40 CPVC (Pipe)	F441
Schedule 40 CPVC (Fittings)	F438
SDR-21 PVC (Pipe) or SDR-26 PVC (Pipe)	D2241
SDR-21 CPVC (Pipe) or SDR-26 CPVC (Pipe)	F442
Schedule 40 ABS (Pipe)	D1527
Schedule 40 ABS (Fittings)	D2468
ABS-DWV (Drain Waste & Vent) (Pipe & Fittings)	D2661
PVC-DWV (Drain Waste & Vent - Pipe & Fittings)	D2665

CAUTION

Solvent cements for plastic pipe are flammable liquids and should be kept away from all sources of ignition. Do not use excessive amounts of solvent cement when making joints. Good ventilation should be maintained to reduce fire hazard and to minimize breathing of solvent vapors. Avoid contact of cement with skin and eyes.

Primers and solvents must meet ASTM specifications. PVC primer is specified in ASTM F 656. Use PVC solvent cement as specified in ASTM D 2564 and ABS solvent cement as specified in ASTM D 2235. Low temperature solvent cement is recommended. Metal or plastic strap-ping may be used for vent pipe hangers.

Table 3 lists the available exhaust termination kits. All Lennox vent terminations are PVC.

**TABLE 3
TERMINATION KITS**

Lennox Part No.	Kit LB#	Description-Inches (mm)
33K97	LB-87942	2" (50.8) Concentric Termination Kit
60L46	60L4601	3" (76.2) Concentric Termination Kit
15F75	LB-49107CC	2" (50.8) Roof Termination Kit
22G44	LB-49107CD	2" (50.8) Wall Assembly Termination Kit
15F74	LB-49107CB	2" (50.8) Wall Ring Kit
44J41	LB-65678A	3" (76.2) Roof Termination Kit
44J40	LB-65701A	3" (76.2) Wall Assembly Termination Kit
30G28	WTK	2" (50.8) Wall Termination Extended Vent
30G79	WTKX	2" (50.8) Wall Termination Extension Riser

When making ABS joints, pieces can be prepared with a cleaner. When joining ABS to PVC materials, use PVC solvent cement. Refer to this procedure as specified in ASTM D3138.

Vent Piping Guidelines

Pipe used for exhaust and intake lines should be sized according to table 4. Note that maximum length of vent pipe is for one run; either intake or exhaust. Maximum vent length given is **not** the total length of intake + exhaust vents.

Each 90° elbow is equivalent to 5 feet (1.52 m) of vent pipe. Two 45° elbows are equivalent to one 90° elbow. One 45° elbow is equal to 2.5 feet (.76 m) of vent pipe.

If intake and exhaust piping runs are not equal in length and number of elbows, the larger diameter pipe must be used for both runs.

TABLE 4
VENT PIPE SIZING TABLE FOR G32 FURNACES
MINIMUM DIAMETER OF INTAKE/EXHAUST PIPE

Vent Pipe Equivalent Length Max. Feet (Meters)	G32-75 75,000 BTU
15 (4.57 m)	2"
20 (6.10 m)	2"
25 (7.62 m)	2"
30 (9.14 m)	2"
40 (12.19 m)	2"
50 (15.24 m)	2"
55 (16.76 m)	2"
60 (18.29 m)	3"
70 (21.34 m)	3"
80 (24.38 m)	3"
90 (27.43 m)	3"
100 (30.48 m)	3"
110 (33.53 m)	3"
120 (36.58 m)	3"
130 (39.62 m)	3"

NOTE - Min. pipe for G32-75 is 5 feet and 2 elbows of 2 inch diameter pipe.

NOTE - When you install a WTKX termination kit (30G79) as part of the intake and exhaust piping, add twelve feet to your equivalent length (the two 2 inch diameter 90° elbows and the 27 inch pipe in the kit).

G32Q3-75 units are equipped with connections for 2-inch diameter venting. This should satisfy most venting requirements. No transition pieces are provided or needed for 2-inch venting.

Joint Cementing Procedure

All cementing of joints should be done according to the specifications outlined in ASTM D 2855.

WARNING

DANGER OF EXPLOSION! Fumes from PVC glue may ignite during system check. Disconnect wire from pressure switch terminal before 115 volt power is applied to unit. Reconnect wire after two minutes of combustion air blower operation.

- 1 - Measure and cut vent pipe to desired length.
- 2 - Debur and chamfer end of pipe, removing any ridges or rough edges. If end is not chamfered, edge of pipe may remove cement from fitting socket and result in a leaking joint.
- 3 - Clean and dry surfaces to be joined.
- 4 - Test fit joint and mark depth of fitting on outside of pipe.
- 5 - Uniformly apply liberal coat of PVC primer for PVC or ABS cleaner for ABS to inside socket surface of fitting and male end of pipe to depth of fitting socket.
- 6 - Promptly apply solvent cement to end of pipe and inside socket surface of fitting. Cement should be applied lightly but uniformly to inside of socket. Take care to keep excess cement out of socket. Apply second coat to end of pipe.

NOTE - Time is critical at this stage. Do not allow primer to dry before applying cement.

- 7 - Immediately after applying last coat of cement to pipe, and while both inside socket surface and end of pipe are wet with cement, forcefully insert end of pipe into socket until it bottoms out. Turn pipe 1/4 turn during assembly (but not after pipe is fully inserted) to distribute cement evenly.

NOTE - Assembly should be completed within 20 seconds after last application of cement. Hammer blows should not be used when inserting pipe.

- 8 - After assembly, wipe excess cement from pipe at end of fitting socket. A properly made joint will show a bead around its entire perimeter. Any gaps may indicate a defective assembly due to insufficient sol-vent.
- 9 - Handle joints carefully until completely set.

Venting Practices

The thickness of construction through which vent/air intake pipes may be installed is a minimum of 3 inches (76 mm) and a maximum of 24 inches (610 mm). If a G32 furnace replaces a furnace which was commonly vented with another gas appliance, the size of the existing vent pipe for that gas appliance must be checked. Without the heat of the original furnace flue products, the existing vent pipe is probably oversized for the single water heater or other appliance. The vent should be checked for proper draw with the remaining appliance.

Intake Piping

- 1 - Cement intake piping in slip connector located at top of unit.
- 2 - Route piping to outside of structure. Continue with installation following instructions given in exhaust and intake piping termination section.

WARNING

Insufficient combustion air can cause headaches, nausea, dizziness or asphyxiation. It will also cause excess water in the heat exchanger resulting in rusting and premature heat exchanger fail-ure. Excessive exposure to contaminated combustion air will result in safety and performance related problems. Avoid exposure to the follow-ing substances in the combustion air supply:

Permanent wave solutions
Chlorinated waxes and cleaners
Chlorine base swimming pool chemicals
Water softening chemicals
De-icing salts or chemicals
Carbon tetrachloride
Halogen type refrigerants
Cleaning solvents (such as perchloroethylene)
Printing inks, paint removers, varnishes, etc.
Hydrochloric acid
Cements and glues
Antistatic fabric softeners for clothes dryers
Masonry acid washing materials

Exhaust Piping

- 1 - Cement exhaust piping into flue collar socket located on the left side of the top cap.
- 2 - All horizontal runs of exhaust pipe must slope back toward the unit. A minimum of 1/4 inch (6 mm) drop for each 12 inches (305 mm) of horizontal run is mandatory for drainage. Horizontal runs of exhaust piping must be supported every 5 feet (1.52 m) using hangers.

NOTE - Exhaust piping should be checked carefully to make sure there are no sags or low spots.

NOTE - Exhaust piping must be insulated with 1/2 inch (13 mm) Armaflex or equivalent when run through unheated space. Do not leave any area of exhaust pipe open to outside air; exterior exhaust must be insulated with 1/2 inch (13 mm) Armaflex or equivalent.

CAUTION

Do not discharge exhaust into an existing stack or stack that also serves another gas appliance. If vertical discharge through an existing unused stack is required, insert PVC pipe inside the stack until the end is even with the top or outlet end of the metal stack.

CAUTION

The exhaust vent pipe operates under positive pressure and must be completely sealed to pre-vent leakage of combustion products into the living space.

Removal of Unit from Common Venting System

In the event that an existing furnace is removed from a venting system commonly run with separate gas appliances, the venting system may be too large to properly vent the remaining attached appliances. The following test should be conducted while all appliances (both in operation and those not in operation) are connected to the common venting system. If the venting system has been installed improperly, corrections must be made as outlined in the previous section.

- 1 - Seal any unused openings in the common venting system.
- 2 - Visually inspect the venting system for proper size and horizontal pitch and determine there is no blockage or restriction, leakage, corrosion or other deficiencies which could cause an unsafe condition.
- 3 - To the extent that it is practical, close all building doors and windows, and all doors between the space in which the appliances remaining connected to the common venting system are located and other spaces of the building. Turn on clothes dryers and any appliances not connected to the common venting system. Turn on any exhaust fans, such as range hoods and bathroom exhausts, so they will operate at maximum speed. Do not operate a summer exhaust fan. Close fireplace dampers.
- 4 - Follow the lighting instructions. Place the appliance being inspected in operation. Adjust thermostat so appliance will operate continuously.
- 5 - Test for spillage at the draft hood relief opening after 5 minutes of main burner operation. Use the flame of match or candle, or smoke from a cigarette or cigar, or a draft gauge.
- 6 - After determining that each appliance remaining connected to the common venting system properly vents when tested as indicated in step 3, return doors, windows, exhaust fans, fireplace dampers and any other gas-burning appliance to their previous condition of use.
- 7 - If improper venting is observed during any of the above tests, the common venting system must be corrected. The common venting system should be re-sized to approach the minimum size as determined by using the appropriate tables in appendix G in the current standards of the National Fuel Gas Code ANSI Z223-1 in the USA, and the appropriate Category 1 Natural Gas appliances venting sizing tables in the current standard of the CAN/CGA-B149.1 in the Natural Gas Installation Code in Canada.

Intake and Exhaust Piping Terminations

Intake and exhaust pipes may be routed either horizontally through an outside wall or vertically through the roof. In attic or closet installations, vertical termination through the roof is preferred. Figures 7 through 19 show typical terminations.

- 1 - Use recommended piping materials for both intake and exhaust piping.
- 2 - Secure all joints, including drain leg, gas tight using approved cement.
- 3 - Piping diameters should be determined according to length of pipe run. See table 4. Locate intake piping upwind (prevailing wind) from exhaust piping. To avoid recirculation of exhaust gas on roof terminations, end of exhaust pipe must be higher than intake pipe.

Exhaust and intake exits must be in same pressure zone. Do not exit one through the roof and one on the side. Also, do not exit the intake on one side and the exhaust on another side of the house or structure.

- 4 - Intake and exhaust pipes should be placed as close together as possible at termination end (refer to illustrations). Maximum separation is 3 inches (76 mm) on roof terminations and 6 inches (152 mm) on side wall terminations.
- 5 - Exhaust piping must terminate straight out or up as shown. In rooftop applications, a 2 inch X 1 1/2 inch reducer for 2 inch venting, 3 inch x 2 inch reducer for 3 inch venting must be used on the exhaust piping at the point where it exits the structure to improve the velocity of exhaust away from the intake piping.

On roof terminations, the intake piping should terminate straight down using two 90° elbows. See figure 7.

⚠ IMPORTANT

Do not use screens or perforated metal in intake and exhaust terminations. Doing so will cause freeze-ups and may block the terminations.

NOTE - If winter design temperature is below 32° F (0°C), exhaust piping must be insulated with 1/2 inch (13 mm), Armaflex or equivalent when run through unheated space. Do not leave any surface area of exhaust pipe open to outside air; exterior exhaust pipe must be insulated with 1/2 inch (13 mm) Armaflex or equivalent. In extreme cold climate areas, 3/4 inch (19 mm) Armaflex or equivalent is recommended. Insulation on outside runs of exhaust pipe must be painted or wrapped to protect insulation from deterioration.

NOTE - During extremely cold temperatures, below approximately 20°F (6.7°C), units with long runs of vent pipe through unconditioned space, even when insulated, may form ice in the exhaust termination that prevents the unit from operating properly. Longer run times of at least 5 minutes will alleviate most icing problems. Also, a heating cable may be installed on exhaust piping and termination to prevent freeze-ups. Heating cable installation kit is available from Lennox. See Condensate Piping section for part numbers.

NOTE - Care must be taken to avoid recirculation of exhaust back into intake pipe.

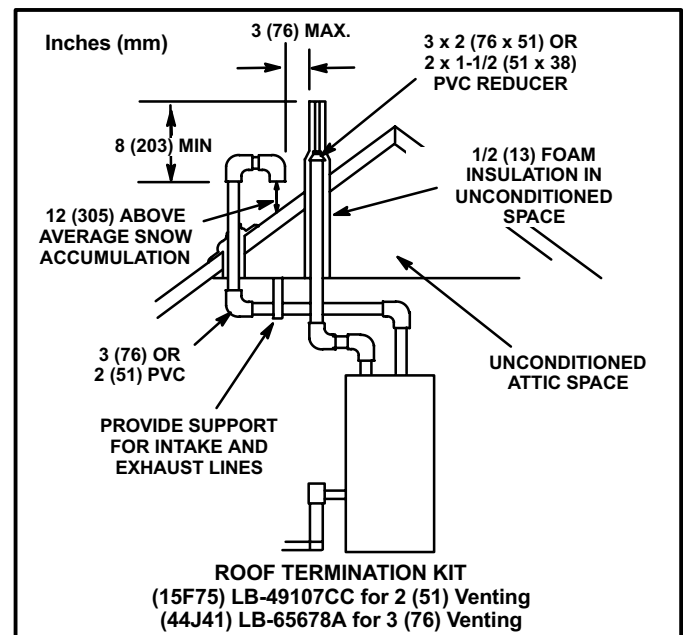


FIGURE 7

- 6 - On field-supplied terminations for side wall exits, exhaust piping should extend a maximum of 12 inches (305 mm) beyond the outside wall. Intake piping should be as short as possible. See figure 8.

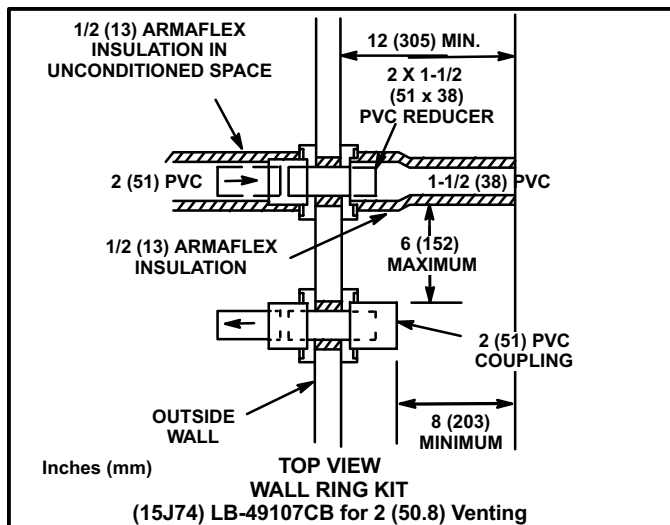


FIGURE 8

- 7 - On field-supplied terminations, a minimum separation distance between the end of the exhaust pipe and the end of the intake pipe is 8 inches (203 mm).
- 8 - If intake and exhaust piping must be run up a side wall to position above snow accumulation or other obstructions, the piping must be supported every 3 feet (.91 m) as shown in figure 14. Refer to figures 12 and 13 for proper piping method. WTK wall termination kit must be extended for use in this application. See figure 17 or use kit WTKX shown in figure 18. When exhaust and intake piping must be run up an outside wall, the exhaust piping is reduced to 1 1/2 inches (38 mm) after the final elbow. The intake piping may be equipped with a 90° elbow turndown. Using turn-down will add 5 feet (1.5 m) to the equivalent length of the pipe.

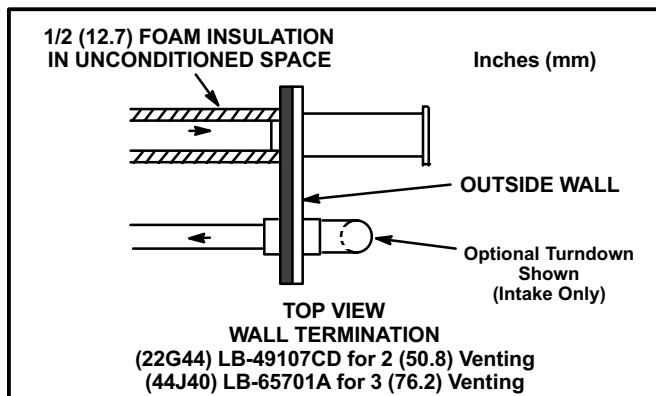


FIGURE 9

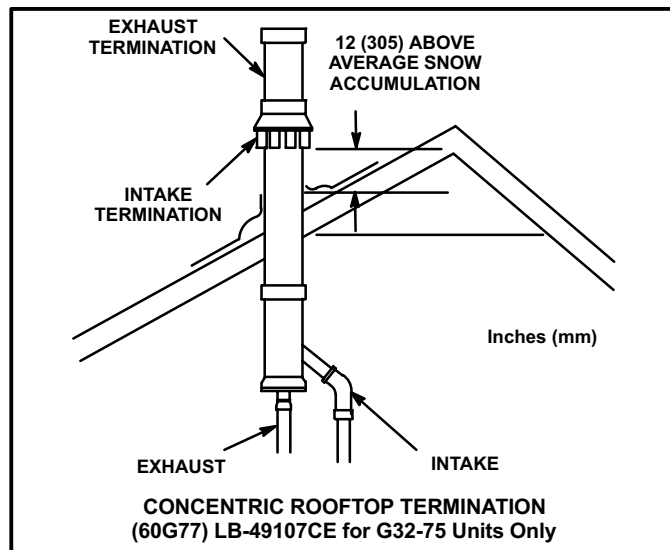


FIGURE 10

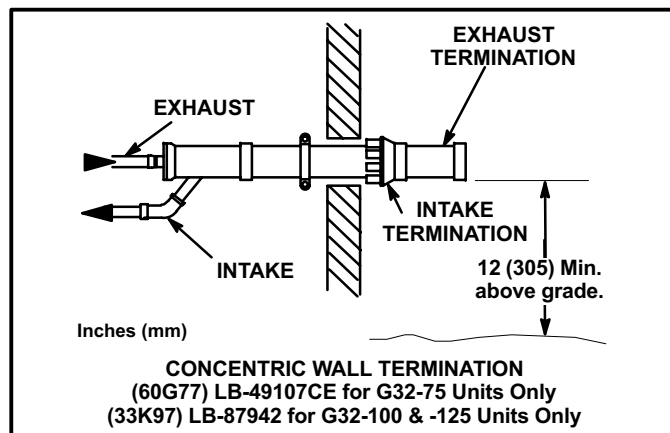


FIGURE 11

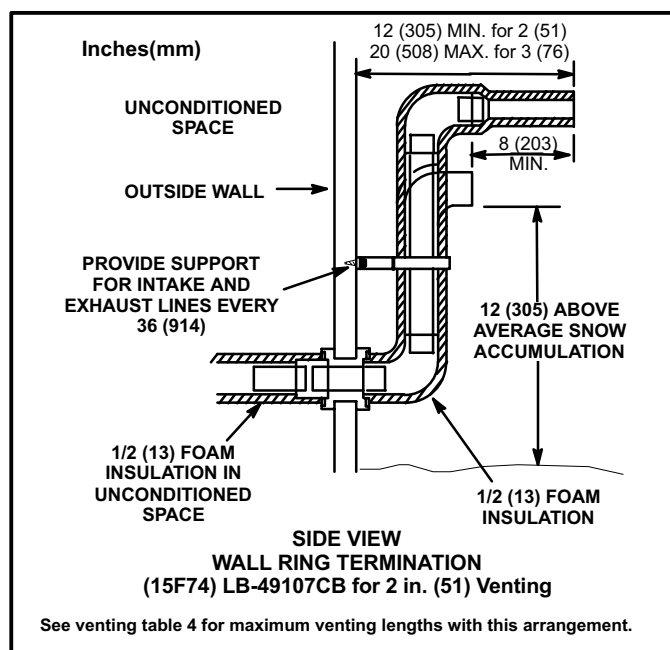


FIGURE 12

9 - Position termination ends so they are free from any obstructions and above the level of snow accumulation (where applicable). Termination ends must be a minimum of 12 inches (305 mm) above grade level. Do not point into window wells, stairwells, alcoves, courtyard areas or other recessed areas. Do not position termination ends directly below roof eaves or above a walkway. Since the G32 is a certified direct vent, Category IV gas furnace, the location of the termination is limited by local building codes. In the absence of local codes, refer to the current National Fuel Gas Code ANSI Z223-1 in USA, and current standard CAN/CGA-B149.1 of the Natural Gas Installation Instructions in Canada for details. The termination should be at least 12 inches (305 mm) from any opening through which flue products could enter the building.

When horizontally vented, minimum clearance for termination from electric meters, gas meters, regulators and relief equipment is 4 feet (1.2 m) for US installations. Refer to the current CAN/CGA-B149.1 for installations in Canada or with authorities having local jurisdiction.

At vent termination, care must be taken to maintain protective coatings over building materials (prolonged exposure to exhaust condensate can destroy protective coatings). It is recommended that the exhaust outlet not be located within 6 feet (1.8 m) of a condensing unit because the condensate can damage the painted coating.

⚠ IMPORTANT

Combustion air intake inlet and exhaust outlet should not be located within 6 feet (1.8 m) of dryer vent or combustion air inlet or outlet of another appliance. Piping should not exit less than 3 feet (.91 m) from opening into another building.

⚠ IMPORTANT

For Canadian Installations Only:
In accordance to CAN/CGA-B149.1 and .2, the minimum allowed distance between the combustion air intake inlet and the exhaust outlet of other appliances shall not be less than 12 inches (305 mm).

- 10 - Suspend piping using hangers at a minimum of every 5 feet (1.52 m) for schedule 40 PVC and every 3 feet (.91 m) for ABS-DWV, PVC-DWV, SDR-21 PVC, and SDR-26 PVC piping. A suitable hanger can be fabricated by using metal or plastic strapping or a large wire tie.
- 11 - In areas where piping penetrates joists or interior walls, hole must be large enough to allow clearance on all sides of pipe as it passes through the center of the hole.
- 12 - Isolate piping at the point where it exits the outside wall or roof.
- 13 - When furnace is installed in a residence where unit is shut down for an extended period of time, such as a vacation home, make provisions for draining condensate collection trap and lines.

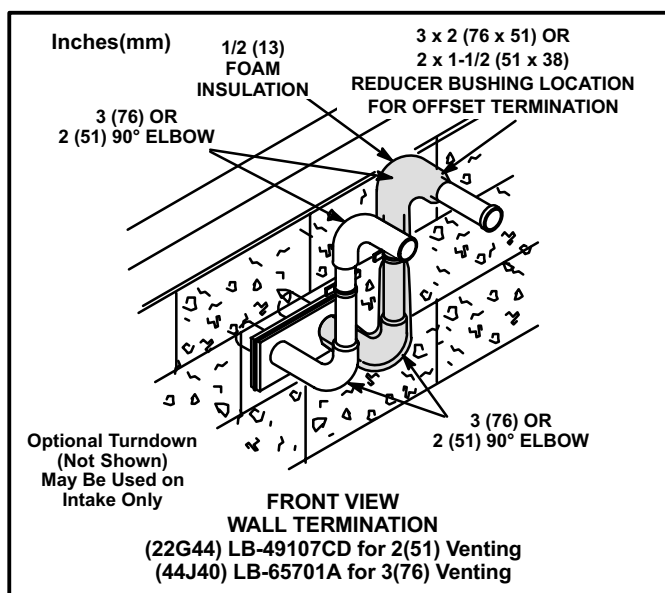


FIGURE 13

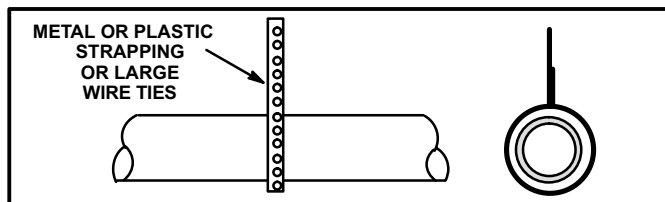


FIGURE 14

- 14 - Based on the recommendation of the manufacturer, a multiple furnace installation may use a group of up to four termination kits WTK assembled together horizontally, as shown in figure 16.

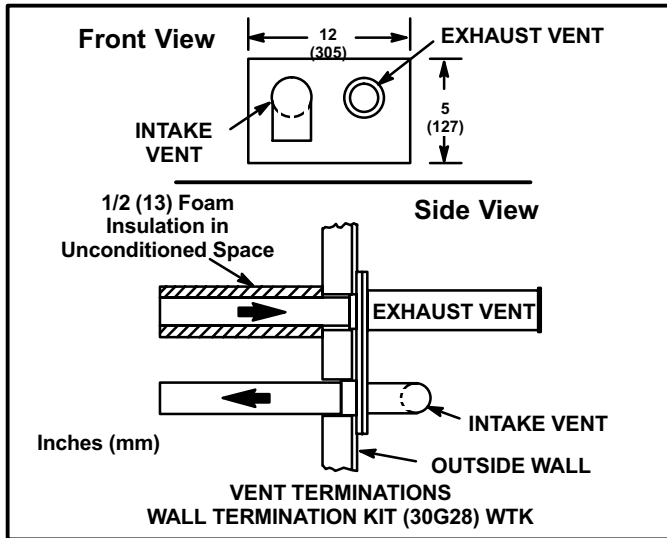


FIGURE 15

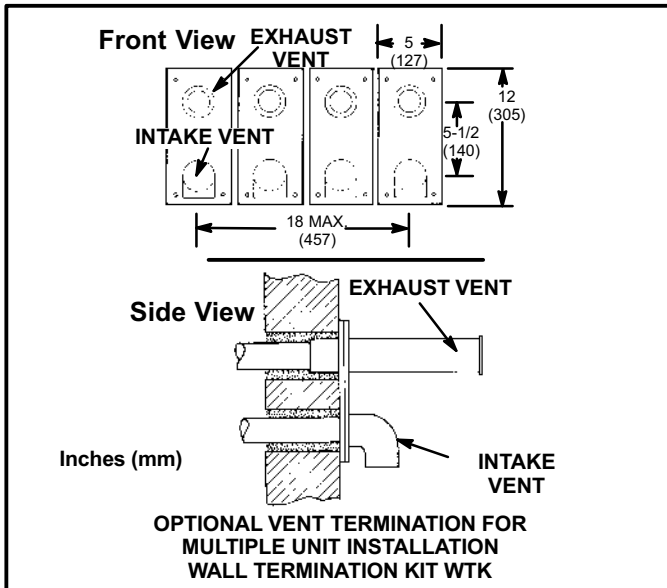


FIGURE 16

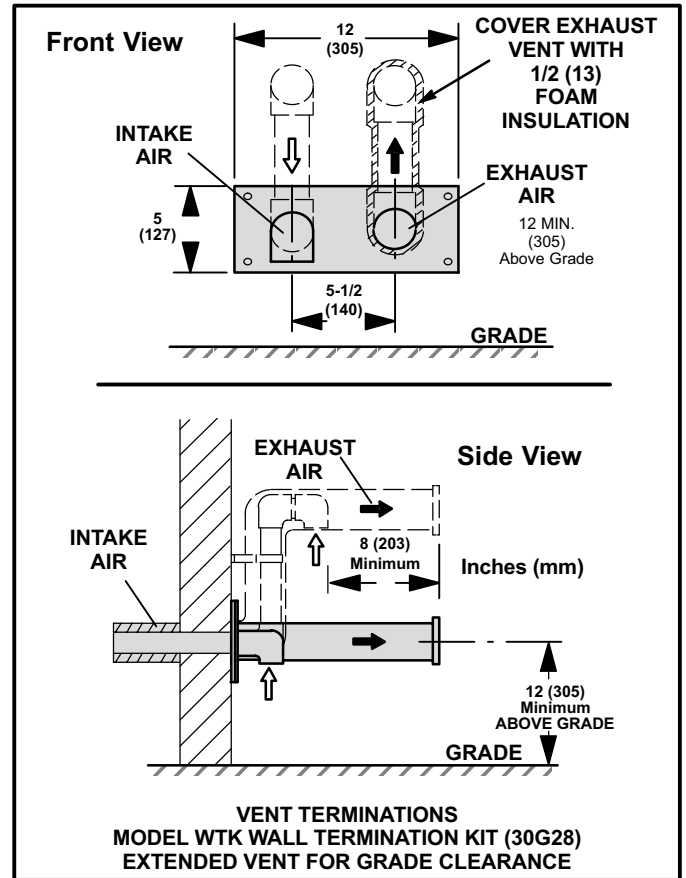


FIGURE 17

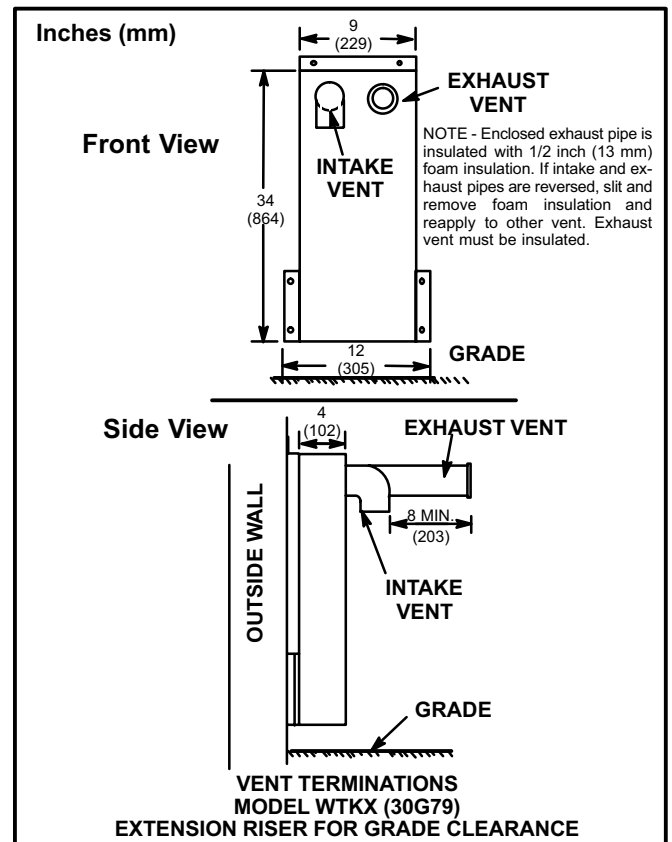
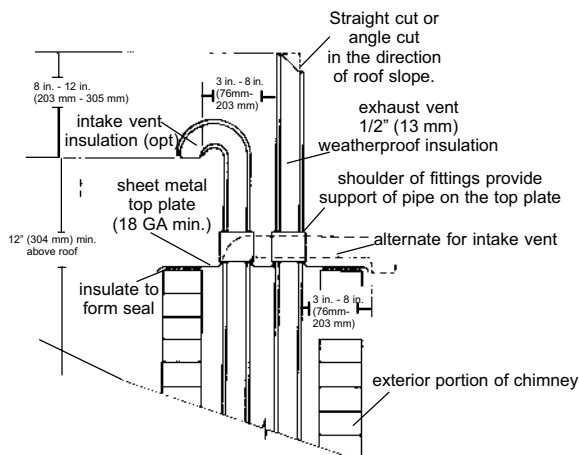


FIGURE 18

G32 VENTING IN EXISTING CHIMNEY



NOTE - Do not discharge exhaust gases directly into any chimney or vent stack. If vertical discharge through an existing unused chimney or stack is required, insert piping inside chimney until the pipe open end is above top of chimney and terminate as illustrated. In any exterior portion of chimney, the exhaust vent must be insulated. An alternate method is to fill the chimney with vermiculite or equal to take advantage of its acoustic and thermal properties.

FIGURE 19

Condensate Piping

This unit is designed for either right- or left-side exit of condensate piping. Route the condensate drainline only within the conditioned space: this prevents possible freezing of the condensate, which would block the drain-line. Use an electric heat cable if you route the condensate line through unconditioned areas.

CAUTION

Do not use copper tubing or existing copper condensate lines for drain line.

- 1 - Determine which side condensate will exit the unit.
- 2 - Connect 1/2 inch (13 mm) plastic pipe plug (provided) in the unused end of the condensate trap. Install plug so that it is sealed water tight yet able to be removed. Do not permanently seal the connection. Teflon tape is recommended to seal joint. See figure 20.

CONDENSATE ASSEMBLY

(For left or right installation)

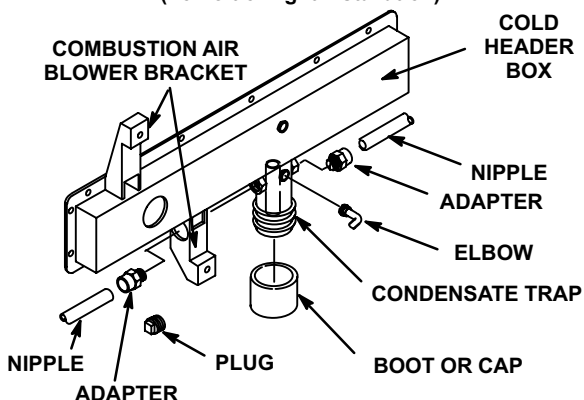


FIGURE 20

- 3 - Use the provided adapter (1/2 inch PVC x 1/2 inch

MPT) and the nipple (1/2 inch PVC) to carry drainage outside the cabinet. If a field substitute is needed, 1/2 inch CPVC x 1/2 inch MPT adapter and 1/2 inch CPVC is acceptable for use.

- 4 - Glue nipple to the adapter using the procedures outlined in the "Joint Cementing Procedures" section. The nipple/adapter assembly should be connected in a non-permanent manner and must be water tight. Teflon tape is recommended to seal the joint.

For Right-Hand Side Condensate Exit:

Install the nipple/adapter assembly from the outside of the cabinet and insert the adapter into the threaded opening in the condensate trap.

For Left-Hand Side Condensate Exit:

Insert nipple/adapter assembly from the left hand side of the cabinet and through the combustion air blower mounting structure into the threaded opening in the condensate trap.

- 5 - Connect field-supplied plumbing to nipple and route to open drain. Plumbing should be vented to a point higher than the condensing coil. See figure 21.

CONDENSATE PLUMBING

(Plumbing must be vented higher than coil.)

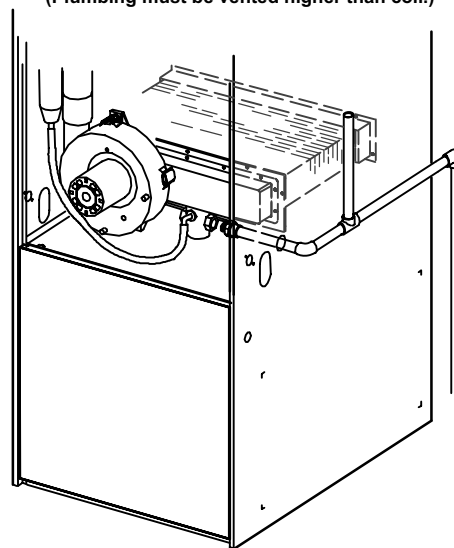


FIGURE 21

- 6 - Connect condensate drain line (1/2 inch [13 mm] SDR 11 plastic pipe or tubing) to condensate connection on condensate trap assembly and route to open drain. Condensate line must be sloped downward away from drip leg to drain. If the drain level is above condensate outlet, use a condensate pump to pump the condensate to the higher level. Condensate drain line should be routed within the conditioned space to avoid freezing of condensate and blockage of drain line. If this is not possible, a heat cable kit may be used on the condensate line. Heating cable kit is available from Lennox in various lengths; 6 feet (1.8 m) - kit no. 18K48; 24 feet (7.3 m) - kit no. 18K49; and 50 feet (15.2 m) - kit no. 18K50.

Gas Piping

⚠ CAUTION

If a flexible gas connector is required or allowed by the authority that has jurisdiction, black iron pipe shall be installed at the gas valve and extend outside the furnace cabinet.

- 1 - Gas piping may be routed into the unit through either the left- or right-hand side. Supply piping enters into the gas valve from the bottom of the valve as shown in figure 23.
- 2 - When connecting the gas supply, factors such as length of run, number of fittings and furnace rating must be considered to avoid excessive pressure drop. Table 5 lists recommended pipe sizes for typical applications.
NOTE - Use two wrenches when connecting gas piping to avoid transferring torque to the manifold.
- 3 - The gas piping must not run in or through air ducts, clothes chutes, gas vents or chimneys, dumb waiters or elevator shafts. Center gas line through piping hole. Gas line should not touch side of unit. When left-hand gas plumbing is required, gas line should be installed in the lower half of knockout so that piping will clear combustion air blower. See figure 23.
- 4 - The piping should be sloped 1/4 inch (6.4 mm) per 15 feet (4.57 m) upward toward the meter from the furnace. The piping must be supported at proper intervals [every 8 to 10 feet (2.44 to 3.01 m)] using suitable hangers or straps. A drip leg should be installed in vertical pipe runs to the unit.
- 5 - Some local codes may require installation of a manual main shut-off valve and union (furnished by the installer) external to the unit. Union must be of the ground joint type.

NOTE - Install a 1/8 inch NPT plugged tap in the field piping upstream of the gas supply connection to the unit. The tap must be accessible for test gauge connection. See figure 24.

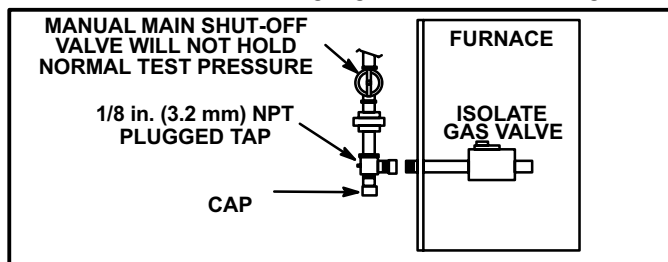


FIGURE 22

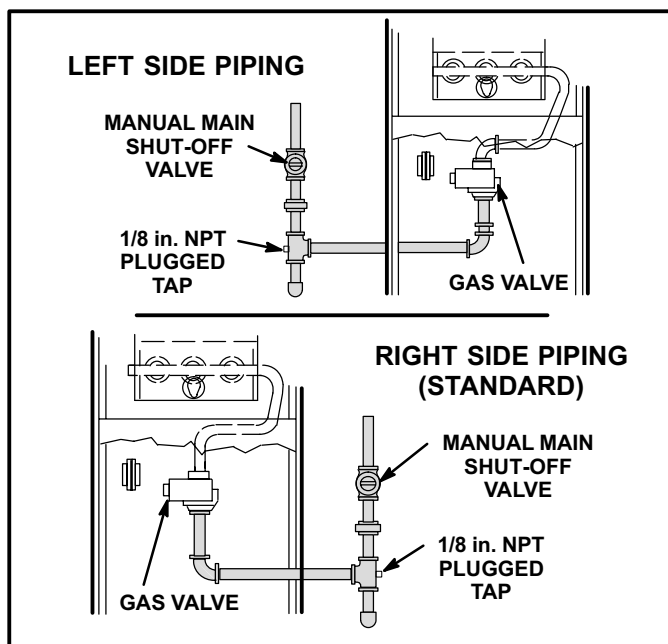


FIGURE 23

TABLE 5
GAS PIPE CAPACITY - ft.³/hr (m³/hr)

Nominal Iron Pipe Size -Inches(mm)	Internal Diameter -Inches(mm)	Length of Pipe-Feet (m)									
		10 (3.048)	20 (6.096)	30 (9.144)	40 (12.192)	50 (15.240)	60 (18.288)	70 (21.336)	80 (24.384)	90 (27.432)	100 (30.480)
1/4 (6.35)	.364 (9.246)	43 (1.13)	29 (.82)	24 (.68)	20 (.57)	18 (.51)	16 (.45)	15 (.42)	14 (.40)	13 (.37)	12 (.34)
3/8 (9.53)	.493 (12.522)	95 (2.69)	65 (1.84)	52 (1.47)	45 (1.27)	40 (1.13)	36 (1.02)	33 (.73)	31 (.88)	29 (.82)	27 (.76)
1/2 (12.7)	.622 (17.799)	175 (4.96)	120 (3.40)	97 (2.75)	82 (2.32)	73 (2.07)	66 (1.87)	61 (1.73)	57 (1.61)	53 (1.50)	50 (1.42)
3/4 (19.05)	.824 (20.930)	360 (10.19)	250 (7.08)	200 (5.66)	170 (4.81)	151 (4.28)	138 (3.91)	125 (3.54)	118 (3.34)	110 (3.11)	103 (2.92)
1 (25.4)	1.049 (26.645)	680 (19.25)	465 (13.17)	375 (10.62)	320 (9.06)	285 (8.07)	260 (7.36)	240 (6.80)	220 (6.23)	205 (5.80)	195 (5.52)
1-1/4 (31.75)	1.380 (35.052)	1400 (39.64)	950 (26.90)	770 (21.80)	660 (18.69)	580 (16.42)	530 (15.01)	490 (13.87)	460 (13.03)	430 (12.18)	400 (11.33)
1-1/2 (38.1)	1.610 (40.894)	2100 (59.46)	1400 (41.34)	1180 (33.41)	990 (28.03)	900 (25.48)	810 (22.94)	750 (21.24)	690 (19.54)	650 (18.41)	620 (17.56)
2 (50.8)	2.067 (52.502)	3950 (111.85)	2750 (77.87)	2200 (62.30)	1900 (53.80)	1680 (47.57)	1520 (43.04)	1400 (39.64)	1300 (36.81)	1220 (34.55)	1150 (32.56)
2-1/2 (63.5)	2.469 (67.713)	6300 (178.39)	4350 (123.17)	3520 (99.67)	3000 (84.95)	2650 (75.04)	2400 (67.96)	2250 (63.71)	2050 (58.05)	1950 (55.22)	1850 (52.38)
3 (76.2)	3.068 (77.927)	11000 (311.48)	7700 (218.03)	6250 (176.98)	5300 (150.07)	4750 (134.50)	4300 (121.76)	3900 (110.43)	3700 (104.77)	3450 (97.69)	3250 (92.03)
4 (101.6)	4.026 (102.260)	23000 (651.27)	15800 (447.39)	12800 (362.44)	10900 (308.64)	9700 (274.67)	8800 (249.18)	8100 (229.36)	7500 (212.37)	7200 (203.88)	6700 (189.72)

NOTE - Capacity given in cubic feet (m³) of gas per hour and based on 0.60 specific gravity gas.

Leak Check

After gas piping is completed, carefully check all piping connections (factory- and field-installed) for gas leaks. Use a leak detecting solution or other preferred means.

⚠ 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 to check for gas leaks.

⚠ IMPORTANT

The furnace must be isolated from the gas supply piping system by closing its individual manual shut-off valve during any pressure testing of the gas supply piping system at test pressures equal to or less than 1/2 psig (3.45 kPa). See figure 22.

The furnace and its individual shut-off valve must be disconnected from the gas supply piping system during any pressure testing of the system at test pressures greater than 1/2 psig (3.45 kPa).

Electrical

A field make-up box is provided for line voltage wiring. Line voltage wiring to unit is done through the J69 jack from the field make-up box to plug P69 from the control box. See figures 25 and 26 for make-up box installation.

Figure 27 shows thermostat designations for identification purposes. Refer to figure 28 for a detail of the integrated control, figure 30 for schematic wiring diagram and troubleshoot- ing, and figure 29 for point-to-point field wiring.

ELECTROSTATIC DISCHARGE (ESD) Precautions and Procedures

⚠ CAUTION

Electrostatic discharge can affect electronic components. Take precautions during furnace installation and service to protect the furnace's electronic controls. Precautions will help to avoid control exposure to electrostatic discharge by putting the furnace, the control and the technician at the same electrostatic potential. Neutralize electrostatic charge by touching hand and all tools on an unpainted unit surface, such as the gas valve or blower deck, before performing any service procedure.

- 1 - Install field make-up box on either side, inside or out of the cabinet. Knockouts are provided in box and cabinet to run wiring. See figures 25 and 26.
- 2 - Remove cap from knockout in blower deck on the same side as the installed make-up box.

⚠ IMPORTANT

Ignition control will not operate unless unit is properly grounded. 120V supply must be installed with correct polarity.

- 3 - Electrically ground unit in accordance with local codes or, in the absence of local codes, in accordance with the current National Electric Code (ANSI/NFPA No. 70) and in Canada with the current Canadian Electric Code part 1 (CSA standard C22.1). The ground wire is provided in the field make-up box.

To ensure proper grounding of the furnace, two star washers are included in the electrical make-up box bag assembly. Place the star washer on securing screw before installing the make-up box. Make sure the star washer breaks the paint on the cabinet so that the washer is touching metal. Unit is not properly grounded if paint has not been removed by star washer.

- 4 - An optional 120 volt accessory wire is provided with G32 units. Install the brown accessory wire into J69 jack plug by inserting the pin of the brown wire into the open socket of the jack. See figure 24. Any accessory rated up to 1 amp can be connected to this wire. Connect the neutral leg of the accessory to the neutral white wire in the make-up box. The accessory terminal is energized whenever the blower is in operation.

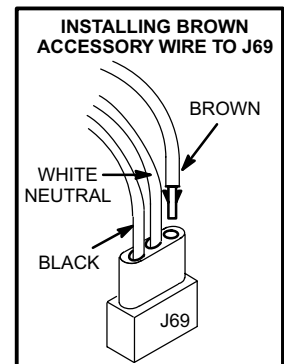


FIGURE 24

- 5 - Insert the three-pin (P69) plug from the control box into the knockout provided in the blower deck.
- 6 - Connect jack (J69) from make-up box to jack plug in blower deck.
- 7 - Select wire size according to the blower motor amps.
- 8 - Snaphole bushing is provided for the wiring entry hole in the cabinet. A snaphole plug is provided to seal the unused wire entry hole

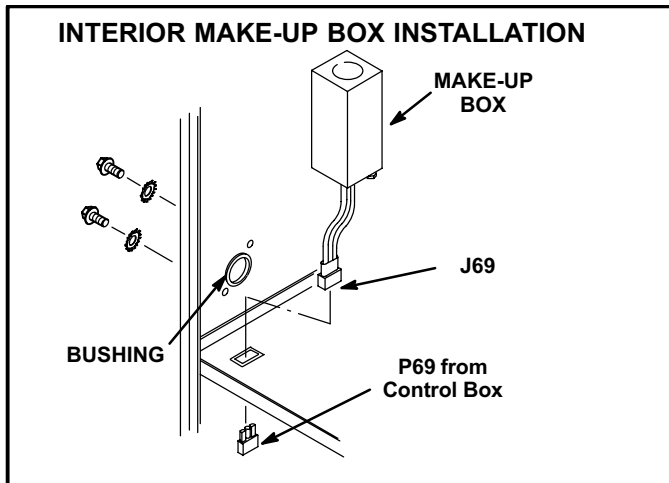


FIGURE 25

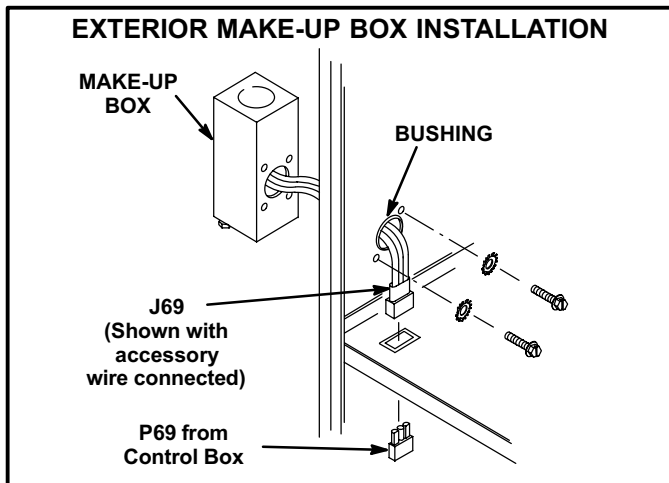


FIGURE 26

- 9 - Install room thermostat according to instructions provided with thermostat. See figure 27 for thermostat terminal designations. If furnace is being used with heat pump refer to FM21 installation instruction.

NOTE - W2 thermostat connection must be made at W2 on the control board.

- 10 - Install a separate disconnect switch near the unit so power can be turned off for servicing.

- 11 - Complete wiring connections to equipment using wiring diagrams provided with unit and in figures 29 and 30. Use 18-gauge wire or larger for thermostat connections.

- 12 - The integrated board controls first- and second-stage furnace operation providing maximum comfort and efficiency. The furnace may be controlled by either a single- or two-stage room thermostat.

- 13 - Check the placement of the thermostat jumper on the integrated control board. The jumper is factory-set for use with a two-stage thermostat. It must be adjusted for use with a single-stage thermostat.

NOTE - If a single-stage thermostat is being used, check the position of switch 3 on S1. The switch is factory-set in the ON position to provide a 10-minute delay before second-stage heat is initiated. The switch must be toggled to the OFF position to provide a 5-minute delay. See figure 28.

- 14 - When there is no demand for heating or cooling and the thermostat is set to "FAN ON," the indoor blower will run continuously in the low heating speed.

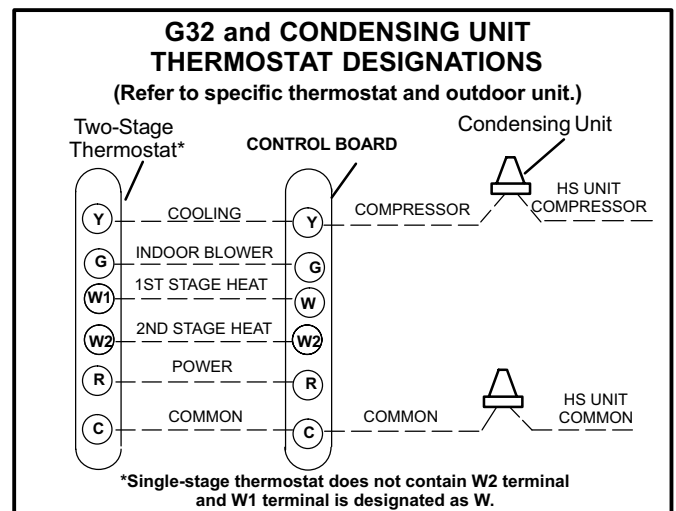
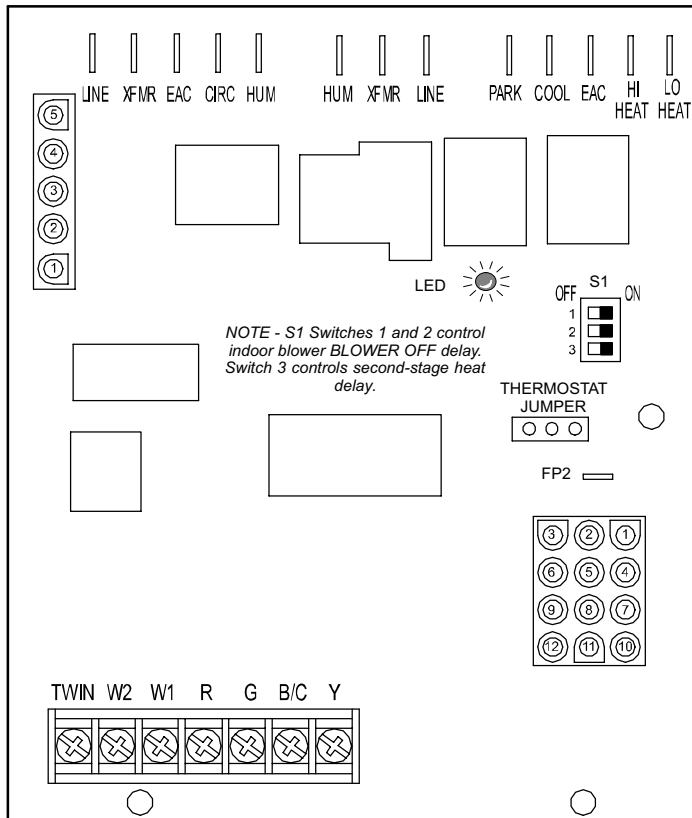


FIGURE 27

INTEGRATED CONTROL BOARD



TERMINAL DESIGNATIONS

COOL	Blower - Cooling Speed (Line Volt)
PARK	Alternate Blower Speed (Dead)
HEAT LO	Blower - Heating Low Speed (Line Volt)
HEAT HI	Blower - Heating High Speed (Line Volt)
LINE	120VAC Hot Input
XFMR	120VAC Hot to Transformer
EAC	(Optional) Electronic Air Cleaner (Line Volt)
HUM	(Optional) Humidifier (Line Volt)
IGN	Ignitor (High Volt)
IND HI	Combustion Air Inducer - High Speed (Line)
IND LO	Combustion Air Inducer - Low Speed (Line)
IND N	Combustion Air Inducer - Neutral
IGN N	Ignitor - Neutral
CIRC N	Blower - Neutral
LINE N	120VAC - Neutral
XFMR N	Transformer - Neutral
HUM N	Humidifier - Neutral
EAC N	Electronic Air Cleaner - Neutral
HLO	High Limit Output
HLI	High Limit Input
N/A	
PS1	First Stage Pressure Switch Input
MVL	Gas Valve Second Stage
MVH	Gas Valve First Stage
GND	Ground
GND	Ground
PS2	Second Stage Pressure Switch Input
MV COM	Gas Valve Common
TR	24VAC Return from Transformer (Common)
TH	24VAC Hot from Transformer
FP	Flame Sensor Terminal

FIGURE 28

TYPICAL G32 FIELD WIRING DIAGRAM

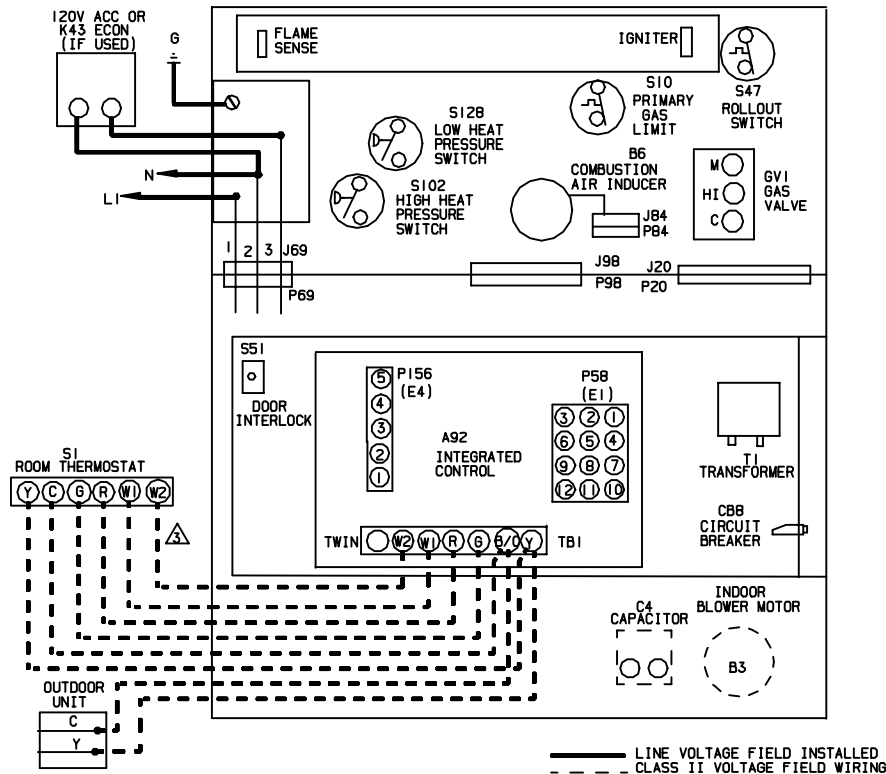


FIGURE 29

TYPICAL G32 SCHEMATIC WIRING DIAGRAM

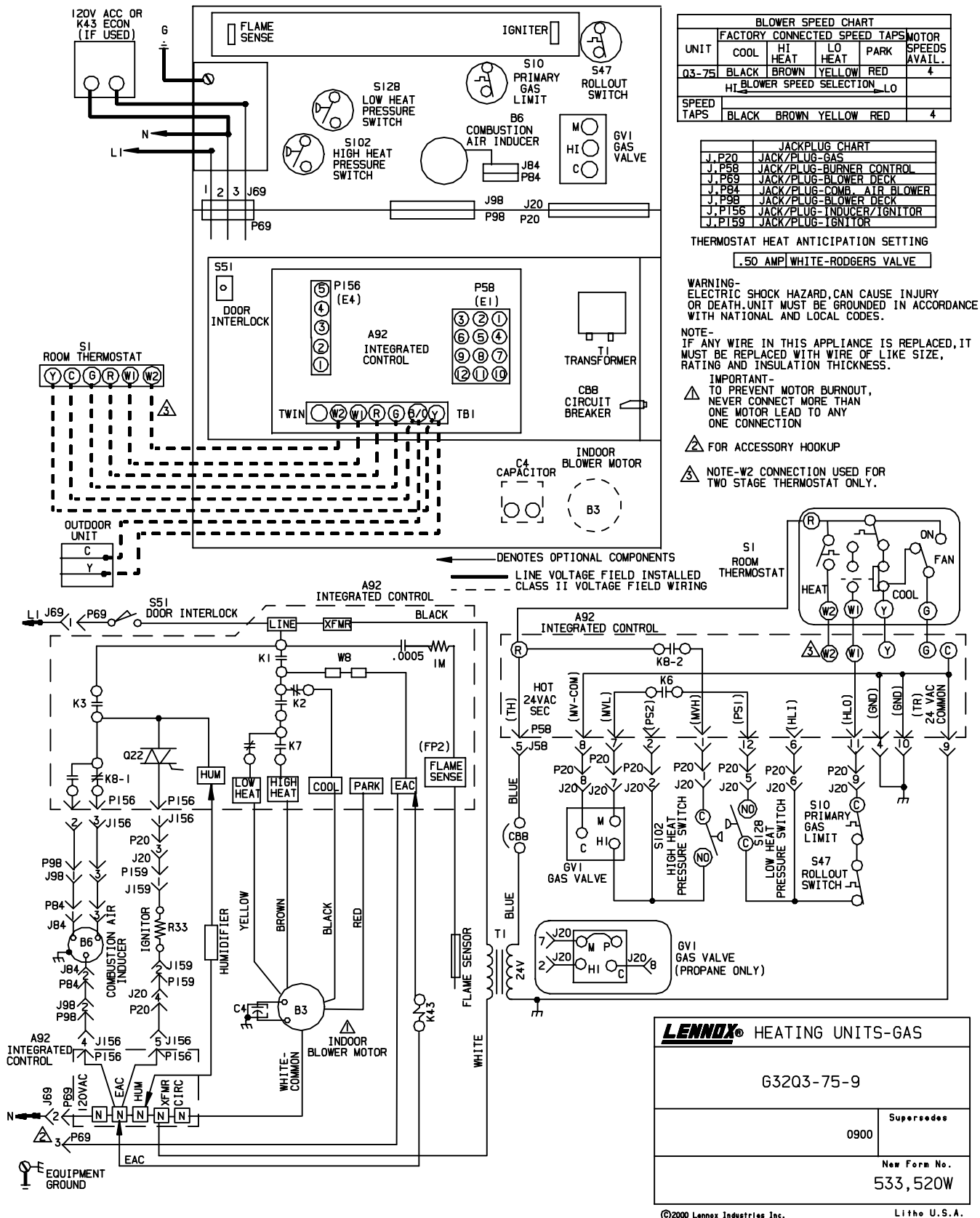


FIGURE 30

Unit Start-Up

FOR YOUR SAFETY READ BEFORE OPERATING

⚠ WARNING

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

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.

⚠ CAUTION

Before attempting to perform any service or maintenance, turn the electrical power to unit OFF at disconnect switch.

BEFORE OPERATING smell all around the appliance area for gas. Be sure to smell next to the floor because some gas is heavier than air and will settle on the floor.

Unit is equipped with a gas control lever. Use only your hand to switch the gas control lever. Never use tools. If lever will not switch by hand, do not try to repair it, call a qualified service technician. Force or attempted repair may result in a fire or explosion.

G32 units are equipped with an electronic ignition system. Do **not** attempt to manually light burners on this furnace. Each time the thermostat calls for heat, the burners will automatically light. The ignitor does not get hot when there is no call for heat on units with this ignition system.

Gas Valve Operation

⚠ WARNING

If you do not follow these instructions exactly, a fire or explosion may result causing property damage, personal injury or death.

- 1 - **STOP!** Read the safety information at the beginning of this section.
- 2 - Set thermostat to lowest setting.
- 3 - Turn off all electrical power to furnace.
- 4 - This furnace is equipped with an ignition device which automatically lights the burner. Do **not** try to light the burner by hand.
- 5 - Remove unit access panel.

- 6 - *White Rodgers 36E Gas Valve* - Switch gas valve lever to **OFF**. See figure 33.

White Rodgers 36E LP Gas Valve - Turn gas valve knob to **OFF**. See figure 34.

- 7 - Wait five (5) minutes to clear out any gas. If you then smell gas, **STOP!** Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions. If you do not smell gas go to next step.

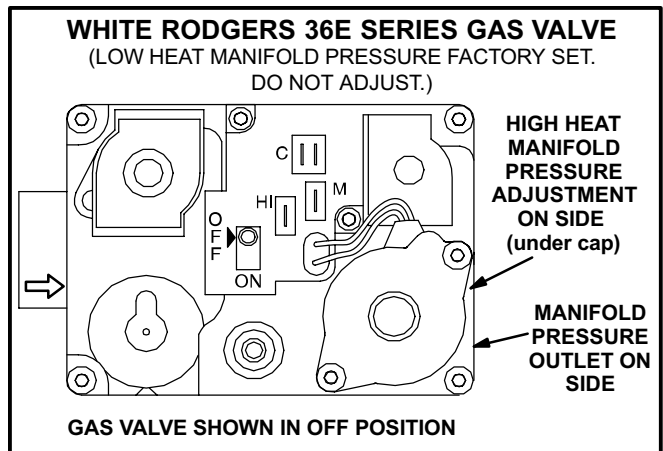


FIGURE 31

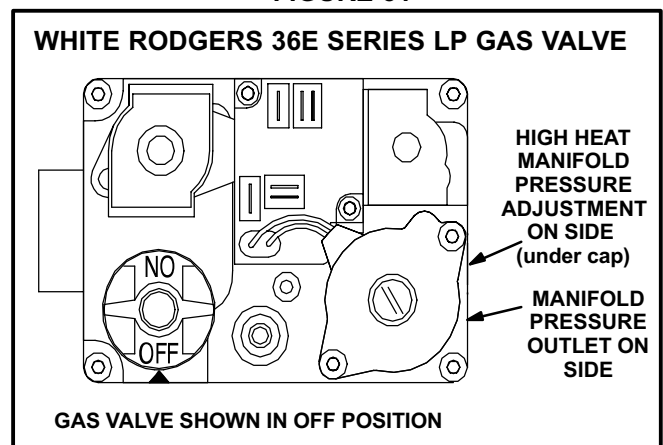


FIGURE 32

- 8 - *White Rodgers 36E Gas Valve* - Switch gas valve lever to **ON**.
- 9 - Replace access panel.
- 10 - Turn on all electrical power to unit.
- 11 - Set thermostat to desired setting.
- 12 - If the appliance will not operate, follow the instructions "To Turn Off Gas To Unit" and call your service technician or gas supplier.

Turning 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 - Remove access panel.
- 4 - *White Rodgers 36E gas valve*, switch lever to **OFF**. Do not force.
- 5 - Replace access panel.

Heating Sequence of Operation

NOTE - The thermostat jumper on the control board is factory-set in the "TWO-STAGE" position.

Applications Using A Single-Stage Thermostat

A - Heating Sequence -- Control Board Thermostat Jumper in "Single Stage" Position Using Single-Stage Thermostat

NOTE - To operate in this mode, the thermostat jumper on the control board must be in the "single stage" setting. See figure 28. In this case, second stage heat will be initiated if heating demand has not been satisfied before an adjustable(5 or 10-minute) period ends.

- 1 - On a call for heat, thermostat contacts close sending a signal to the integrated control module. The integrated control runs a self-diagnostic program and checks high limit switches for normally closed contacts and pressure switches for normally open contacts. The combustion air inducer is energized at high speed and the humidifier is energized.
- 2 - Once the control receives a signal that the low pressure switch has closed, the combustion air inducer begins a 15-second prepurge in high speed.
- 3 - After the prepurge is complete, the combustion air inducer is switched to low speed and a 20-second initial ignitor warm-up period begins.
- 4 - After the 20-second warm-up period has ended, the gas valve is energized on low fire (first stage). Ignition occurs and a signal is sent from the control module to begin "HIGH FIRE ON" delay (factory set at 10 minutes).
- 5 - "BLOWER ON" delay begins (45 seconds). When delay ends, indoor blower motor is energized on low heating speed.
- 6 - If the "HIGH FIRE ON" delay ends and the demand for heat is still not satisfied, the control switches the furnace to second-stage operation (high heat). In second stage operation, the following occur: combustion air inducer is energized at high speed; indoor blower motor is energized on high heating speed; and gas valve is energized on high heat.
- 7 - When the demand for heat is satisfied, the high- and low-heat stages of the gas valve are de-energized, the combustion air inducer begins the 15-second post purge operation on low speed and the indoor blower motor goes into the blower-off delay.

NOTE - If the heating demand is satisfied while the unit is operating in second-stage heat, the indoor blower motor will operate in high heating speed for the initial 30 seconds of the blower-off delay. The blower motor will switch to the low heating speed for the remainder of the delay.

- 8 - When the combustion air inducer post-purge period is complete, the humidifier is de-energized.

Applications Using A Two-Stage Thermostat

B - Heating Sequence -- Control Board Thermostat Jumper in "Two Stage" Position (Factory Setting) Using Two-Stage Thermostat

The sequence of operation is the same as outlined above (in section A), except that low-heat and high-heat operation is controlled by the room thermostat.

Blower Operation

- 1 - When the thermostat is set to "FAN ON," the indoor blower will run on low heating speed when there is no cooling or heating demand.
- 2 - When the G32 is running in low fire (first stage), the indoor blower will run on low heating speed.
- 3 - When the G32 is running in high fire (second stage), the indoor blower will run on the high heating speed.
- 4 - When there is a cooling demand, the indoor blower will run on the cooling speed.

Gas Pressure Adjustment

Gas Flow

To check for proper gas flow to the combustion chamber, determine the Btu (kW) input from the unit rating plate. Divide this input rating by the Btu (kW) per cubic foot (cubic meter) of available gas. The result is the required number of cubic feet (cubic meter) per hour. Determine the flow of gas through the gas meter for two minutes and multiply by 30 to get the hourly flow of gas.

Gas Pressure

- 1 - Check gas line pressure with unit firing at maximum rate. A minimum of 4.5 in. w.c. (1.12 kPa) for natural gas should be maintained.
- 2 - After line pressure has been checked and adjusted, check high heat regulator pressure. See figure 36 for gas pressure adjustment screw location. **Low heat setting is factory-set and is not field-adjustable.** High heat manifold pressure is given in table 6.

Manifold Pressure Measurement & Adjustment

NOTE - Pressure test adaptor kit (10L34) is available from Lennox to facilitate manifold pressure measurement.

- 1 - Connect test gauge to outlet tap on gas valve.
- 2 - Disconnect pressure sensing hose from gas valve and plug hose by covering opening with tape or equivalent. Leave barbed fitting on valve open to atmosphere. See figure 33 for differential pressure switch circuitry.
- 3 - Start unit on high heat and allow 5 minutes for unit to reach steady state.

TABLE 6

Model No.	Manifold Pressure (outlet) in. w.g. (kPa)			
	0 to 4500 ft. (0 to 1372 m) above sea level	4501 to 5500 ft. (1373 to 1676 m) above sea level	5501 to 6500 ft. (1677 to 1981 m) above sea level	6501 to 7500 ft. (1982 to 2286 m) above sea level
G32-75 natural	3.5	3.5	3.5	3.5
G32-75 L.P.	7.5	7.5	7.5	7.5

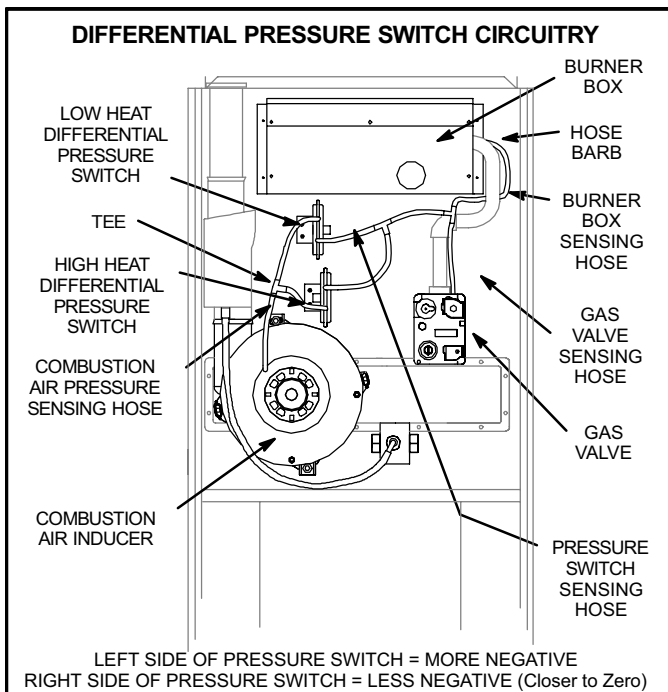


FIGURE 33

4 - While waiting for the unit to stabilize, notice the flame. Flame should be stable and should not lift from burner. Natural gas should burn blue.

5 - After allowing unit to stabilize for 5 minutes, record manifold pressure and compare to value given in table 6.

NOTE - Shut unit off and remove manometer as soon as an accurate reading has been obtained. Take care to replace pressure tap plug.

NOTE - During this test procedure, the unit will be overfiring:

- Operate unit only long enough to obtain accurate reading to prevent overheating heat exchanger.
- Attempts to clock gas valve during this procedure will be inaccurate. Measure gas flow rate only during normal unit operation.

6 - When test is complete remove obstruction from hose and return hose to gas valve barbed fitting.

High Altitude Information

Refer to table 6 for manifold pressure settings for installations at altitudes from 0 to 7500 feet (0 to 2286 m).

NOTE - In Canada, certification for installations at elevations over 4500 feet (1372 m) is the jurisdiction of local authorities.

The two pressure switches (high and low heat) are factory set and are not to be adjusted.

Other Unit Adjustments

NOTE - Disconnect power to unit before making any adjustments.

Heat Anticipation Settings

Thermostat anticipator setting (if adjustable) should be set according to amps listed on wiring diagram on unit.

Flame Rollout Switch

Factory set: No adjustment necessary.

Limit Control

Factory set: No adjustment necessary.

Pressure Switches

Factory set: No adjustment is necessary.

Indoor Blower Control

The blower-on delay of 45 seconds is not adjustable. The blower-off delay (time that the blower operates after the heating demand has been satisfied) can be adjusted by moving the switches (S1) on the integrated control board. The unit is shipped from the factory with a blower-off delay of 90 seconds. The table below provides the blower off timings that will result from different switch settings.

TABLE 7
Blower-Off Delay Switch Settings

Blower Off Delay (Seconds)	Switch 1	Switch 2
60	On	On
90	Off	On
120	On	Off
180	Off	Off

Temperature Rise

Check temperature rise and, if necessary, adjust blower speed to maintain temperature rise within range shown on unit rating plate.

Integrated Control Board

This unit may be used with either a single-stage or two-stage thermostat. The appropriate placement of the thermostat jumper must be checked.

- Select "TWO" for two-stage heating operation controlled by a two-stage heating thermostat;
- Select "SINGLE" for two-stage heating operation controlled by a single-stage heating thermostat. This setting provides a timed delay before second-stage heat is initiated.

NOTE - Check the position of switch 3 on S1. The switch is factory-set in the ON position to provide a 10-minute delay before second-stage heat is initiated. The switch must be toggled to the OFF position to provide a 5-minute delay. See figure 28.

The integrated control includes an internal watchdog feature. The control provides an automatic reset device for ignition controls locked out because the burner has failed to light. After one hour of continuous thermostat demand for heat, the watchdog will break and remake thermostat demand to the furnace and automatically reset the control to relight the furnace.

Electrical

- 1 - Check all wiring for loose connections.
- 2 - Check circuit breaker located on unit control box.
- 3 - Check for the correct voltage at the furnace (furnace operating).

- 4 - Check amp-draw on the blower motor.
Motor Nameplate _____ Actual _____.

NOTE - Do not secure electrical conduit directly to duct system or structure.

Blower Speeds

Refer to blower speed selection chart on unit wiring diagram.

NOTE - CFM readings are taken external to unit with a dry evaporator coil, filter installed and without any other accessories.

Burner Flame

Start burner and allow to operate for a few minutes to establish normal burning conditions. Check burner flame by observation. Flame should be predominantly blue and strong in appearance.

Check burner flame periodically to ensure proper operation.

Service

WARNING

Disconnect power before servicing unit.

CAUTION

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

Annual Service

At the beginning of each heating season, system should be checked as follows by a qualified service technician:

Electrical

- 1 - Check all wiring for loose connections.
- 2 - Check circuit breaker located on unit control box.
- 3 - Check for the correct voltage at the furnace (furnace operating).
- 4 - Check amp-draw on the blower motor.
Motor Nameplate _____ Actual _____
- 5 - Check to see that heat (if applicable) is operating.

Blower

Check the blower wheels for debris and clean if necessary. The blower motors are prelubricated for extended bearing life. No further lubrication is needed.

Filters

- 1 - Filters must be cleaned or replaced when dirty to assure proper furnace operation.

- 2 - Reusable foam filters used with the unit can be washed with water and mild detergent. When dry, they should be sprayed with filter handicoater prior to reinstallation. Filter handicoater is RP Products coating no. 418 and is available as Lennox part no. P-8-5069.
- 3 - If replacement is necessary, order Lennox part no. 31J81 for 14-inch x 25-inch (356 x 635 mm) filter.

Intake and Exhaust Lines

Check intake and exhaust lines and all connections for tightness and make sure there is no blockage. Also check condensate line for free flow during operation.

Insulation

Outdoor piping insulation should be inspected yearly for deterioration. If necessary, replace with same materials.

Winterizing and Condensate Trap Care

- 1 - Turn off power to unit.
- 2 - Have a shallow pan ready to empty condensate water. Avoid spilling water into the control box.
- 3 - Remove clamp from flue assembly and remove boot or cap. Empty water from cap. Visually inspect bottom of flue assembly. Replace boot and clamp.
- 4 - Remove boot from condensate trap and empty water. Inspect trap then replace boot.

Cleaning DuralokPlus™ Heat Exchanger

If cleaning the heat exchanger is necessary, follow the procedures below, and refer to figure 1 while you disassemble the furnace. Place papers or protective covering in front of the furnace while you remove the heat exchanger assembly.

- 1 - Turn off electrical and gas power supplies to furnace.
- 2 - Remove upper and lower furnace access panels.
- 3 - Remove four screws around air intake fitting and lift intake pipe up and away.
- 4 - Loosen hose clamp securing top of flue transition to bottom of flue collar. Remove screw securing flue collar to top cap and lift exhaust pipe and flue collar up and away.
- 5 - If electrical field make-up box is located inside the unit, it must be removed.
- 6 - Remove gas supply line connected to gas valve.
- 7 - Mark all gas valve wires and disconnect them from valve. Mark and remove wires from flame roll-out switch.
- 8 - Remove top cap of unit.
- 9 - Remove sensor wire from integrated control. Disconnect 2-pin plug from the ignitor.
- 10 - Mark and disconnect pressure switch tubing from both sides of the pressure switch(es).
- 11 - Loosen two screws holding gas manifold support at vestibule panel.
- 12 - Remove four burner box screws at the vestibule panel and remove burner box and gas valve/manifold assembly with bracket.

- 13 - Drain condensate trap. Disconnect condensate line from the outside of unit. Remove condensate line from condensate trap by turning the adapter fitting counter-clockwise. The fitting has standard right hand threads.
- 14 - Disconnect the drain hose from the flue transition to the elbow on the cold header (collector) box trap.
- 15 - Disconnect the 3-pin plug from the combustion air blower at the blower deck. Remove four screws from combustion air blower and remove flue transition and blower assembly from cabinet. Take care not to lose the combustion air orifice.
- 16 - Disconnect 9-pin plug from the blower compartment at the blower deck.
- 17 - Remove 9-pin plug above the blower deck.
- 18 - Remove the limit switch and the pressure switch(es) from the vestibule panel.
- 19 - Remove two screws from the front cabinet flange at the blower deck. Remove front screws from cabinet at blower deck on left and right sides. Cabinet sides must be slightly spread to clear heat exchanger passage.
- 20 - Remove screws along vestibule sides and bottom which secure vestibule panel and heat exchanger assembly to cabinet. Remove heat exchanger.
- 21 - Back wash heat exchanger with soapy water solution or steam. **If steam is used it must be below 275°F (135°C).**
- 22 - Thoroughly rinse and drain the heat exchanger. Soap solution can be corrosive so take care that entire assembly is completely rinsed.
- 23 - Reinstall heat exchanger into cabinet making sure that the clamshells of the heat exchanger assembly are resting in the notches of the support located at the rear of the cabinet. This can be viewed by removing the indoor blower and examining through the blower opening.
- 24 - Resecure the supporting screws along the vestibule sides and bottom to the cabinet.
- 25 - Reinstall cabinet screws on sides and front flange at blower deck.
- 26 - Reinstall the limit switch and pressure switches on the vestibule panel.
- 27 - Reinstall 9-pin plug to blower deck and connect it to the 9-pin plug from below the blower deck.
- 28 - Reinstall the combustion air blower. Be careful that the plastic orifice on the blower inlet has not fallen out. See figure 1. Reconnect the 3-pin plug to the wire harness. Reinstall the flue transition in the cabinet and reattach the drain tube. Route the drain tube below the combustion air blower housing and to the elbow on the cold header (collector) box trap. See figure 33.
- 29 - Reinstall condensate line with adapter to condensate trap. Use fresh Teflon tape to ensure a leak-free joint. Re-connect to condensate line outside of the unit.
- 30 - Reinstall the burner box. Tighten the screws holding the support bracket. It is important that the glass fiber gasket not be damaged so it will provide a continuous seal between the burner box and the vestibule panel.
- 31 - Reconnect pressure switch tubing by connecting the tubing from the burner box to the barb on the bottom and the tubing from the combustion air blower to the barb on the top. See figure 33.
- 32 - Reconnect the sensor and ignitor wires.
- 33 - Reinstall top cap to unit.
- 34 - Reinstall electrical connections to gas valve. Brown wire to "HI," yellow wire to "C" and orange wire to "M." Reconnect wires to flame roll-out switch.
NOTE - Unit is polarity-sensitive. 120V supply wiring must be installed correctly.
- 35 - Reconnect main gas line to gas valve. Use second wrench on gas valve to avoid transferring torque to the gas manifold.
- 36 - Reinstall field make-up box if removed.
- 37 - Reinstall exhaust pipe/flue collar and secure flue collar to the unit top cap using existing screw. Insert the bottom of the flue collar into the top of the flue transition and tighten hose clamp.
- 38 - Reinstall intake pipe fitting to burner box with screws.
- 39 - Replace both upper and lower access panels.
- 40 - Refer to instruction on verifying gas and electrical connections when re-establishing supply.
- 41 - Following lighting instructions from installation manual, light and run unit for 5 minutes to ensure heat exchanger is clean, dry and operating safely.

Cleaning the Burner Assembly

- 1 - Turn off electrical and gas power supplies to furnace. Remove upper and lower furnace access panels.
- 2 - Disconnect the gas supply line to gas valve. Depending on gas plumbing installation, the gas manifold may move aside enough that breaking the union may not be necessary.
- 3 - Remove five screws from edges of burner box cover.
- 4 - Loosen two screws on bottom of burner box front. The cover is key holed at these screw point so screws do not need to be removed. Pull off cover and set aside.
- 6 - Mark all gas valve wires and disconnect them from valve.
- 7 - Mark and disconnect sensor wires from the burner box at the ignition control. Disconnect 2-pin plug from the ignitor at the burner box.
- 8 - Loosen two screws at the gas manifold support bracket.
- 9 - Pull on the left side of the gas manifold and follow with tension to the right side. The manifold support bracket will be free of the mounting screws on the vestibule panel. Set the gas manifold/gas valve assembly aside. Take care not to damage foam gaskets on each end of the gas manifold.

- 10 - Using a 1/4 inch nut driver, remove the burner mounting screws from underneath the burners.
- 11 - While supporting ignitor and sensor lines at the grommet, grasp burners and simultaneously pull burners and grommet out of the burner box.
- 12 - Remove ignitor and sensor bracket assemblies from burners using a 1/4 inch nut driver to remove two screws from each bracket.
- 13 - Clean burner by running a vacuum with a soft brush attachment over face of burners. Use burner brush to clean inside of burners. Visually inspect inside of burners and crossovers for any blockage caused by foreign matter. Remove any blockage.
- 14 - Reinstall ignitor and sensor bracket assemblies on burners.

NOTE - Ignitor must be installed on the opposite side of the burner from the metal button protrusions. Screws which attached the ignitor bracket must be installed from the same side as the ignitor and through the bracket to engage in the smaller holes located in the burner. The correct burner orientation is with metal button protrusions always pointing up.

- 15 - Replace burner ignitor assembly back into burner box so that grommet groove fits back into sheet metal notch and makes a good seal. The burners sit on top of the burner box flanges. Make certain that the screws from underneath the box pass through the larger holes in the flange and engage in the smaller holes in the burner. Reinstall the two screws.
- 16 - Reinstall the gas manifold/gas valve assembly by first

inserting the right hand side of the gas manifold into the burner box. Swing left side of manifold into box while engaging support bracket to vestibule panel screws. Check that foam gaskets are providing a seal around each end of the gas manifold. All gas orifices should be engaged. If at this point the burners were mounted in the wrong holes, this needs to be corrected. The saddle brackets on the gas manifold should be flush with the front surfaces on the burner box sides.

- 17 - Inspect the dual layered metal pieces at the front lip of the cover. These pieces must sandwich around the metal. Reinstall burner box cover.
- 18 - Reinstall the screws to secure the burner box cover. Make sure screws are tight to ensure a leak tight burner box. Tighten the two screws underneath the box. Again, inspect the grommet to ensure a tight seal.
- 19 - Tighten the two screws holding the manifold bracket to the vestibule panel.
- 20 - Reinstall the electrical connections to the gas valve. Brown wire to "HI" yellow wire to "C" and orange wire to "M."
- 21 - Reinstall the 2-pin ignitor plug at the burner box. Reinstall sensor line to ignition control spade connector.
- 22 - Reconnect gas line to gas valve.
- 23 - Replace lower access panel.
- 24 - Following lighting instructions and gas line connection test procedures from installation manual.
- 25 - Replace upper access panel.

Repair Parts List

The following repair parts are available through independent Lennox dealers. When ordering parts, include the complete furnace model number listed on the unit rating plate. Example: G32Q3-75-1.

CABINET PARTS

Cabinet cap
Blower panel
Upper access panel

CONTROL PANEL PARTS

Integrated control board
Transformer
Circuit breaker
Door interlock switch

BLOWER PARTS

Blower wheel
Motor
Motor capacitor
Blower housing cut-off plate
Blower housing

HEATING PARTS

Heat exchanger/coil assembly
Gas manifold

Combustion air inducer
Main burner orifices
Main burners
Two-stage gas valve
Ignitor
Primary limit control
Flame rollout switch
Filter and filter rack assembly
Flue transition
Pressure switch - high heat
Pressure switch - low heat
Flame sensor
Sight glass and grommet
Rubber boot trap
Foam manifold gaskets
Condensate pipe plug and adapter
Cold end header (collector) box

Troubleshooting

System Lockout

When a system lockout has been initiated by the control, the gas valve is de-energized, the combustion air inducer is energized in the low speed and the indoor blower is energized in the low heating speed.

The control can be reset by interrupting the call for heat at the thermostat for at least one second, but less than 20 seconds. **If flame is sensed with the gas valve de-energized, this will not reset the control.** The control can also be reset by interrupting 24VAC to the control for at least 10 seconds. The flame rollout sensor switch should be checked and reset, if necessary.

The control will automatically reset after one hour.

Diagnostic Codes

Flash Sequence	Mode
1 flash	System lockout (retries exceeded)
2 flashes	Low pressure switch stuck closed
3 flashes	Low pressure switch stuck opened
4 flashes	Open high temperature limit
5 flashes	Not used
6 flashes	115VAC polarity reversed
7 flashes	Low flame sense signal
8 flashes	Ignitor problem or improper grounding
9 flashes	High pressure switch stuck open
Continuous flash	Flame sensed with gas valve off

NOTE - Each flash lasts approximately .25 seconds. The pause between each flash sequence lasts 2 seconds.

Diagnostic Features

The integrated control continuously monitors its own operation and the operation of the furnace. If a failure occurs, the red LED will flash a failure code. If the failure is internal to the control, the light will stay on continuously. In this case, the control should be replaced. The control is not field-repairable. If the LED is continuously off, there may not be power to the control, the fuse on the control may be open, or there may be a control failure.

Control Board Specifications

Activity	Timing
Pre-Purge	15 seconds
Ignitor Warm-Up	20 seconds
Trial for Ignition	4 seconds
Ignition Activation	4 seconds
Retries	4 times
Valve Sequence	20 seconds
Interpurge	15 seconds
Post-Purge	15 seconds
Lockout Time	300 seconds
Heating Blower On Delay	45 seconds
Heating Blower Off Delay	60/90/120/180 seconds
Second-Stage Heat On Delay	5/10 minutes
Cooling Blower On Delay	0 seconds
Cooling Blower Off Delay	2 seconds
Automatic Reset Timing	60 minutes

G32 Start-Up & Performance Check List

Job Name _____ Job Number _____ Date _____
Job Location _____ City _____ State/Province _____
Installer _____ City _____ State/Province _____
Unit Model Number _____ Serial Number _____ Service Technician _____

HEATING SECTION

Electrical Connections Tight? ☐ Supply Voltage _____
Blower Motor Amps _____ Blower Motor Horsepower/kW _____
Blower Motor Lubrication OK? ☐
Gas Piping Connections Tight & Leaks Tested? ☐
Fuel Type: Natural Gas? ☐
Furnace Btu (kW) Input _____ Line Pressure _____
Regulator Pressure w.c./Pa -- Nat. _____
Air Shutters Properly Adjusted (If Installed)? ☐
Connections Tight? ☐ Proper Draft?
Indoor Blower On Delay (45 Seconds) _____ Indoor Blower Off Delay Setting _____
Temperature Rise _____ Filter Clean & Secure? ☐ Vent Clear? ☐

THERMOSTAT

Calibrated? ☐ Heat Anticipator Properly Set? ☐ Level? ☐