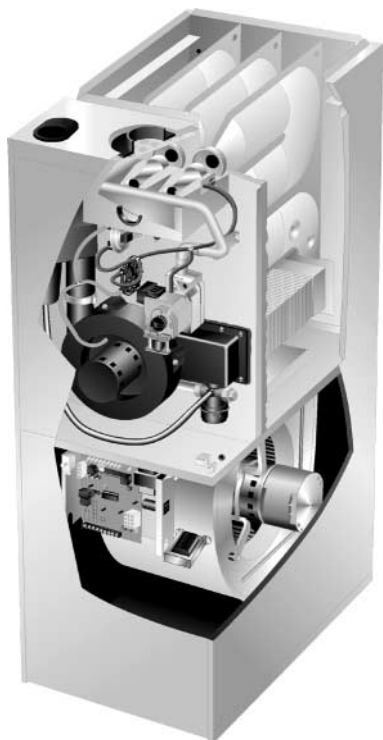




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Dallas, Texas, USA

INSTALLATION INSTRUCTIONS

G32V SERIES UNITS



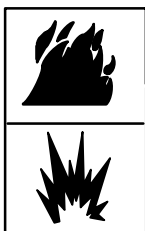
GAS UNITS
504,564M
5/2002
Supersedes 504,468M

TP Technical
Publications
Litho U.S.A.

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**RETAIN THESE INSTRUCTIONS
FOR FUTURE REFERENCE**



⚠ WARNING

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



WHAT TO DO IF YOU SMELL GAS:

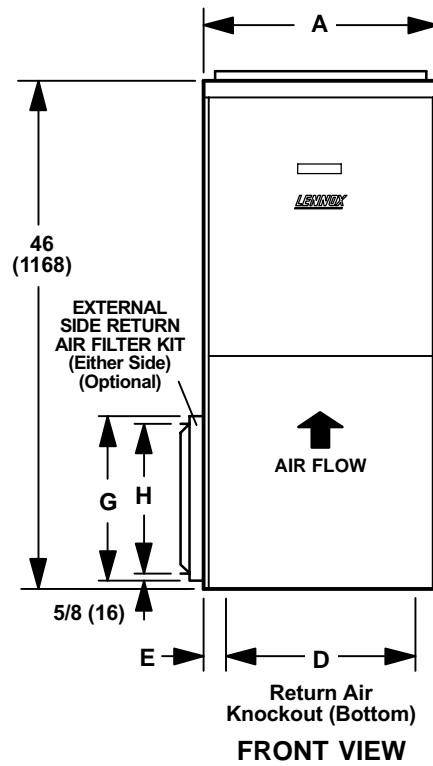
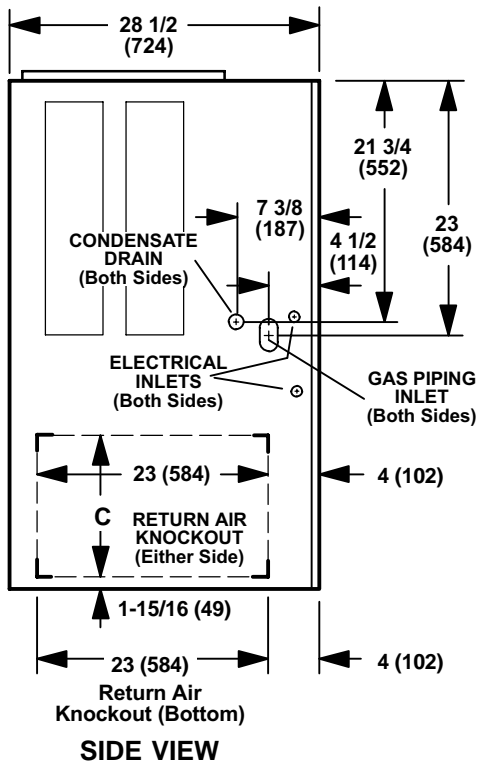
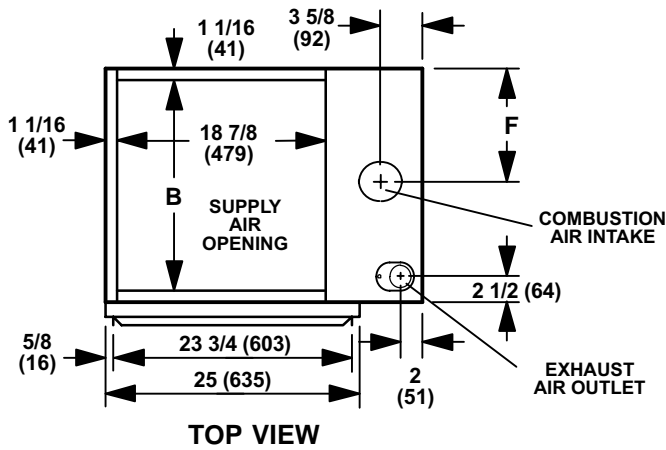
Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.

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

- 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.
- Leave the building immediately.
- 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.



G32V 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
G32V3-75	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
G32V5-100	21-1/4	540	19-1/8	486	18	457	18	457	1-5/8	41	10-1/8	257	20	508	18-3/4	476
G32V5-125	26-1/4	667	24-1/8	613	18	457	18	457	4-1/8	105	12-5/8	321	20	508	18-3/4	476

G32V Parts Arrangement

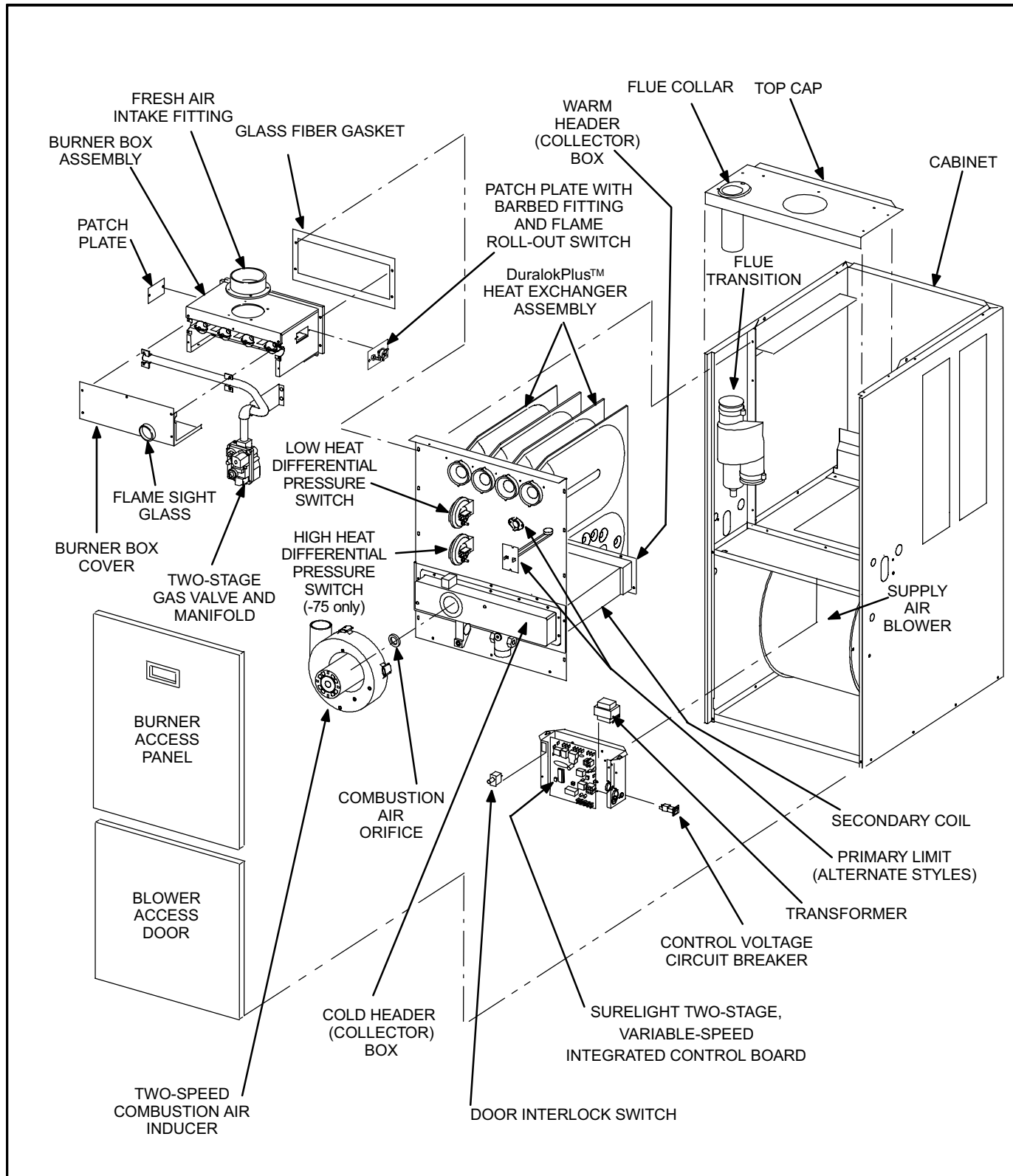


FIGURE 1

Safety Instructions

Lennox G32V units are Category IV CSA International certified to ANSI Z21.47 and CSA 2.3 standards.

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/NFPA 54) 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).

G32V 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 - G32V 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.

The G32V furnace may be installed in alcoves, closets, attics, basements, garages and utility rooms in the upflow position.

General

The G32V is an upflow gas furnace which is factory-equipped for use with natural gas. A changeover kit is necessary if the furnace is to be used with L.P. gas. 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 G32V furnace
- 1 - 3 inch x 2 inch vent transition piece (-100, -125 units only)
- 1 - Bag assembly containing:
 - 1 - Filter
 - 1 - External filter rack for side return air application
- 1 - Bag assembly containing:
 - 1 - Electrical make-up box with cover and grounding screw
 - 4 - Thread-forming make-up box screws
 - 1 - Green ground wire
 - 1 - Wiring harness
 - 1 - Snap bushing
 - 2 - Filter clips
 - 1 - Condensate drain pipe adapter
 - 1 - Condensate plug
 - 4 - Wire nuts
 - 2 - Lockwashers and screws
 - 8 - Self-tapping screws
 - 2 - Filter door pins
 - 1 - Grounding label
 - 1 - Wire tie

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.

CAUTION

As with any mechanical equipment, personal injury can result from contact with sharp sheet metal edges. Be careful when you handle this equipment.

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.

CAUTION

G32V 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 heating 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.

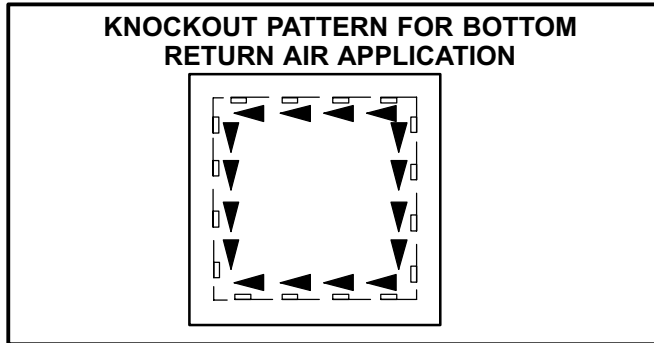


FIGURE 2

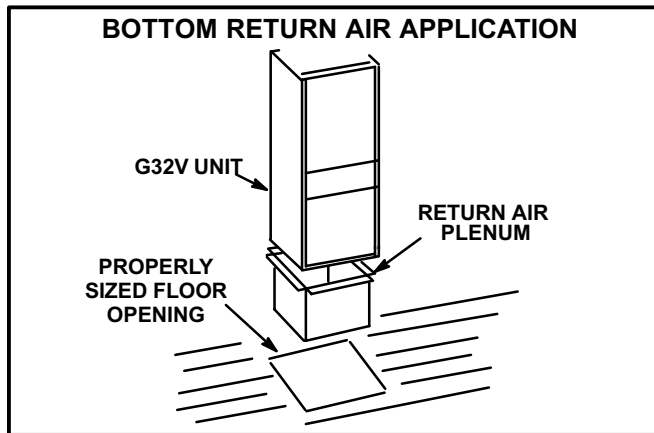


FIGURE 3

- 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 airtight with return air plenum.

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 the furnace cabinet at the dimensions given in the unit dimensions graphic. Embossed corners are provided on both cabinet sides for return air opening location.

Filter & 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.

**TABLE 2
FILTER SIZE REQUIREMENTS**

UNIT MODEL NUMBER	FILTER PART NUMBER	FILTER SIZE
G32V-75	31J81	14 inches x 25 inches (356 x 635 mm)
G32V-100 G32V-125	P-8-7831	20 inches x 25 inches (508 x 635 mm)

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.

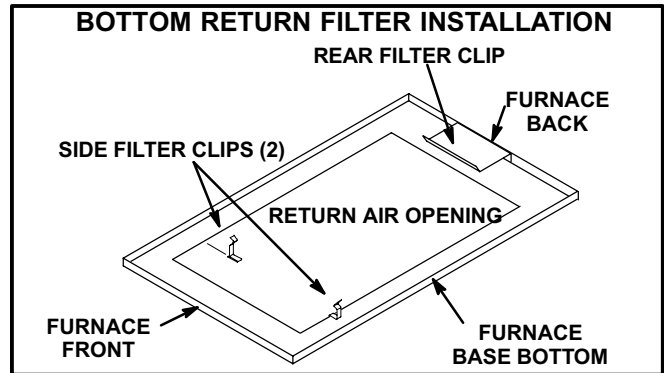


FIGURE 4

- 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.

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 - Screw filter rack into place with the eight self drill, self tap screws provided. See figure 5.
- 3 - Push filter door pins through the two holes in filter rack door from the inside of the u-channel. See figure 6.

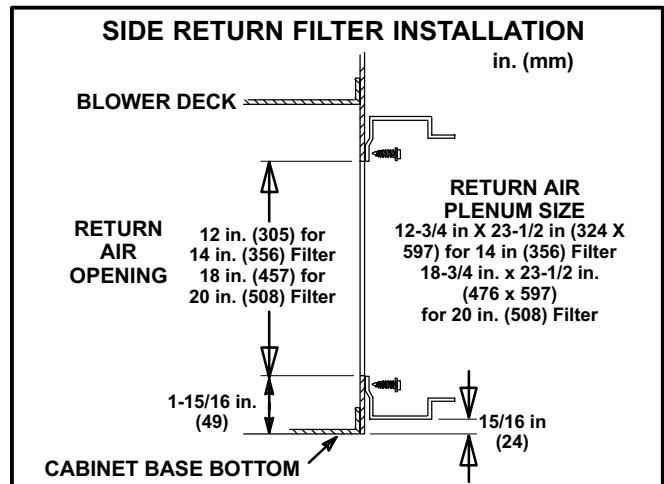


FIGURE 5

- 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.

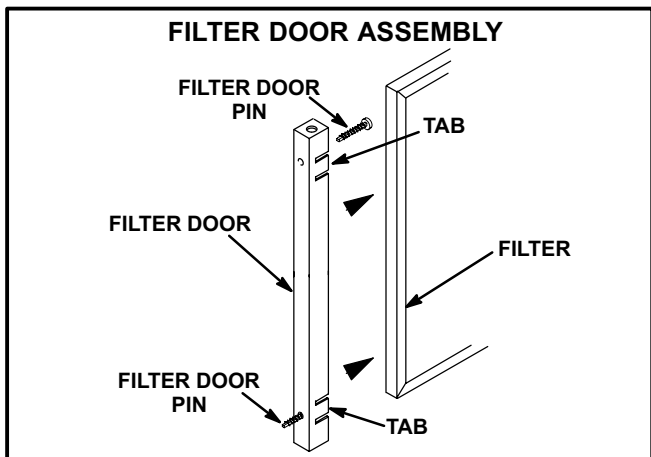


FIGURE 6

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. If the G32V unit is being installed as a replacement for an existing furnace, the existing supply and return air duct system should be evaluated to make sure that it is appropriately sized.

The total external static pressure (ESP) should not exceed 0.8" w.c. The ESP calculation should include pressure losses caused by electronic air cleaners, filters, cooling coils, the duct system, registers and grilles. A properly sized duct system will help to optimize efficiency and reliability and to minimize sound levels. Operation of a G32V unit outside of its specified static pressure range will result in poor performance and will reduce the useful life-expectancy of the product and its components.

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 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 3 for approved piping and fitting materials.

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 strapping may be used for vent pipe hangers.

Table 4 lists the available exhaust termination kits. All Lennox vent terminations are PVC.

TABLE 3
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

**TABLE 4
TERMINATION KITS**

Lennox Part No.	Kit LB#	Description-Inches (mm)
60G77	LB-49107CE	1-1/2" (50.8) Concentric Termination Kit
33K97	LB-87942	3" (50.8) Low Pressure Drop Concentric Term. 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

⚠ 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.

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 5. 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 plus 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 5
VENT PIPE SIZING TABLE FOR G32V FURNACES
MINIMUM DIAMETER OF INTAKE/EXHAUST PIPE**

Vent Pipe Equivalent Length Max. Feet (Meters)	G32V-75 75,000 BTU	G32V-100 100,000 BTU	G32V-125 125,000 BTU
15 (4.57)	2"	2"	2"
20 (6.10)	2"	2"	3"
25 (7.62)	2"	2"	3"
30 (9.14)	2"	3"	3"
40 (12.19)	2"	3"	3"
50 (15.24)	2"	3"	3"
55 (16.76)	2"	3"	3"
60 (18.29)	3"	3"	3"
70 (21.34)	3"	3"	3"
80 (24.38)	3"	3"	3"
90 (27.43)	3"	3"	3"
100 (30.48)	3"	3"	3"
110 (33.53)	3"	3"	3"
120 (36.58)	3"	3"	3"
130 (39.62)	3"	3"	--

NOTE - Minimum vent pipe for G32V-75, G32V-100, and G32V-125 is 5 feet with 2 elbows of 2-inch diameter pipe.

NOTE - When you install a WTKX termination kit as part of the intake and exhaust piping, the two 2-inch diameter 90° elbows and the 27 inch pipe (in the kit) should be included in the maximum vent pipe length for each run.

For 75 kBtuh units, connections are provided for 2-inch diameter vent pipe which should satisfy most venting requirements. No transition pieces are provided or needed for use with 2-inch vent pipe.

For -100 and -125 kBtuh units, the intake connection is sized for 3-inch diameter pipe. The exhaust connection has a 2-inch nipple. A pipe transition piece is shipped with the unit for use with 3-inch pipe. See figure 7 for 2-inch and 3-inch vent pipe applications.

Most venting applications will require 3-inch vent pipe for proper unit operation. **The intake and exhaust pipe must never be constructed of different diameter pipes.** Regardless of the diameter of pipe used, the standard roof and wall terminations described in section *Intake and Exhaust Piping Terminations* should be used. Exhaust piping must terminate with 1-1/2 inch pipe for 1-1/2 inch or 2 inch vents and 2-inch vent pipe for 3-inch vents.

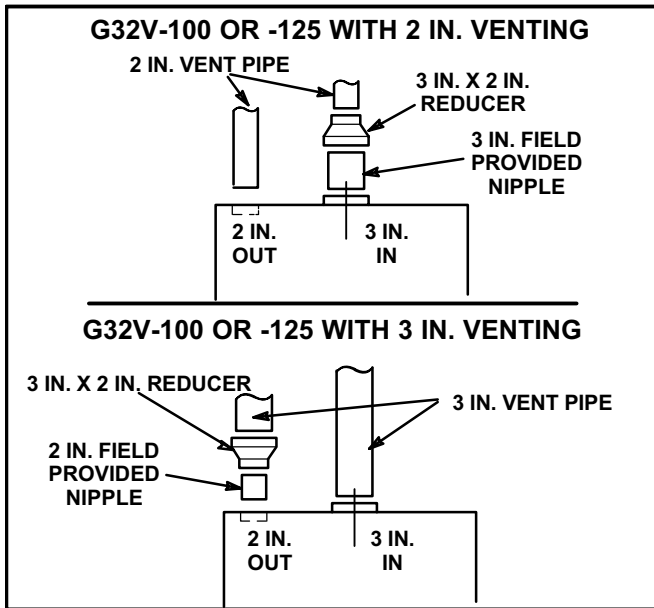


FIGURE 7

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 solvent.
- 9 - Handle joints carefully until completely set.

Venting Practices

⚠ 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 failure. Excessive exposure to contaminated combustion air will result in safety and performance related problems. Avoid exposure to the following 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

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 G32V 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.

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 prevent 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 - Close all building doors and windows, and all doors between the space in which the appliances remain-

ing 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 resized 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 8 through 20 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 5. 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 8.

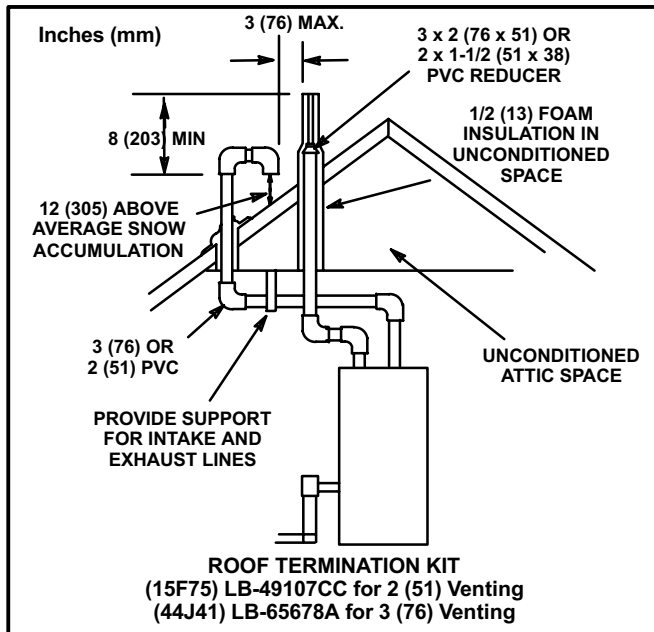


FIGURE 8

▲ 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 (6.67°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 - Avoid recirculation of exhaust back into the intake pipe.

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 9.

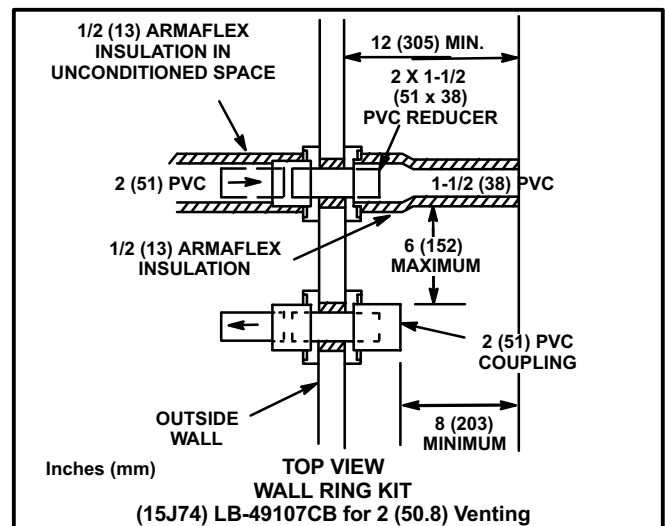


FIGURE 9

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 13 and 15 for proper piping method. WTK wall termination kit must be extended for use in this application. See figure 18 or use kit WTKX shown in figure 19. 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.

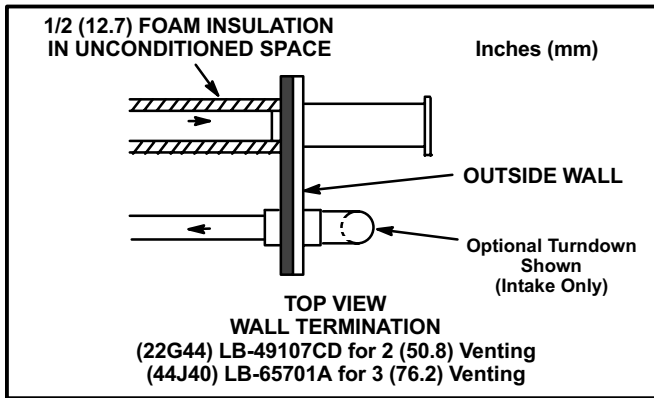


FIGURE 10

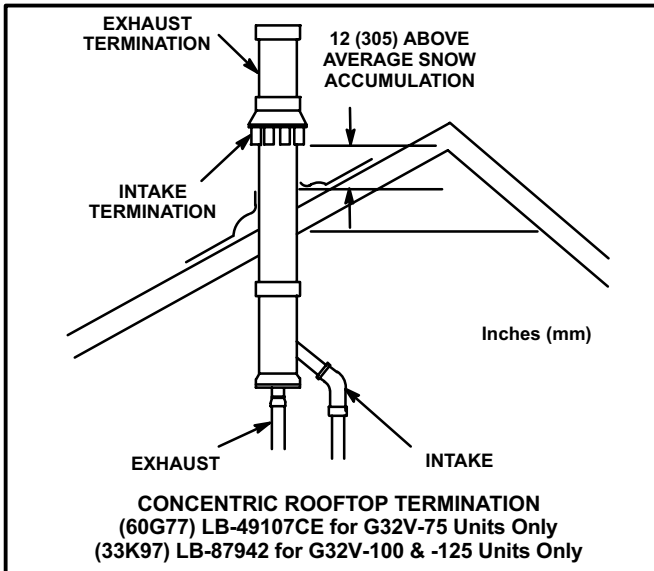


FIGURE 11

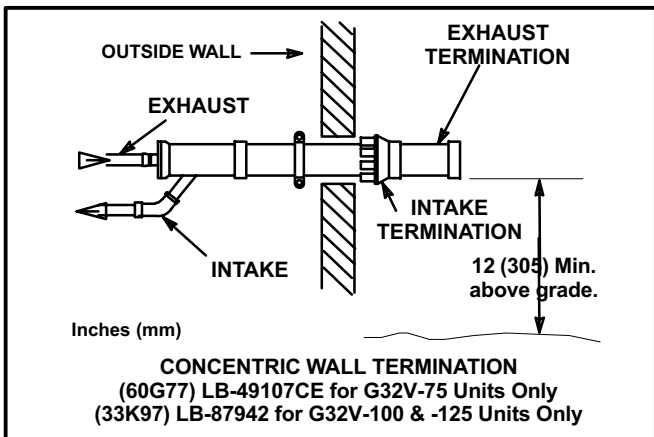


FIGURE 12

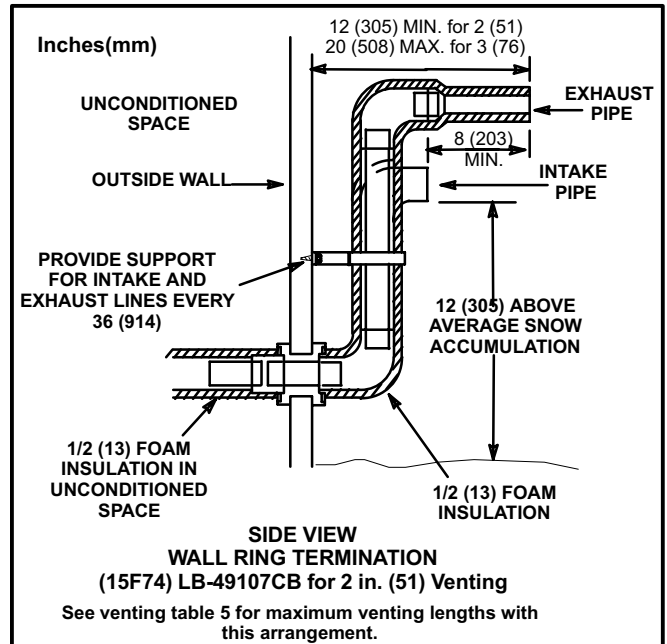


FIGURE 13

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 G32V 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.
- 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 17.

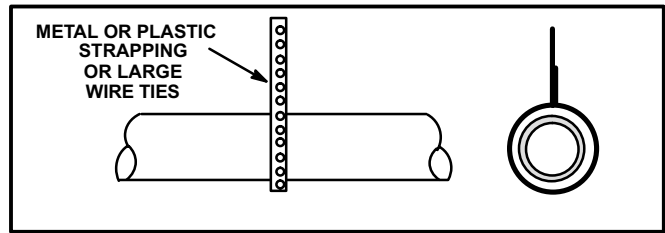


FIGURE 14

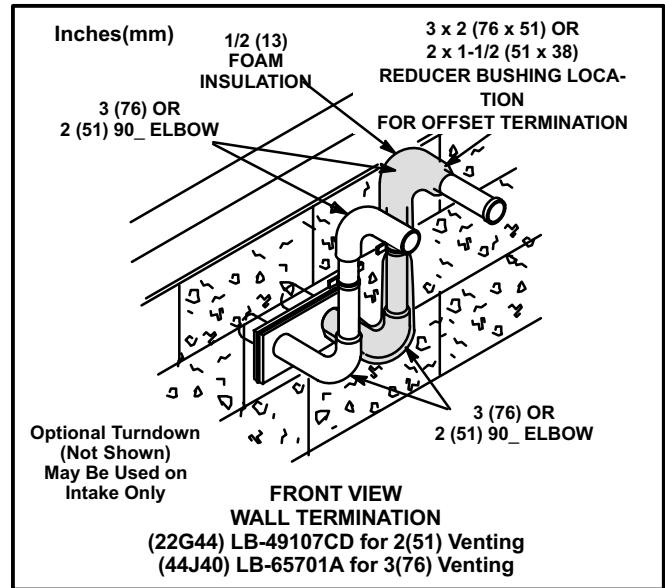


FIGURE 15

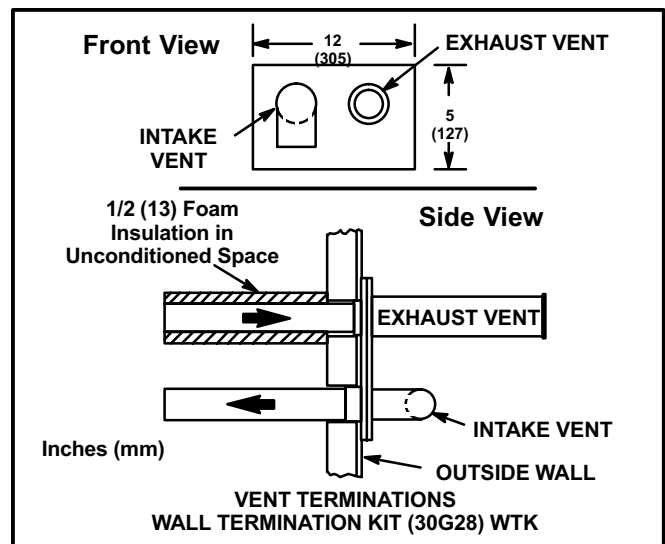


FIGURE 16

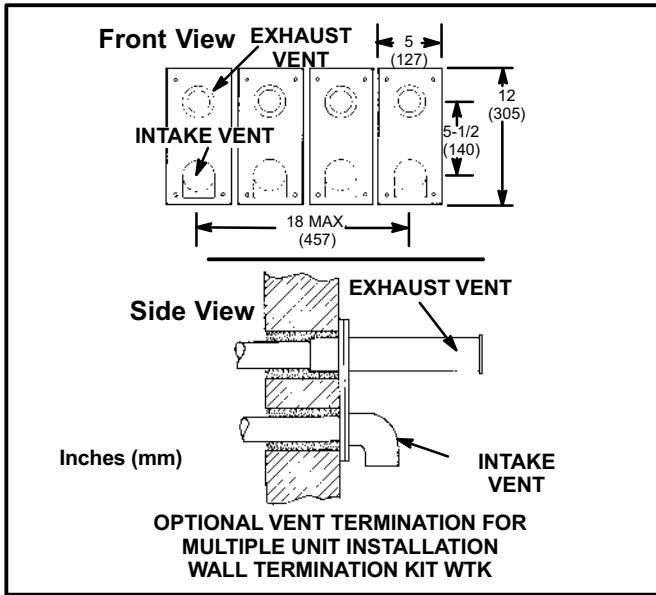


FIGURE 17

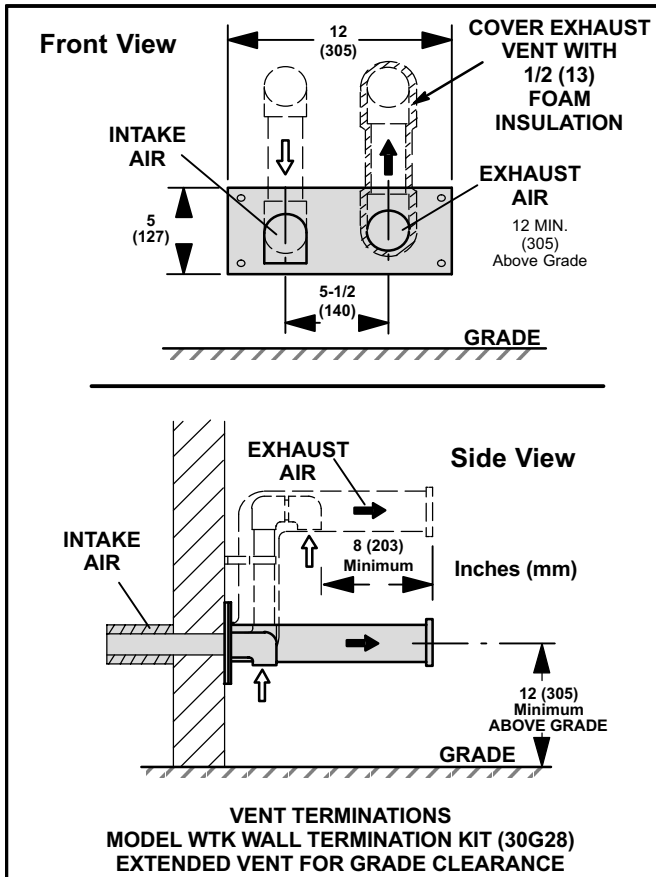


FIGURE 18

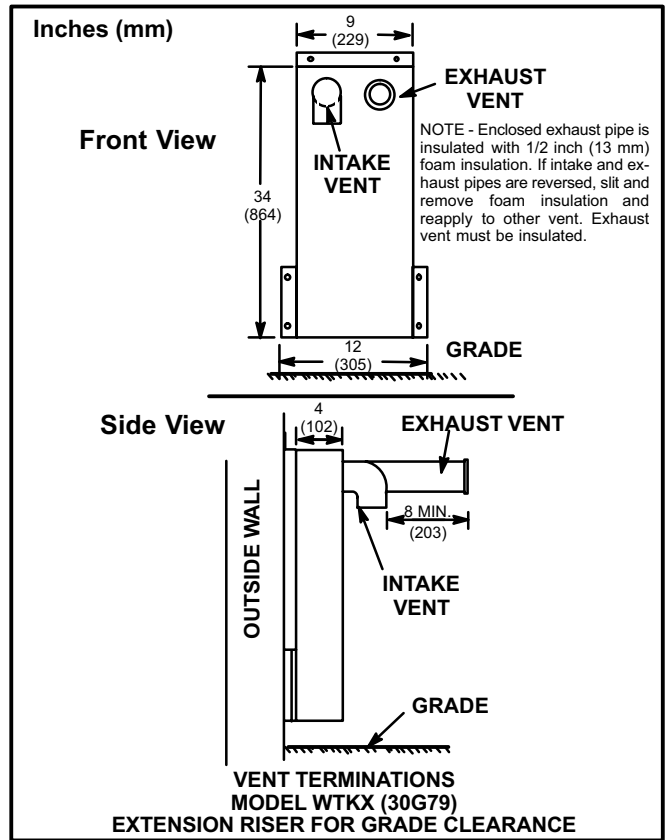


FIGURE 19

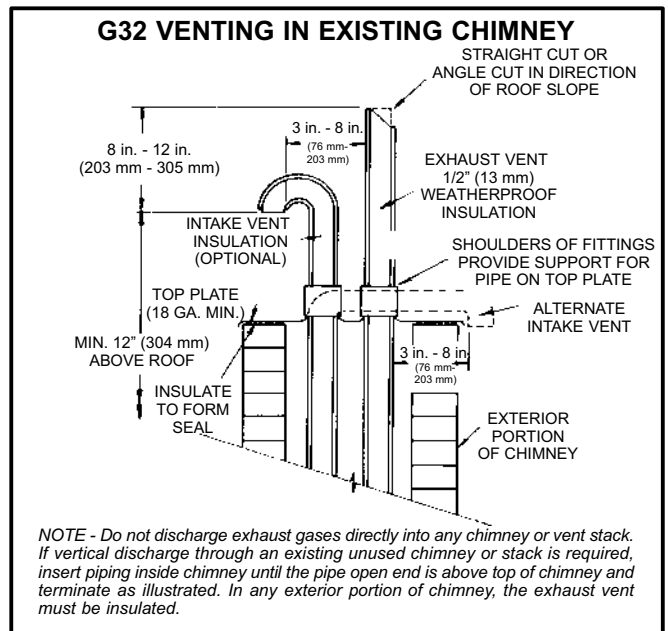


FIGURE 20

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 drainline. 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 of the unit that the condensate will exit.
- 2 - Connect 1/2" (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 21.

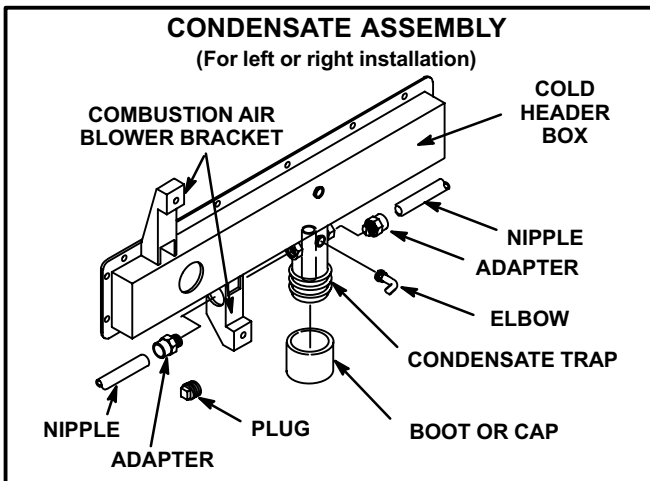


FIGURE 21

- 3 - Use the provided adapter (1/2" mpt X 3/4" PVC) and a field-provided nipple to carry drainage outside the cabinet. A 1/2" CPVC x 1/2" MPT adapter and 1/2" 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.

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.

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 22.

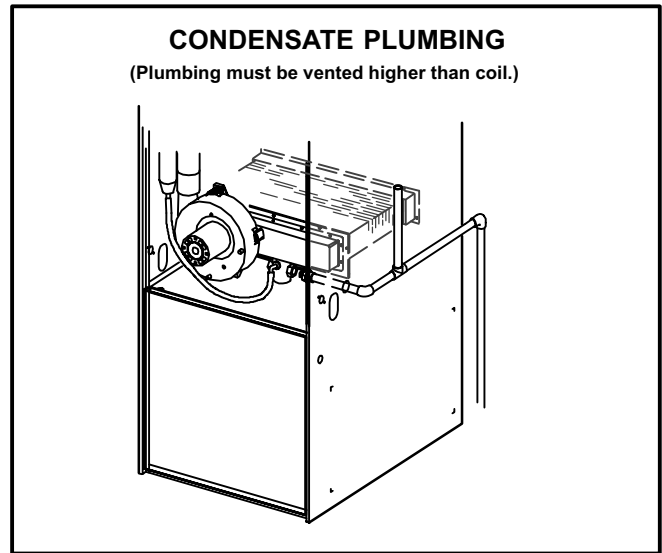


FIGURE 22

- 6 - Connect condensate drain line [1/2" (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 condensate trap to the drain. If drain level is above condensate outlet, use a condensate pump to pump 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 trap and condensate line. Heating cable kit is available from Lennox in various lengths; 6 feet (1.8 m) - kit no. 26K68; 24 feet (7.3 m) - kit no. 26K99; and 50 feet (15.2 m) - kit no. 26K70. Also available from Lennox: 1/2" (12.7 mm) glass fiber tape - 39G04; 2" (50.8 mm) plum foil tape - 39G03.

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 6 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.

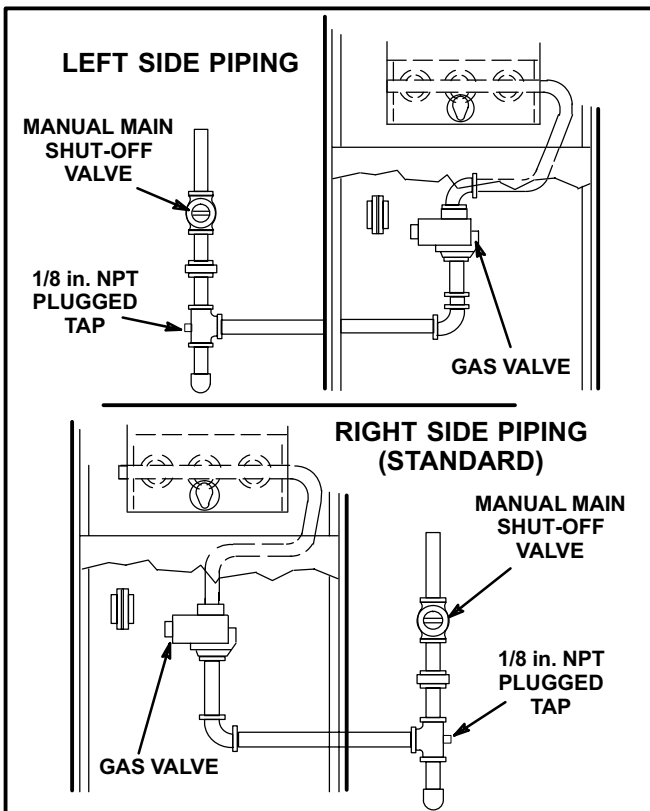


FIGURE 23

- 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 - In some localities, 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.

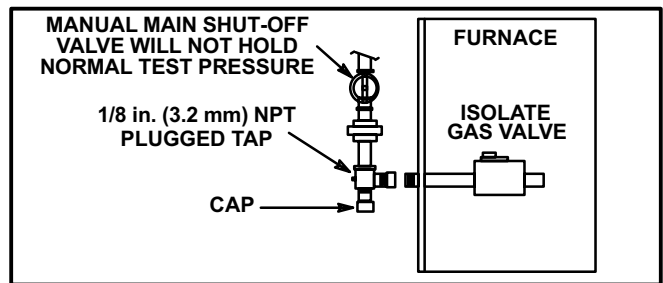


FIGURE 24

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.

⚠ IMPORTANT

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 24.

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).

**TABLE 6
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)	460 (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.

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.

Refer to figure 27 for schematic wiring diagram and troubleshooting, figure 28 for point-to-point field wiring and figure 29 for a detailed illustration of the Surelight integrated control.

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 - Select circuit protection and wire size according to the unit nameplate. The power supply wiring must meet Class 1 restrictions.
- 2 - A snaphole bushing is provided to seal around the wiring as it enters the cabinet. A snaphole plug is provided to seal the unused wire entry hole.

- 3 - Install a separate disconnect switch (protected by either a fuse or circuit breaker) near the unit so that power can be turned off for servicing.

- 4 - Install field make-up box on either side, inside or out of the cabinet. Knockouts are provided in box and cabinet to facilitate wiring. See figures 25 and 26.

To ensure proper grounding of the furnace, two lockwashers are included in the electrical make-up box bag assembly. Place each lockwasher on a securing screw before installing the make-up box. Make sure the lockwasher 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 the lockwasher.

- 5 - Remove cap from knockout in blower deck on the same side as the installed make-up box.
- 6 - Insert the three-pin (P69) plug from the control box into the knockout provided in the blower deck.
- 7 - Connect jack (J69) from make-up box to jack plug in blower deck.
- 8 - Before connecting the thermostat or the power wiring, check to make sure the wires will be long enough for servicing at a later date. Remove the blower access panel to check the length of the wire.
- 9 - Electrically ground unit in accordance with local codes or, in the absence of local codes, according to 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.

⚠ IMPORTANT

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

⚠ CAUTION

Bundle all wires connected to control board in such a way that drip loops are formed. Drip loops direct damaging moisture away from control board.

INTERIOR MAKE-UP BOX INSTALLATION

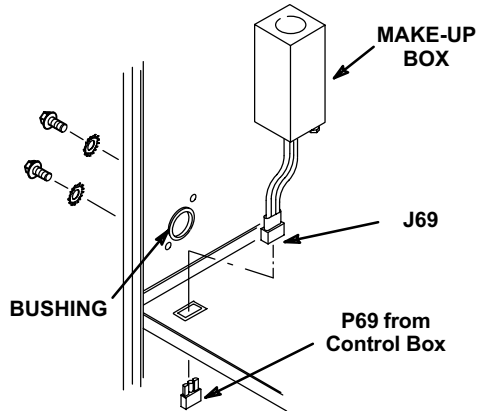


FIGURE 25

EXTERIOR MAKE-UP BOX INSTALLATION

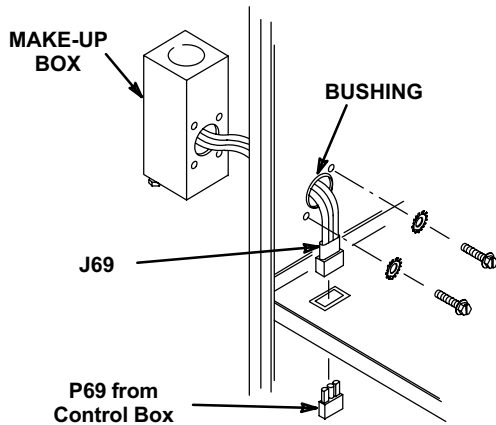


FIGURE 26

- 10 - One line voltage "EAC" terminal is provided on the furnace control board. Any electronic air cleaner rated up to one amp can be connected to this terminal with the neutral leg of the circuit being connected to the neutral "EAC" terminal. See figure 29 for control board configuration. This terminal is energized when the indoor blower is operating.
- 11 - One line voltage "HUM" terminal is provided on the furnace control board. Any humidifier rated up to one amp can be connected to this terminal with the neutral leg of the circuit being connected to the neutral "HUM" terminal. See figure 29 for control board configuration. This terminal is energized in the heating mode whenever the combustion air inducer is operating.
- 12 - Install room thermostat according to instructions provided with thermostat. The furnace may be controlled by either a single- or two-stage thermostat. If furnace is being used with heat pump refer to FM21 installation instruction.
- 13 - Complete wiring connections to equipment using wiring diagrams provided with unit and figures 27 and 28. Use 18-gauge wire or larger that is suitable for Class II rating for thermostat connections. See table 7 for diagrams for specific applications.

Indoor Blower Speeds

- 1 - When the thermostat is set to "FAN ON," the indoor blower will run continuously at approximately 38% of the second-stage cooling speed when there is no cooling or heating demand.
- 2 - When the G32V unit is running in the heating mode, the indoor blower will run on the heating speed designated by the positions of dip switches 11 and 12.
- 3 - When there is a cooling demand, the indoor blower will run on the cooling speed designated by the positions of dip switches 5 and 6.

TYPICAL G32V SCHEMATIC WIRING DIAGRAM

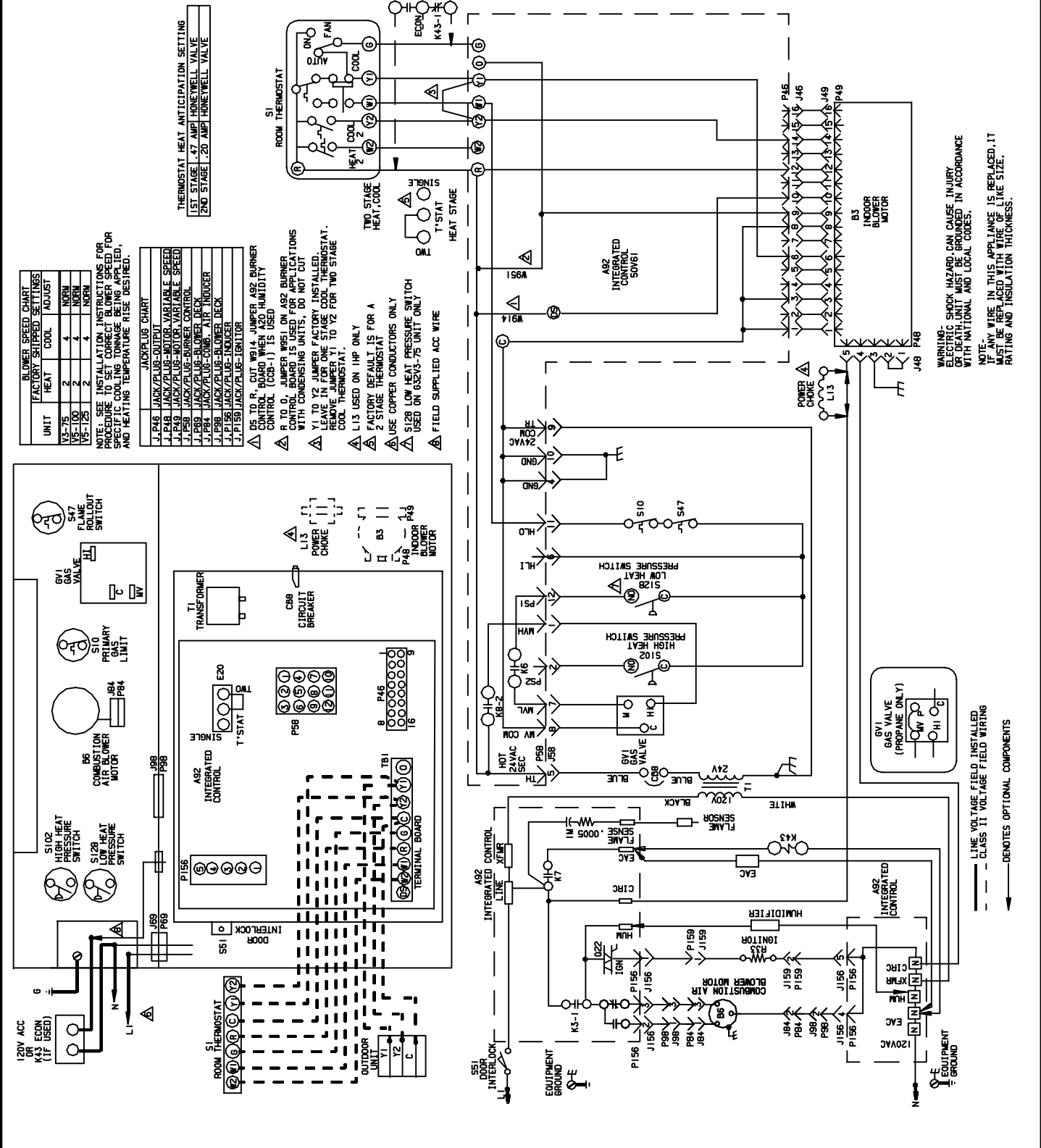


FIGURE 27

TYPICAL G32V FIELD WIRING DIAGRAM

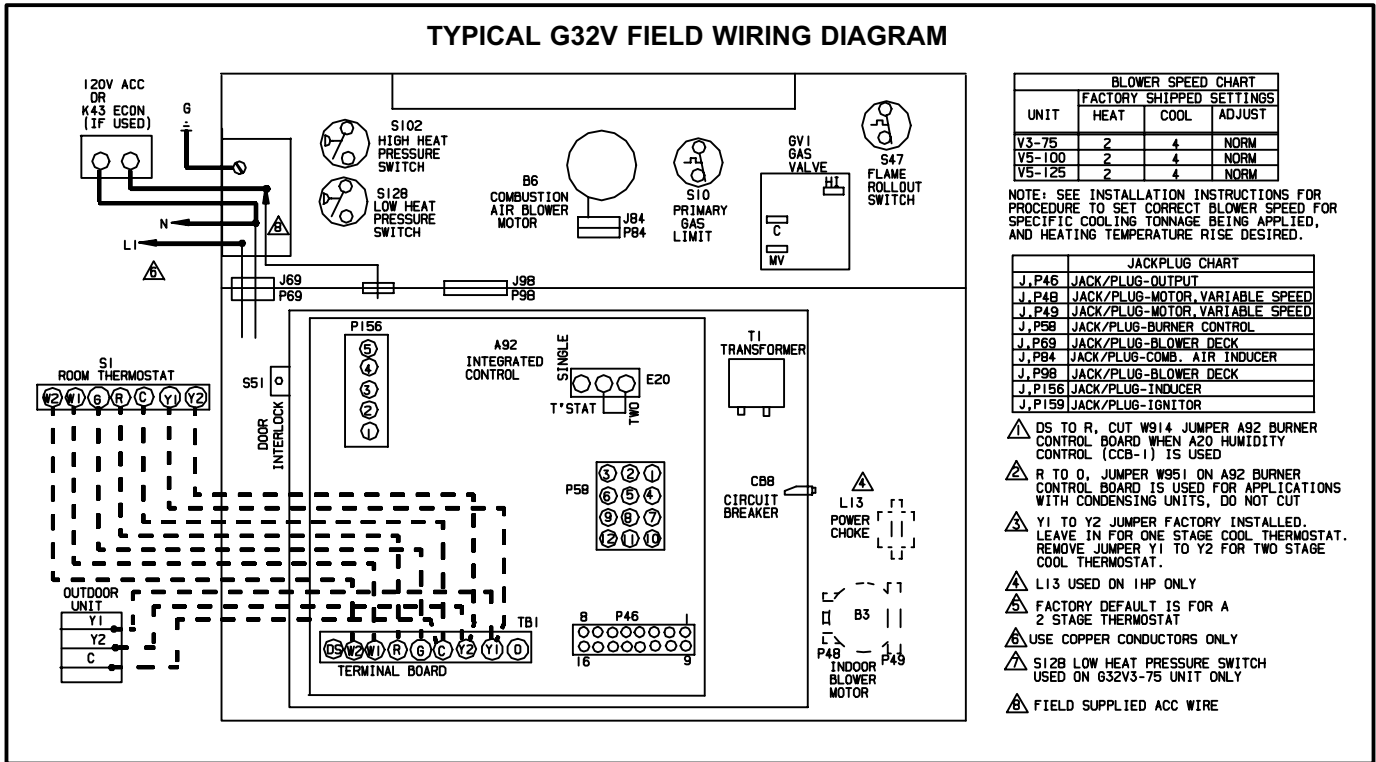


FIGURE 28

TABLE 7
Field Wiring Applications

Thermostat	Jumper Settings (See figure 29)				Wiring Connections																																
	E20	Term. Strip Y1 to Y2	W914	W951																																	
1 Heat / 1 Cool <i>NOTE - Use dip switch 3 to set second-stage heat ON delay. ON-10 minutes. OFF-15 minutes.</i>	SINGLE	Yes	Intact	Intact	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">S1 T'STAT</td> <td style="text-align: center;">CONTROL TERM. STRIP</td> <td style="text-align: center;">OUTDOOR UNIT</td> </tr> <tr> <td style="text-align: center;">(DS)</td> <td style="text-align: center;">(W2)</td> <td></td> </tr> <tr> <td style="text-align: center;">(W) --- (W1)</td> <td style="text-align: center;">(R)</td> <td></td> </tr> <tr> <td style="text-align: center;">(R) --- (R)</td> <td style="text-align: center;">(G)</td> <td></td> </tr> <tr> <td style="text-align: center;">(G) --- (G)</td> <td style="text-align: center;">(C) --- (C)</td> <td style="text-align: center;">(C)</td> </tr> <tr> <td style="text-align: center;">(C) --- (C)</td> <td style="text-align: center;">(Y2) --- (Y1)</td> <td style="text-align: center;">(Y)</td> </tr> <tr> <td style="text-align: center;">(Y) --- (Y1)</td> <td style="text-align: center;">(O)</td> <td></td> </tr> <tr> <td style="text-align: center;">(O) --- (O)</td> <td></td> <td></td> </tr> </table>	S1 T'STAT	CONTROL TERM. STRIP	OUTDOOR UNIT	(DS)	(W2)		(W) --- (W1)	(R)		(R) --- (R)	(G)		(G) --- (G)	(C) --- (C)	(C)	(C) --- (C)	(Y2) --- (Y1)	(Y)	(Y) --- (Y1)	(O)		(O) --- (O)										
S1 T'STAT	CONTROL TERM. STRIP	OUTDOOR UNIT																																			
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(Y) --- (Y1)	(O)																																				
(O) --- (O)																																					
1 Heat / 1 Cool with CCB1 <i>NOTE - Use dip switch 3 to set second-stage heat ON delay. ON-10 minutes. OFF-15 minutes.</i>	SINGLE	Yes	Cut	Intact	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">S1 T'STAT</td> <td style="text-align: center;">CCB1</td> <td style="text-align: center;">CONTROL TERM. STRIP</td> <td style="text-align: center;">OUTDOOR UNIT</td> </tr> <tr> <td style="text-align: center;">(DS) --- (DS)</td> <td></td> <td style="text-align: center;">(W2)</td> <td></td> </tr> <tr> <td style="text-align: center;">(W) --- (W1) --- (W1)</td> <td></td> <td style="text-align: center;">(R)</td> <td></td> </tr> <tr> <td style="text-align: center;">(R) --- (R) --- (R)</td> <td></td> <td style="text-align: center;">(G)</td> <td></td> </tr> <tr> <td style="text-align: center;">(G) --- (G) --- (C)</td> <td></td> <td style="text-align: center;">(C) --- (C)</td> <td style="text-align: center;">(C)</td> </tr> <tr> <td style="text-align: center;">(C) --- (C)</td> <td></td> <td style="text-align: center;">(Y2) --- (Y1)</td> <td style="text-align: center;">(Y)</td> </tr> <tr> <td style="text-align: center;">(Y) --- (Y1) --- (Y1)</td> <td></td> <td style="text-align: center;">(O)</td> <td></td> </tr> <tr> <td style="text-align: center;">(O) --- (O)</td> <td></td> <td></td> <td></td> </tr> </table>	S1 T'STAT	CCB1	CONTROL TERM. STRIP	OUTDOOR UNIT	(DS) --- (DS)		(W2)		(W) --- (W1) --- (W1)		(R)		(R) --- (R) --- (R)		(G)		(G) --- (G) --- (C)		(C) --- (C)	(C)	(C) --- (C)		(Y2) --- (Y1)	(Y)	(Y) --- (Y1) --- (Y1)		(O)		(O) --- (O)			
S1 T'STAT	CCB1	CONTROL TERM. STRIP	OUTDOOR UNIT																																		
(DS) --- (DS)		(W2)																																			
(W) --- (W1) --- (W1)		(R)																																			
(R) --- (R) --- (R)		(G)																																			
(G) --- (G) --- (C)		(C) --- (C)	(C)																																		
(C) --- (C)		(Y2) --- (Y1)	(Y)																																		
(Y) --- (Y1) --- (Y1)		(O)																																			
(O) --- (O)																																					

TABLE 7
Field Wiring Applications (Continued)

Thermostat	Jumper Settings (See figure 29)				Wiring Connections
	E20	Term. Strip Y1 to Y2	W914	W951	
1 Heat / 2 Cool <i>NOTE - Use dip switch 3 to set second-stage heat ON delay. ON-10 minutes. OFF-15 minutes.</i>	SINGLE	No	Intact	Intact	<p>Diagram showing connections between S1 T'STAT, CONTROL TERM. STRIP, and OUTDOOR UNIT terminals. Terminals include DS, W2, W1, R, G, C, Y2, Y1, and O. Connections are shown as follows: W1 to W1, R to R, G to G, C to C, Y2 to Y2, Y1 to Y1, and O to O.</p>
1 Heat / 2 Cool with CCB1 <i>NOTE - Use dip switch 3 to set second-stage heat ON delay. ON-10 minutes. OFF-15 minutes.</i>	SINGLE	No	Cut	Intact	<p>Diagram showing connections between S1 T'STAT, CCB1, CONTROL TERM. STRIP, and OUTDOOR UNIT terminals. Terminals include DS, W2, W1, R, G, C, Y2, Y1, and O. Connections are shown as follows: DS to DS, W1 to W1, R to R, G to G, C to C, Y2 to Y2, Y1 to Y1, and O to O.</p>
2 Heat / 2 Cool	TWO	No	Intact	Intact	<p>Diagram showing connections between S1 T'STAT, CONTROL TERM. STRIP, and OUTDOOR UNIT terminals. Terminals include DS, W2, W1, R, G, C, Y2, Y1, and O. Connections are shown as follows: W2 to W2, W1 to W1, R to R, G to G, C to C, Y2 to Y2, Y1 to Y1, and O to O.</p>
2 Heat / 2 Cool with CCB1	TWO	No	Cut	Intact	<p>Diagram showing connections between S1 T'STAT, CCB1, CONTROL TERM. STRIP, and OUTDOOR UNIT terminals. Terminals include DS, W2, W1, R, G, C, Y2, Y1, and O. Connections are shown as follows: DS to DS, W2 to W2, W1 to W1, R to R, G to G, C to C, Y2 to Y2, Y1 to Y1, and O to O.</p>

TABLE 7
Field Wiring Applications (Continued)

Thermostat	Jumper Settings (See figure 29)				Wiring Connections
	E20	Term. Strip Y1 to Y2	W914	W951	
2 Heat / 1 Cool	TWO	Yes	Intact	Intact	
FM21 Heat Pump / 1 Cool	SINGLE	Yes	Intact	Cut	<p>*Disconnect existing furnace transformer and replace with 75VA, 24V transformer if defrost option to be used.</p> <p>75VA, 24V TRANSFORMER*</p> <p>NOTE - Wiring connections to outdoor unit and thermostat made at FM21 control board per FM21 instructions.</p> <p>NOTE - Remove Y1/Y2 jumper for two-stage cooling.</p>
Harmony Application* 2 Heat / 1 Cool	TWO	Yes	Cut	Intact	
Harmony Application* 2 Heat / 2 Cool	TWO	No	Cut	Intact	

*Cut wires at pin positions 2 and 13 of J/P46. Insulate ends to prevent a short. Blower operates on PWM signal generated by Harmony. Harmony overrides blower speed taps. Blower speed varies according to zone demand. Low and high-fire controlled by temperature modulating switch.

Integrated Control Board Settings

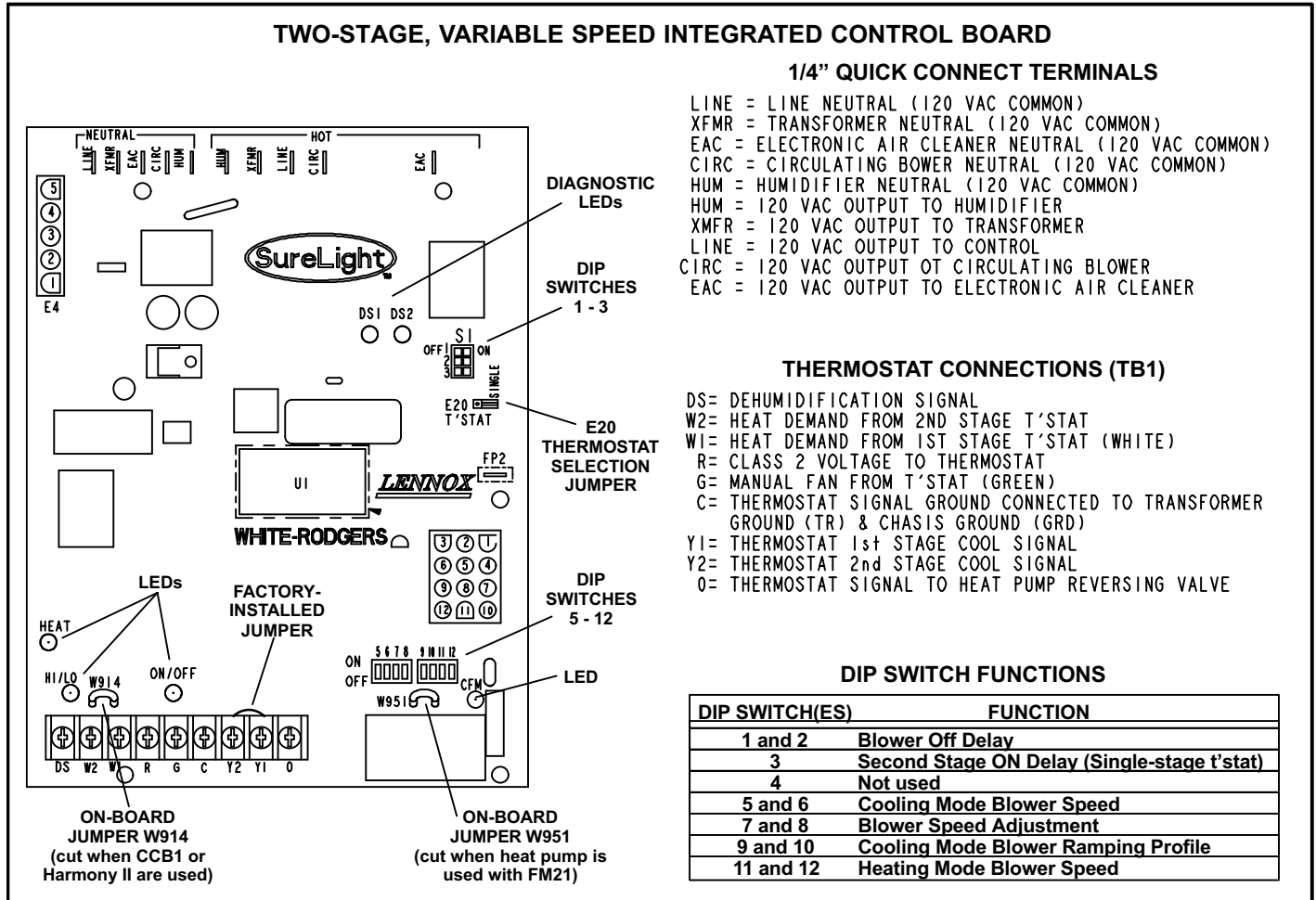


FIGURE 29

G32V units are equipped with a two-stage, variable speed SureLight integrated control. This control manages ignition timing, heating mode fan off delays and in-door blower speeds based on selections made using the control dip switches and jumpers. The control includes an internal watchguard feature which automatically resets the ignition control when it has been locked out because the burner has failed to light. After one hour of continuous thermostat demand for heat, the watchguard will break and remake thermostat demand to the furnace and automatically reset the control to relight the furnace.

Thermostat Selection Jumper (E20)

This unit may be used with either a single-stage or two-stage thermostat. The thermostat selection jumper, located just below dip switches 1 through 3, must be properly positioned for the particular application. The jumper is factory positioned for use with a two-stage thermostat. If a single-stage thermostat is to be used, the jumper must be repositioned.

- a - Select "TWO" for two-stage heating operation controlled by a two-stage heating thermostat (factory setting);
- b - 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.

Dip Switch Settings

Switches 1 and 2 -- Blower Off Delay -- 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 switches 1 and 2 on the integrated control board. The unit is shipped from the factory with a blower-off delay of 90 seconds. The blower off delay affects comfort and is adjustable to satisfy individual applications. Adjust the blower off delay to achieve a supply air temperature between 90° and 110°F at the exact moment that the blower is de-

energized. Longer off delay settings provide lower supply air temperatures; shorter settings provide higher supply air temperatures. The table below provides the blower off timings that will result from different switch settings.

**TABLE 8
Blower Off Delay Switch Settings**

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

Switch 3 -- Second Stage Delay (Used with Single-Stage Thermostat Only) -- This switch is used to determine the second stage on delay when a single-stage thermostat is being used. The switch is factory-set in the ON position, which provides a 10-minute delay before second-stage heat is initiated. If the switch is toggled to the OFF position, it will provide a 15-minute delay before second-stage heat is initiated. This switch is only activated when the thermostat selector jumper is positioned for SINGLE-stage thermostat use.

Switch 4 -- Not used in G32V application.

Switches 5 and 6 -- Cooling Mode Blower Speed -- Switches 5 and 6 are used to select cooling blower motor speed. The unit is shipped from the factory with the dip switches positioned for high speed (4) indoor blower motor operation during the cooling mode. The table below provides the cooling mode blower speeds that will result from different switch settings. Refer to tables 13 through 13 for corresponding cfm values.

**TABLE 9
Cooling Mode Blower Speeds**

Speed	Switch 5	Switch 6
1 - Low	On	On
2 - Medium Low	Off	On
3 - Medium High	On	Off
4 - High (Factory)	Off	Off

Switches 7 and 8 -- Blower Speed Adjustment -- Switches 7 and 8 are used to select blower speed adjustment settings. The unit is shipped from the factory with the dip switches positioned for NORMAL (no) adjustment. The dip switches may be positioned to adjust the blower speed by -15% to better suit the application. The table below provides blower speed adjustments that will result from different switch settings. Refer to tables 13 and 14 for corresponding cfm values.

**TABLE 10
Blower Speed Adjustment**

Adjustment	Switch 7	Switch 8
NORMAL (Factory)	Off	Off
-15% (approx.)	Off	On

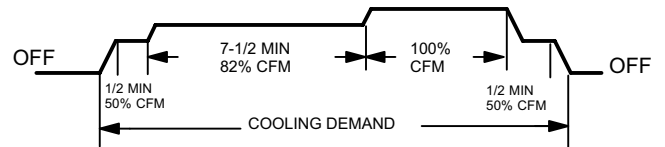
Switches 9 and 10 -- Cooling Mode Blower Speed Ramping -- Switches 9 and 10 are used to select cooling mode blower speed ramping options. Blower speed ramping may be used to enhance dehumidification performance. The switches are factory set at option A which has the greatest effect on blower motor performance. The table below provides the cooling mode blower speed ramping options that will result from different switch settings. The cooling mode blower speed ramping options are detailed below.

**TABLE 11
Cooling Mode Blower Speed Ramping**

Ramping Option	Switch 9	Switch 10
A (Factory)	Off	Off
B	On	Off
C	Off	On
D	On	On

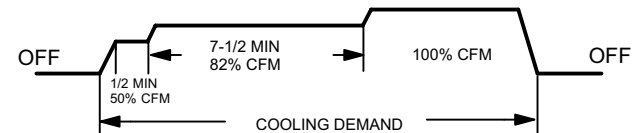
Ramping Option A (Factory Selection)

- Motor runs at 50% for 1/2 minute.
- Motor then runs at 82% for approximately 7-1/2 minutes.
- If demand has not been satisfied after 7-1/2 minutes, motor runs at 100% until demand is satisfied.
- Once demand is met, motor runs at 50% for 1/2 minute.
- Motor ramps down to off.



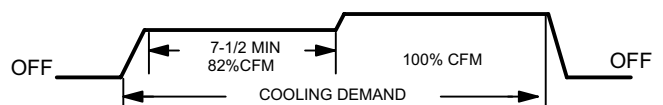
Ramping Option B

- Motor runs at 50% for 1/2 minute.
- Motor then runs at 82% for approximately 7-1/2 minutes.
- If demand has not been satisfied after 7-1/2 minutes, motor runs at 100% until demand is satisfied.
- Once demand is met, motor ramps down to off.



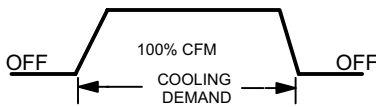
Ramping Option C

- Motor runs at 82% for approximately 7-1/2 minutes.
- If demand has not been satisfied after 7-1/2 minutes, the motor runs at 100% until demand is satisfied.
- Once demand is met, motor ramps down to off.



Ramping Option D

- Motor runs at 100% until demand is satisfied.
- Once demand is met, motor ramps down to off.



Switches 11 and 12 -- Heating Mode Blower Speed --

Switches 11 and 12 are used to select heating mode blower motor speed. The unit is shipped from the factory with the dip switches positioned for medium low (2) speed indoor blower motor operation during the heating mode. The table below provides the heating mode blower speeds that will result from different switch settings. Refer to tables 13 and 14 for corresponding cfm values.

**TABLE 12
Heating Mode Blower Speeds**

Speed	Switch 11	Switch 12
1 - Low	On	On
2 - Medium Low (Factory)	Off	On
3 - Medium High	On	Off
4 - High	Off	Off

On-Board Jumper W914

On-board jumper W914, which connects terminals DS and R on the integrated control board, must be cut when the furnace is installed with either the Harmony II zone control board or the CCB1 EfficiencyPlus humidity control. Refer to table 15 for operation sequence in applica-

tions including a G32V, CCB1 and single-speed outdoor unit. Table 16 gives the operation sequence in applications with a two-speed outdoor unit.

On-Board Jumper W951

On-board jumper W951, which connects terminals R and O on the integrated control board, must be cut when the furnace is installed in applications which include a heat pump unit and the FM21 FuelMaster control board.

Factory-Installed Jumper Y1 to Y2

A factory-installed jumper from Y1 to Y2 terminals on the integrated control board terminal strip must be removed if two-stage cooling will be used.

Diagnostic LEDs (DS1 and DS2)

Two diagnostic LEDs are located on the two-stage, variable speed integrated control just to the left of the first bank of dip switches. The LED flashes correspond with diagnostic codes detailed on page 35.

Status LEDs (HEAT, HI/LO, ON/OFF and CFM)

The integrated control includes four LEDs which indicate operating status. The green ON/OFF LED is lit any time the blower is operating. The green CFM LED indicates the blower motor speed. Count the number of blinks between the two-second pauses to determine the CFM. Each blink represents approximately 100 CFM. The yellow HI/LO LED is lit when the W914 (DS to R) jumper **has not** been clipped for CCB1 or Harmony operation. The yellow HEAT LED is lit when the indoor blower is operating at the HEATING speed.

TABLE 13
G32V3-75 BLOWER MOTOR PERFORMANCE
0.0" to 0.8" w.g. (0 through 200 Pa) External Static Pressure Range

"Adjust" Setting	Blower Speed Adjustment Settings (Switches 5 and 6)															
	Cool															
	Low Speed								High Speed							
	1		2		3		4		1		2		3		4	
	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s
Norm	880	415	930	440	980	465	1040	490	1060	500	1105	520	1260	595	1330	630
- ¹	775	365	810	380	850	400	910	430	930	440	970	460	1070	505	1130	535

"Adjust" Setting	Blower Speed Adjustment Settings (Switches 7 and 8)															
	Heat															
	Low Speed								High Speed							
	1		2		3		4		1		2		3		4	
	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s
Norm	945	446	1025	484	1125	531	1270	599	1080	510	1172	533	1286	607	1452	685
- ¹	803	379	871	411	956	451	1080	510	918	433	996	470	1093	516	1234	582

¹ 15% lower motor speed than NORM switch setting.

NOTE - The effect of static pressure and filter resistance is included in air volumes shown.

NOTE - Continuous Fan only speed is approximately 800 cfm (380 L/s) - non adjustable.

NOTE - Lennox Harmony II™ zone control applications - MAX CFM is determined by COOL switch setting with a minimum of approximately 850 cfm (400 L/s) for all positions.

TABLE 14
G32V5-100/125 BLOWER MOTOR PERFORMANCE
0.0" to 0.8" w.g. (0 through 200 Pa) External Static Pressure Range

"Adjust" Setting	Blower Speed Adjustment Settings (Switches 5 and 6)															
	Cool															
	Low Speed								High Speed							
	1 ²		2 ²		3		4		1 ²		2 ²		3		4	
	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s
Norm	1140	540	1250	590	1440	680	1550	730	1620	765	1820	860	2000	945	2100	990
- ¹	970	455	1060	500	1280	605	1320	595	1380	650	1550	730	1700	800	1780	840

"Adjust" Setting	Blower Speed Adjustment Settings (Switches 7 and 8)															
	Heat															
	Low Speed								High Speed							
	1		2		3		4		1		2		3		4	
	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s
Norm	1140	540	1250	590	1440	680	1550	730	1560	735	1720	810	2030	960	2150	1015
- ¹	970	455	1060	500	1280	605	1320	595	1330	660	1460	690	1730	815	1830	865

¹ 15% lower motor speed than NORM switch setting.

² G32V5-125 Models Only - Do not set switches for position #1 (at NORM or "-" setting) or position #2 (at "-" setting) for HEAT speed.

NOTE - The effect of static pressure and filter resistance is included in air volumes shown.

NOTE - Continuous Fan only speed is approximately 1150 cfm (545 L/s) - non adjustable.

NOTE - Lennox Harmony II™ zone control applications - MAX CFM is determined by COOL switch setting with a minimum of approximately 1140 cfm (540 L/s) for all positions.

Unit Start-Up

FOR YOUR SAFETY READ BEFORE LIGHTING

⚠ 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 LIGHTING 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.

This unit is equipped with a gas control knob. Use only your hand to turn the gas control knob. Never use tools. If knob 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.

G32V units are equipped with a SureLight 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 SureLight 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 - Turn gas valve knob to **OFF** position. See figure 30.
- 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.

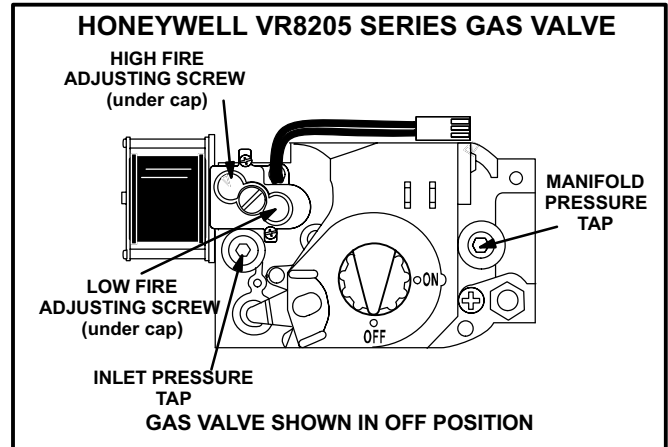


FIGURE 30

- 8 - Turn gas valve knob to **ON** position.
- 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 given in the "Turning Off Gas To Unit" section 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 - Turn gas valve knob to **OFF** position. 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 Two-Stage Thermostat

A - Heating Sequence -- Control Board Thermostat Selection Jumper (E20) in "Two-Stage" Position (Factory Setting)

- 1 - On a call for heat, thermostat first-stage contacts close sending a signal to the integrated control. The integrated control runs a self-diagnostic program and checks high temperature limit switch for normally closed contacts and pressure switch(es) for normally open contacts. The combustion air inducer is energized at low speed and the humidifier terminal is energized.
- 2 - Once the control receives a signal that the low pressure switch has closed, the combustion air inducer begins a 15-second pre-purge in low speed.

- 3 - After the pre-purge is complete, a 20-second initial ignitor warm-up period begins. The combustion air inducer continues to operate at low speed.
- 4 - After the 20-second warm-up period has ended, the gas valve is energized on low fire (first stage) and ignition occurs. At the same time, the control module sends a signal to begin an indoor blower 45-second ON-delay. When the delay ends, the indoor blower motor is energized on the low-fire heating speed. The furnace will continue this operation as long as the thermostat has a first-stage heating demand.
- 5 - If second-stage heat is required, the thermostat second-stage heat contacts close and send a signal to the integrated control. The integrated control initiates a 30-second second-stage recognition delay.
- 6 - At the end of the recognition delay, the integrated control energizes the combustion air inducer at high speed. The control also checks the high-fire (second stage) pressure switch to make sure it is closed. The high fire (second stage) gas valve is energized and the indoor blower motor is energized for operation at the high fire heating speed.
- 7 - When the demand for high fire (second stage) heat is satisfied, the combustion air inducer is switched to the low-fire heating speed and the high-fire (second stage) gas valve is de-energized. The low-fire (first stage) gas valve continues operation. The indoor blower motor is switched to the low-fire heating speed.
- 8 - When the thermostat demand for low-fire (first stage) heat is satisfied, the gas valve is de-energized and the field-selected indoor blower off delay begins. The combustion air inducer begins a 5-second post-purge period.
- 9 - When the combustion air post-purge period is complete, the inducer and humidifier terminal are de-energized. The indoor blower is de-energized at the end of the off delay.

Applications Using A Single-Stage Thermostat

B - Heating Sequence -- Control Board Thermostat Selection Jumper (E20) in "Single-Stage" Position

NOTE - In these applications, two-stage heat will be initi-

ated by the integrated control if heating demand has not been satisfied after the field adjustable period (10 or 15 minutes).

- 1 - On a call for heat, thermostat first-stage contacts close sending a signal to the integrated control. The integrated control runs a self-diagnostic program and checks high temperature limit switch for normally closed contacts and pressure switch(es) for normally open contacts. The combustion air inducer is energized at low speed and the humidifier terminal is energized.
- 2 - Once the control receives a signal that the low pressure switch has closed, the combustion air inducer begins a 15-second pre-purge in low speed.
- 3 - After the pre-purge is complete, a 20-second initial ignitor warm-up period begins. The combustion air inducer continues to operate at low speed.
- 4 - After the 20-second warm-up period has ended, the gas valve is energized on low fire (first stage) and ignition occurs. At the same time, the control module sends a signal to begin an indoor blower 45-second ON-delay. When the delay ends, the indoor blower motor is energized on the low-fire heating speed. The integrated control also initiates a second-stage on delay (factory-set at 10 minutes; adjustable to 15 minutes).
- 5 - If the heating demand continues beyond the second-stage on delay, the integrated control energizes the combustion air inducer at high speed. The control also checks the high-fire (second stage) pressure switch to make sure it is closed. The high-fire (second stage) gas valve is energized and the indoor blower motor is energized for operation at the high fire heating speed.
- 6 - When the thermostat heating demand is satisfied, the combustion air inducer begins a 5-second low speed post-purge. The field-selected indoor blower off delay begins. The indoor blower operates at the low-fire heating speed.
- 7 - When the combustion air post-purge period is complete, the inducer and humidifier terminal are de-energized. The indoor blower is de-energized at the end of the off delay.

**TABLE 15
OPERATING SEQUENCE
G32V, CCB1 and Single-Speed Outdoor Unit**

OPERATING MODE	SYSTEM DEMAND		SYSTEM RESPONSE	
	Thermostat Demand	*Relative Humidity (EfficiencyPlus Lights)	Blower CFM (COOL)	Comments
Normal operation	Y1	No demand. Humidity level is acceptable	COOL	Compressor demand and indoor blower speed controlled by thermostat demand.
*Call for humidity removal during cooling demand	Y1	Humidity level rises above setpoint. Demand initiated.	77%/74% of COOL	Call for dehumidification initiated by CCB1 control. Indoor blower speed reduced by CCB1 control.
Dehumidification demand satisfied during cooling demand.	Y1	Humidity level falls below setpoint. No demand	COOL	When humidity demand is satisfied, blower speed immediately increases to the COOL CFM to hasten the end of the cycle.
Call for cooling after call for humidity removal.	None	Humidity level above setpoint. Demand initiated.	Off	Dehumidification mode begins when relative humidity is greater than setpoint.
	Y1	Humidity level above setpoint. Demand initiated.	77%/74% of COOL	
Humidity demand satisfied between thermostat demands (unit off cycle).	None	Over setpoint (1 or more)	Off	While unit is not operating (no thermostat demand), slide switch is moved down and back up. Blower operates at COOL CFM.
	Y1	Change to acceptable	COOL	

NOTE - When changing unit mode of operation from cooling to heating, indicating lights that are on will stay on until the first thermostat heating demand.

** Reduced blower speed is 77% of COOL for V3 units and 74% of COOL for the V5 units.*

**TABLE 16
OPERATING SEQUENCE
G32V, CCB1 and Two-Speed Outdoor Unit**

OPERATING MODE	SYSTEM DEMAND		SYSTEM RESPONSE		
	Thermostat Demand	*Relative Humidity (EfficiencyPlus Lights)	****Compressor Speed	Blower CFM (COOL)	Comments
Normal operation	Y1	No demand. Acceptable	Low	55% of HIGH COOL	Compressor demand and indoor blower speed controlled by thermostat demand
	Y2	No demand. Acceptable	High	HIGH COOL	
Call for humidity removal during 1st-stage cooling demand	Y1	No demand. Acceptable	Low	55% of HIGH COOL	Dehumidification mode does not begin until after initial thermostat demand is satisfied and new cooling demand is initiated.
	Y1	Humidity level rises slightly (1) above setpoint. Demand initiated.	Low	55% of HIGH COOL	
	Demand satisfied	Humidity level remains slightly (1) above setpoint. Demand continues.	Off	Off	
	Y1	Humidity level remains slightly (1) above setpoint. Demand continues.	High	**77%/74% of HIGH COOL	
Significant increase in humidity during thermostat cooling demand.	Y1	No demand. Acceptable	Low	55% of HIGH COOL	If humidity rises significantly above setpoint, or if slide switch is moved significantly, unit will immediately go into dehumidification mode (in presence of thermostat demand).
	Y1	Humidity level rises significantly (2 or more) above setpoint. Demand initiated.	High	**77%/74% of HIGH COOL	
Humidity demand satisfied during thermostat demand.	Y1	Humidity level above setpoint.	High	**77%/74% of HIGH COOL	When humidity demand is satisfied, blower immediately shifts to the COOL CFM in order to hasten the end of the cycle. Unit can only shift out of high speed compressor operation at beginning of next cycle.
	Y1	Humidity level falls below setpoint. No demand.	High	HIGH COOL	
	None	No demand. Acceptable	Off	Off	
	Y1	No demand. Acceptable	Low	55% of HIGH COOL	
Call for humidity removal during 2nd stage thermostat demand	Y2	No demand. Acceptable	High	HIGH COOL	Blower immediately changes speed in response to thermostat demand.
	Y2	Humidity level rises slightly (1) above setpoint. Demand initiated.	High	**77%/74% of HIGH COOL	
	Y2	No demand. Acceptable	High	HIGH COOL	
*Call for 1st stage cooling after call for humidity removal.	None	Humidity level is slightly (1) above setpoint.	Off	Off	Dehumidification mode (high speed compressor) begins with next thermostat demand after initial demand is satisfied.
	Y1	Humidity level is slightly (1) above setpoint.	Low	55% of HIGH COOL	
Call for 2nd stage cooling after call for humidity removal	None	Humidity level is slightly (1) above setpoint.	Off	Off	Reduced blower speed (dehumidification speed) begins immediately with thermostat demand
	Y2	Humidity level is slightly (1) above setpoint.	High	**77%/74% of HIGH COOL	
Call for cooling after significant increase in humidity	None	Humidity level is significantly above setpoint (2 or more).	Off	Off	If humidity increases significantly over setpoint, or if slide switch is moved, unit immediately goes into dehumidification mode (in presence of thermostat demand).
	Y1 or Y2	Humidity level is significantly above setpoint (2 or more).	High	**77%/74% of HIGH COOL	
Humidity demand satisfied between thermostat demands (unit off cycle).	None	Humidity level is slightly (1) above setpoint.	Off	Off	While unit is not operating (no thermostat demand), slide switch is moved down and back up. Blower and compressor operate at high speed until next thermostat demand.
	Y1 or Y2	Humidity level falls below setpoint. No demand.	High	HIGH COOL	

Note - During mode of operation change from cooling to heating, indicating lights will not change until the first thermostat heating demand.

**IMPORTANT - If power to unit is turned on with CCB1 calling for humidity removal, outdoor unit may be locked into high speed indefinitely. To reset, move the humidity slide switch all the way down then back up to desired setpoint while the unit is running.*

*** Reduced blower speed is 77% of COOL for the V3 units; 74% of COOL for V5.*

****If the two-speed control on a two-speed outdoor unit is set for LATCH 2 (15 minutes) or LATCH 3 (30 minutes), the compressor will latch into high speed after a Y1 demand has occurred for that period of time.*

Gas Pressure Adjustment

TABLE 17
Manifold Pressure (Outlet) in. w.c. (kPa)

No gas pressure adjustment is needed when operating at altitudes from 0 to 4500 ft. (0 to 8 m). See below for correct manifold pressures for altitudes greater than 4500 ft. (1372 m) for natural and L.P. gas.

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
G32V-75 natural	3.5	3.5	3.5	3.5
G32V-100 natural	3.5 (0.87)	3.4 (0.85)	3.3 (0.82)	3.2 (0.80)
G32V-125 natural				
G32V-75L.P.	7.5	7.5	7.5	7.5
G32V-100 L.P.	7.5 (1.90)	7.3 (1.81)	7.1 (1.80)	7.0 (1.74)
G32V-125 L.P.	7.5 (1.90)	7.3 (1.81)	7.1 (1.80)	7.0 (1.74)

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. Maintain a minimum of 4.5 in. w.c. (1.12 kPa) for natural gas or 8.5 inches w.c. (2.11kPa) for LP/propane gas.
- 2 - After line pressure has been checked and adjusted, check high heat regulator pressure. See figure 30 for gas pressure adjustment screw location. High heat manifold pressure for natural and LP/propane gas is given in table 17.

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 31 for differential pressure switch circuitry on 75 kBtuh models. Only 75 kBtuh models are equipped with a second pressure switch. Other models have single pressure switch.
- 3 - Start unit on high heat and allow 5 minutes for unit to reach steady state.
- 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 17.

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

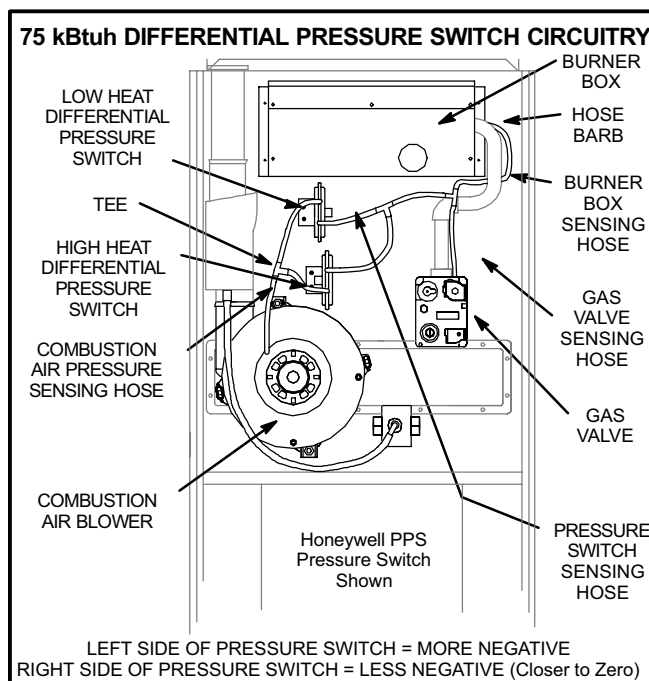


FIGURE 31

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

- 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 17 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 pressure switch(es) are factory-set and should not be adjusted. The -75 is equipped with both a high- and low-heat pressure switch. The -100 and -125 units have a single pressure switch.

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.

Temperature Rise

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

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 ducting or structure.

Electronic Ignition

The SureLight integrated control has an internal watchguard feature. The feature serves as 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 watchguard will break and remake thermostat demand to the furnace and automatically reset the control to relight the furnace.

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.
- 3 - If replacement is necessary, order Lennox part no. 31J81 for 14 inches x 25 inches (356 x 635 mm) filter for G32V-75 units and P-8-7831 for 20 inches x 25 inches (508 x 635 mm) filter for G32V-100 and -125 units.

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 SureLight 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 counterclockwise. 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 inducer at the blower deck. Remove four screws from combustion air inducer and remove flue transition and inducer assembly from cabinet. Take care not to lose the combustion air orifice.
- 16 - Mark and disconnect remaining wiring to heating compartment components.
- 17 - Disengage strain relief bushing from blower deck. Pull bushing and wiring into blower compartment.
- 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 in the 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 - Route heating component wires through hole in blower deck. Reinsert strain relief bushing. Reconnect wires.
- 28 - Reinstall the combustion air inducer. Check to ensure that the plastic orifice in the inducer 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 inducer housing and to the elbow on the cold header (collector) box trap. See figure 31.
- 29 - Reconnect condensate line with adapter to condensate trap. Use fresh Teflon tape to ensure a leak-free joint. Reconnect 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 barbed fitting on the bottom and the tubing from the combustion air inducer to the barbed fitting on the top. See figure 31.
- 32 - Reconnect the sensor and ignitor wires.
- 33 - Reinstall top cap on unit.
- 34 - Reconnect wiring 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 on 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 on 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 operate 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 from 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 has a key hole on each side, so screws do not need to be removed. Remove the cover and set it 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 - Install the ignitor on the opposite side of the burner from the metal button protrusions. Screws that 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 - Reinstall the burner ignitor assembly in the 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 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. Make sure the 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 form a sandwich around the lip. 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 - Reconnect gas valve wiring. 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: G32VQ3-75-5.

Cabinet Parts

Cabinet cap
Blower panel
Upper access panel

Control Panel Parts

Two-stage, variable-speed SureLight control board
Transformer
Circuit breaker
Door interlock switch

Blower Parts

Blower wheel
Motor
Belly-band assembly
Power choke
Blower housing cut-off plate
Blower housing

Heating Parts

Heat exchanger/coil assembly
Gas manifold
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 fire (-75 only)
Pressure switch - low fire
Flame sensor
Sight glass and grommet
Rubber boot trap
Foam manifold gaskets
Two-speed combustion air blower
Condensate pipe plug and adapter
Cold end header (collector) box

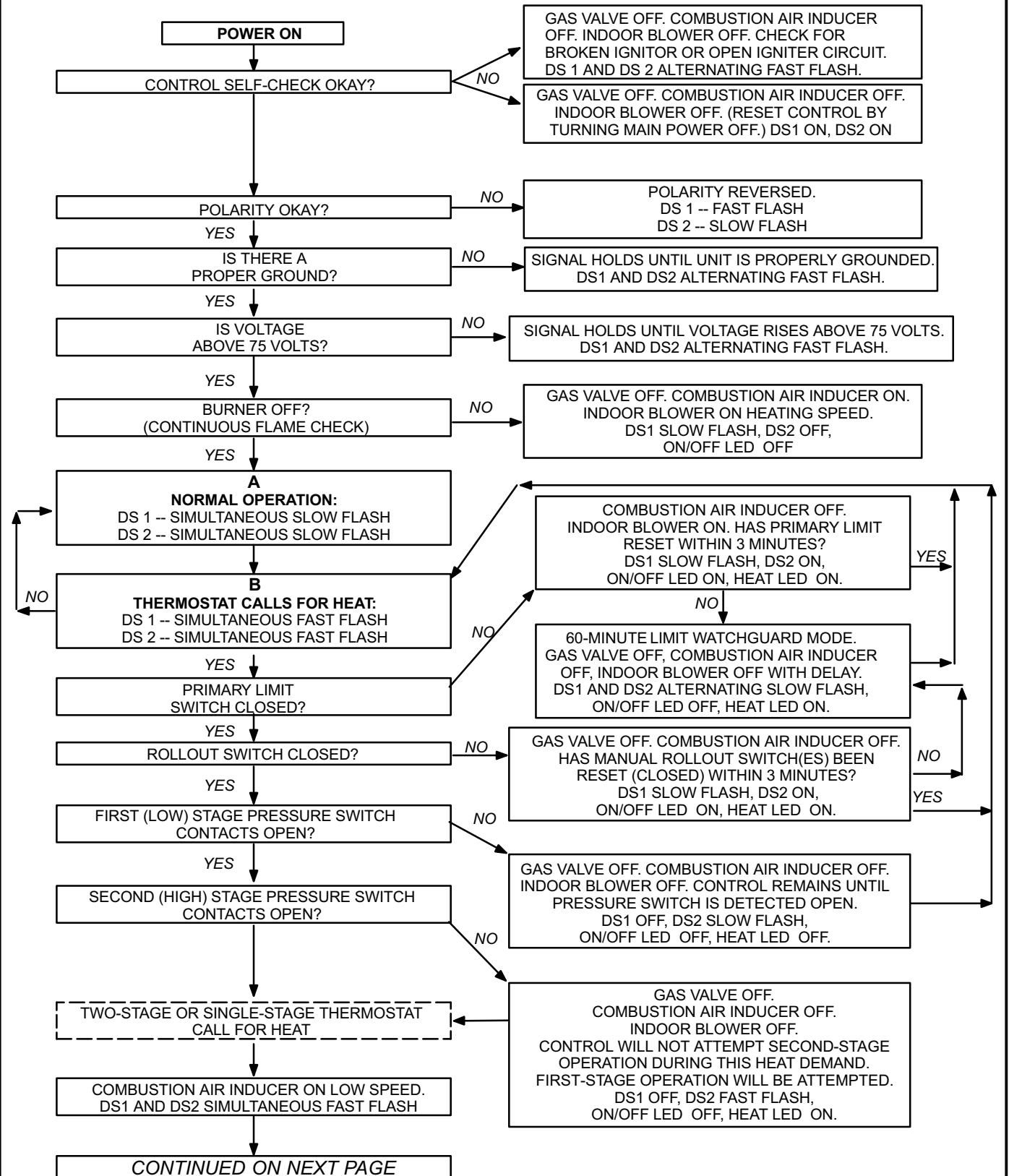
Integrated Control Board Diagnostic Codes

DIAGNOSTIC CODES		
Diagnostic LEDs are labeled DS1 and DS2. See figure 29 for location of diagnostic LEDs.		
DS1	DS2	DESCRIPTION
SIMULTANEOUS SLOW FLASH	SIMULTANEOUS SLOW FLASH	Power on - Normal operation. Also signaled during cooling and continuous fan.
SIMULTANEOUS FAST FLASH	SIMULTANEOUS FAST FLASH	Normal operation - signaled when heating demand initiated at thermostat.
SLOW FLASH	ON	Primary limit or rollout limit switch open. Limits must close within 3 minutes or unit goes into 1 hour Watchguard.
OFF	SLOW FLASH	Low-fire pressure switch open; OR: Blocked inlet/exhaust vent; OR: Low-fire pressure switch closed prior to activation of combustion air inducer.
OFF	FAST FLASH	High-fire pressure switch open (G32V-75 only); OR: Blocked inlet/exhaust vent; OR: High-fire pressure switch closed prior to activation of combustion air inducer.
ALTERNATING SLOW FLASH	ALTERNATING SLOW FLASH	Watchguard -- burners failed to ignite; OR limit open more than 3 minutes; OR lost flame sense 5 times in one heating cycle; OR pressure switch opened 5 times in one heating cycle.
SLOW FLASH	OFF	Flame sensed without gas valve energized.
ON ON OFF	ON OFF ON	Circuit board failure or control wired incorrectly. Check 24 and 115 volts to board.
FAST FLASH	SLOW FLASH	Main power polarity reversed. Switch line and neutral.
SLOW FLASH	FAST FLASH	Low flame signal. Measures below .7 microAmps. Replace flame sense rod.
ALTERNATING FAST FLASH	ALTERNATING FAST FLASH	The following conditions are sensed during the ignitor warm-up period only: 1) Improper main ground; 2) Broken ignitor; OR: Open ignitor circuit; 3) Line voltage below 75 volts. (If voltage lower than 75 volts prior to ignitor warm-up, control will signal waiting on call from thermostat, and will not respond.

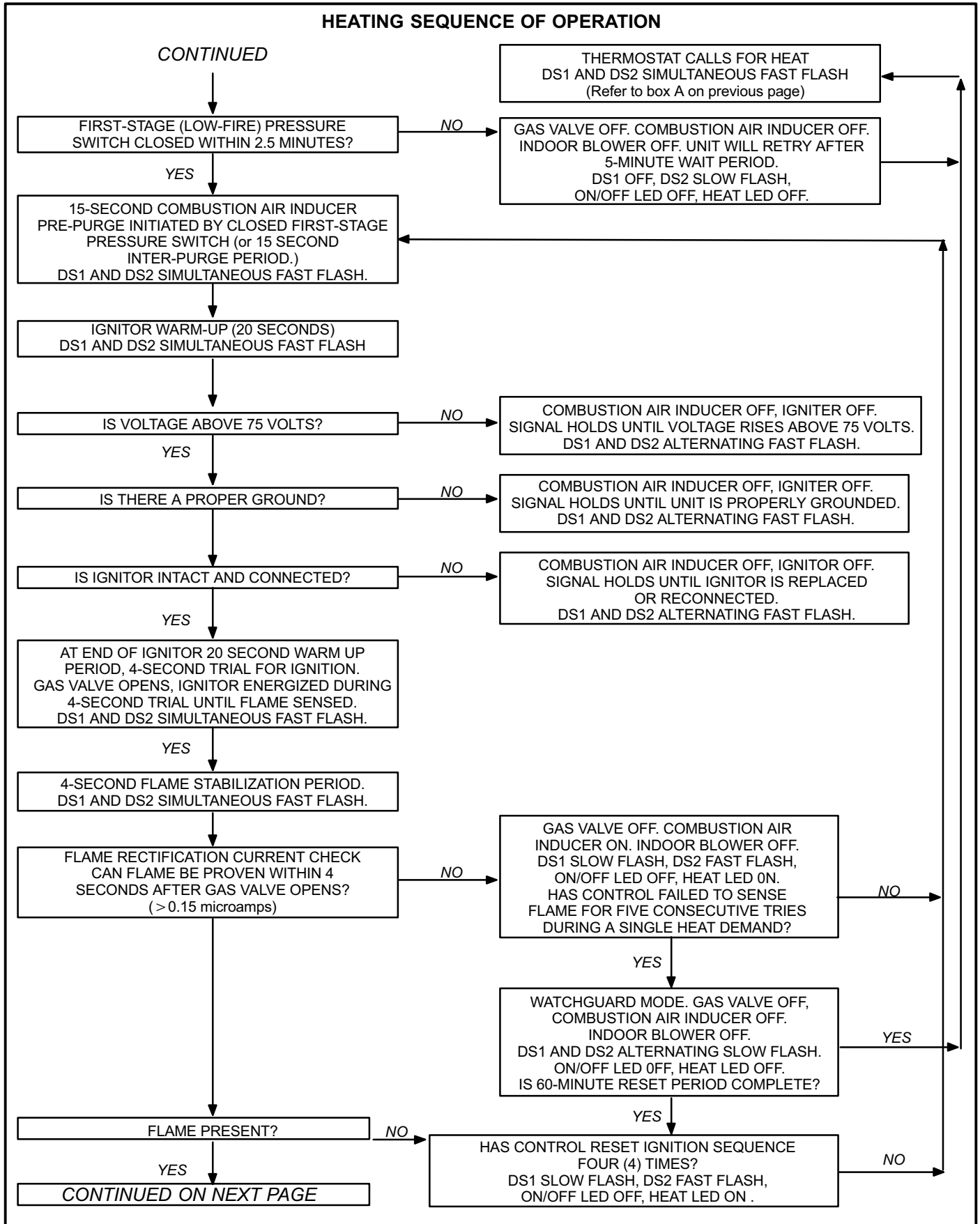
NOTE - Slow flash rate equals 1 Hz (one flash per second). Fast flash rate equals 3 Hz (three flashes per second). Minimum flame sense current = 0.15-0.17 microAmps.

SureLight Troubleshooting: Heating Sequence of Operation

HEATING SEQUENCE OF OPERATION NORMAL AND ABNORMAL HEATING MODE



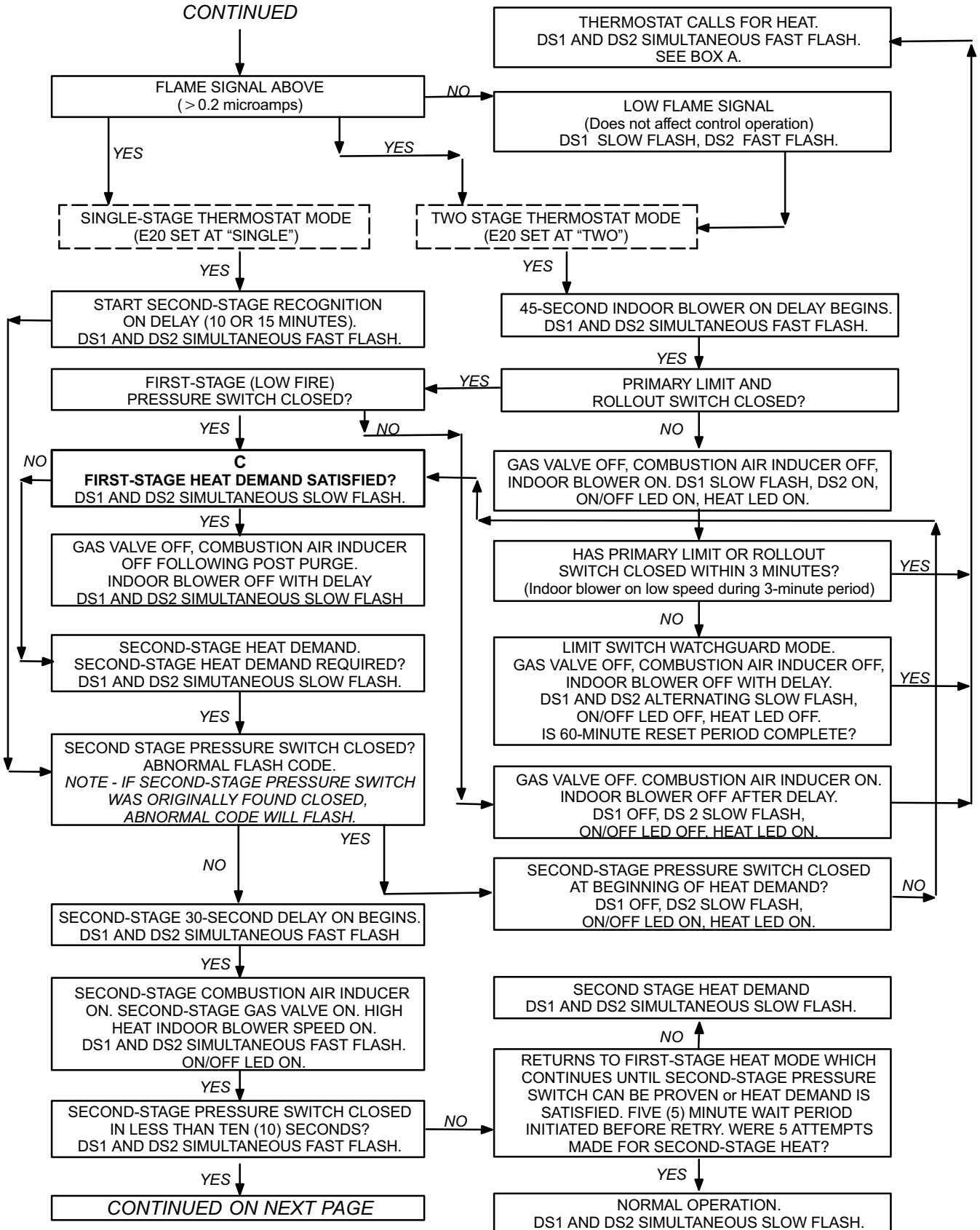
SureLight Troubleshooting: Heating Sequence of Operation (Continued)



SureLight Troubleshooting: Heating Sequence of Operation (Continued)

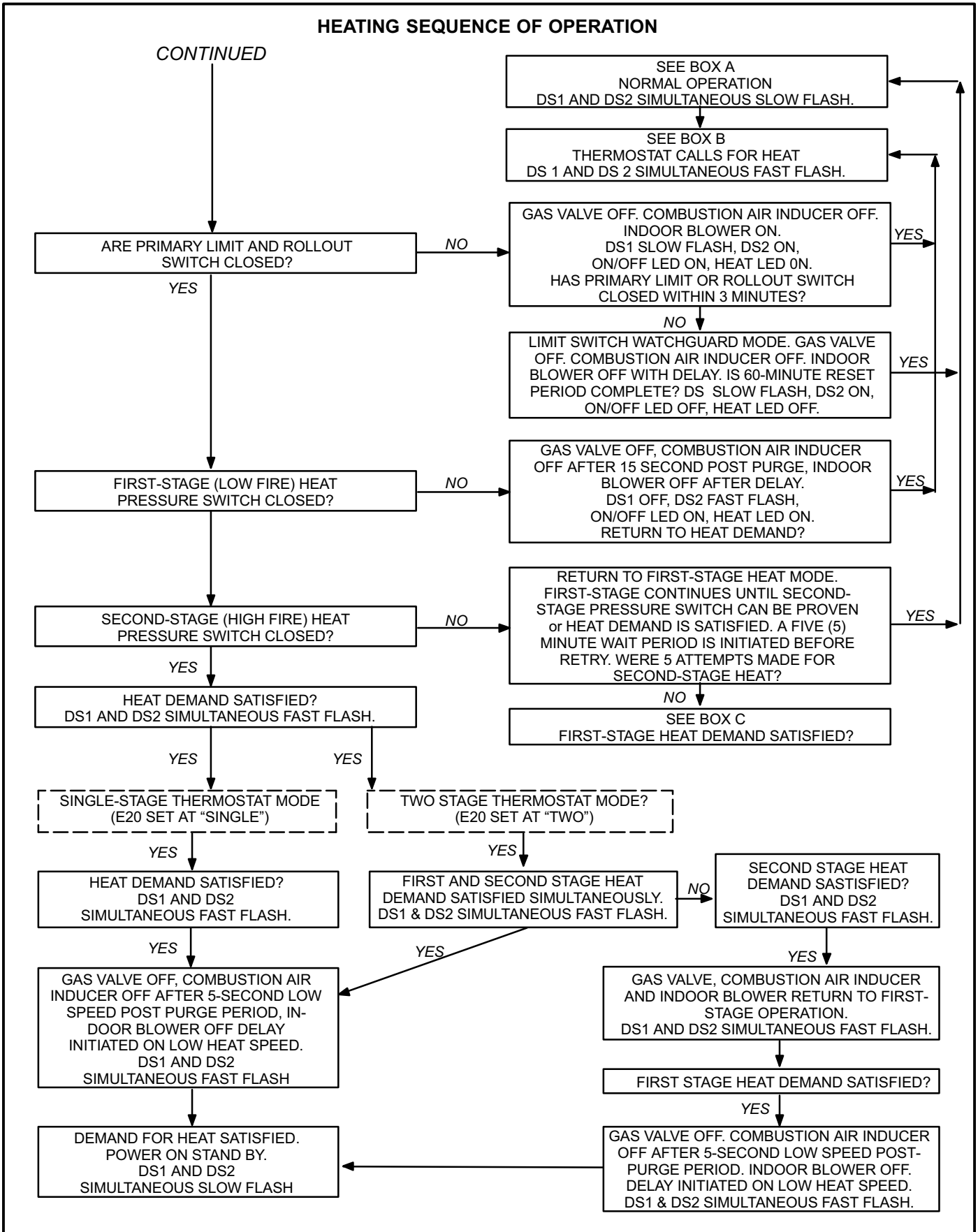
HEATING SEQUENCE OF OPERATION

CONTINUED



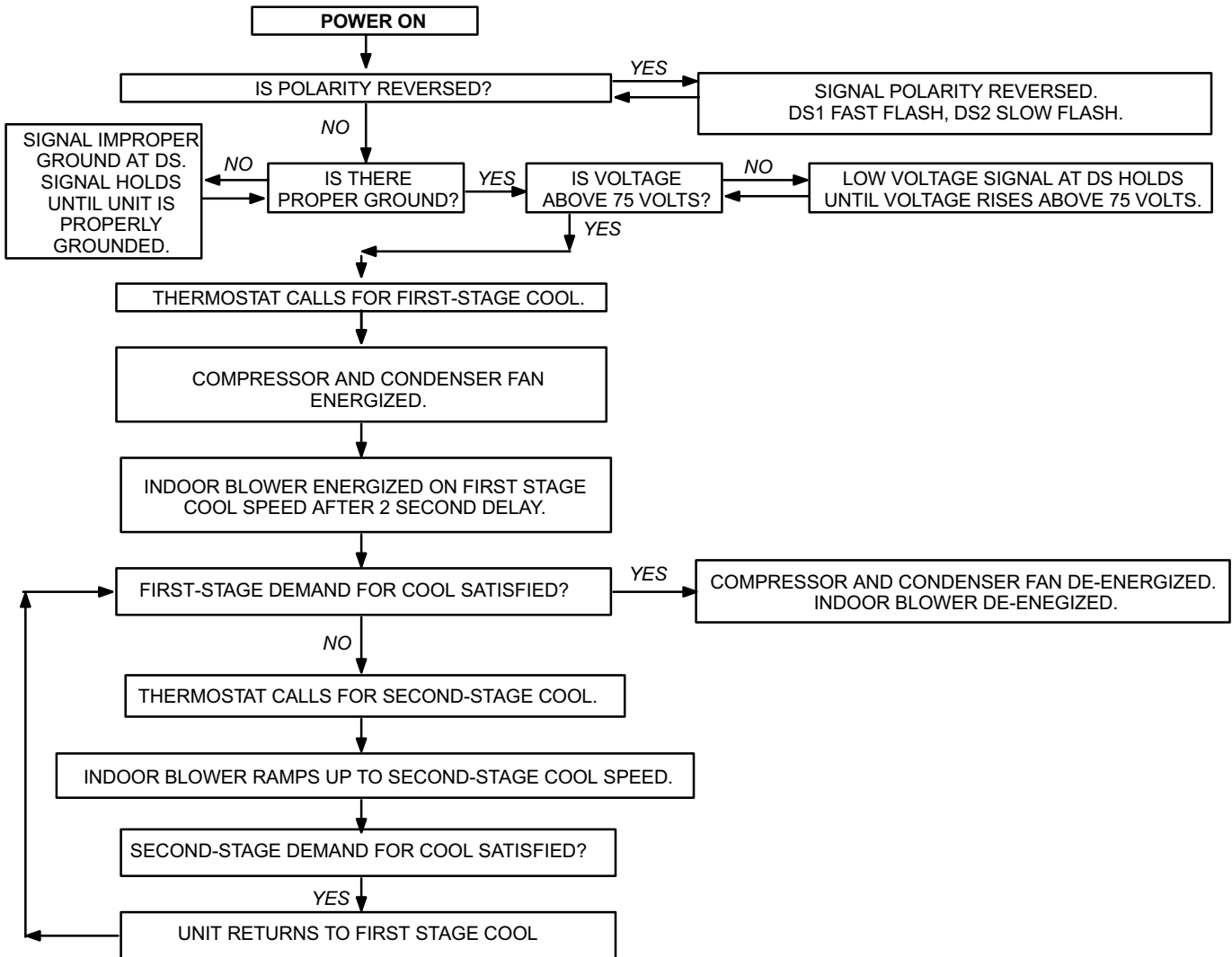
SureLight Troubleshooting: Heating Sequence of Operation (Continued)

HEATING SEQUENCE OF OPERATION

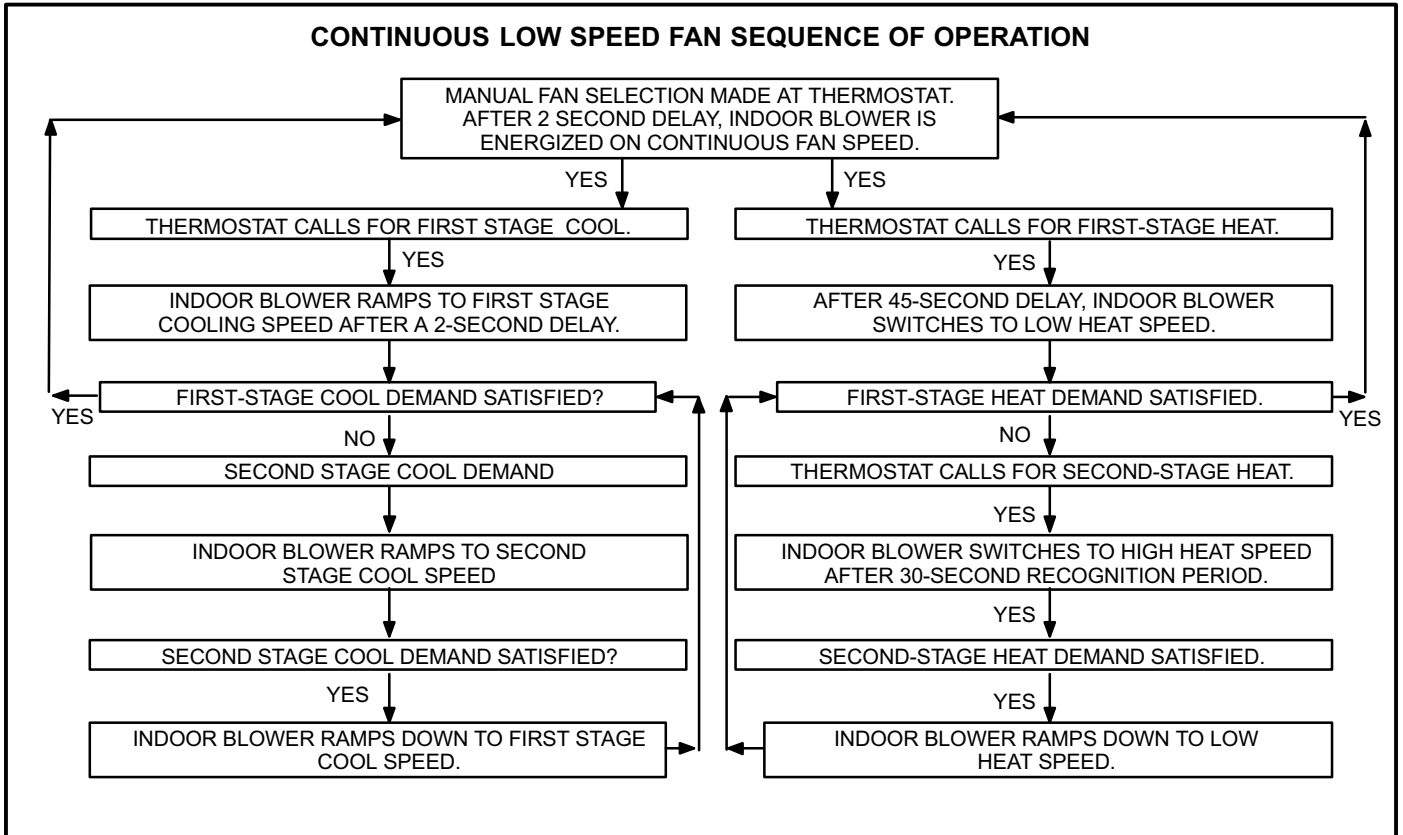


SureLight Troubleshooting: Cooling Sequence of Operation

COOLING SEQUENCE OF OPERATION



SureLight Troubleshooting: Continuous Fan Sequence of Operation



G32V Start-Up & Performance Check List

Job Name _____ Job No. _____ Date _____

Job Location _____ City _____ State _____

Installer _____ City _____ State _____

Unit Model No. _____ Technician _____

Serial No. _____

Heating Section

Electrical Connections Tight?

Line Voltage _____

Blower Motor H.P. _____

Blower Motor Amps _____

Gas Piping Connections
Tight & Leak-Tested?

Fuel Type: Natural Gas?

LP/Propane Gas?

Furnace Btu Input (High fire) _____

Line Pressure _____

Low Fire Manifold Pressure _____ w.c. - Nat.: _____ w.c. - LP/Propane

High Fire Manifold Pressure _____ w.c. - Nat.: _____ w.c. - LP/Propane

Flue Connections Tight?

Proper Draft?

Combustion Gas Tested (high fire and low fire)?

CO₂ CO

Blower ON delay confirmed?
(45 Seconds Fixed On)

External Static Pressure? _____
(0.8 maximum)

Blower OFF Delay Setting (60, 90, 120 or 180)? _____ Temperature Rise _____

Filter Clean & Secure?

Thermostat

Heat Anticipator Setting? _____

Thermostat Level?