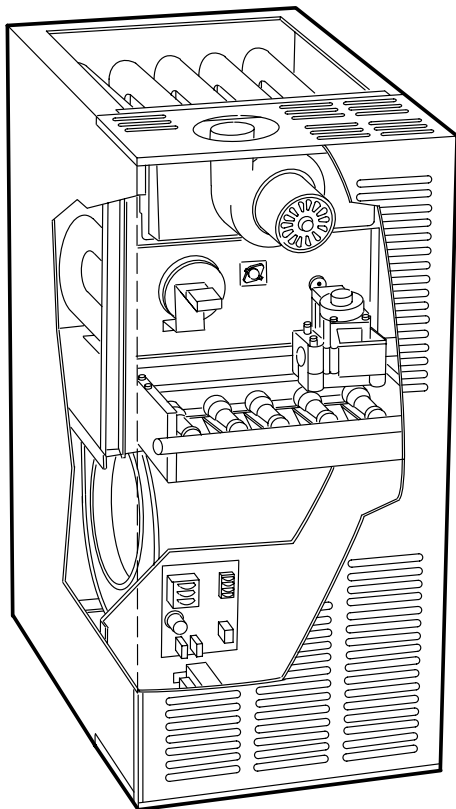




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**RETAIN THESE INSTRUCTIONS  
FOR FUTURE REFERENCE**

# INSTALLATION INSTRUCTIONS

## G24MCE Series

**GAS-FIRED FURNACE**  
Direct Spark Ignition  
503,956M  
05/2000  
Supersedes 11/99



Litho USA

### Table of Contents

G24MCE Unit Dimensions .....	2
G24MCE Gas-Fired Furnace .....	3
Shipping and Packing List .....	3
Requirements .....	3
General .....	3
Combustion, Dilution & Ventilation Air .....	4
Setting Equipment .....	6
Duct System .....	9
Venting .....	9
Vertical Flue Using Metal Flue Pipe .....	9
Vertical Flue Using Lined Masonry Chimney ..	11
Horizontal Flue Using Metal Flue Pipe .....	12
Gas Piping .....	13
Electrical .....	15
Unit Start-up .....	18
Unit Adjustments .....	19
Service .....	20
Technical Data Table .....	22
Ignition Control Board Diagnostic Codes .....	23
Troubleshooting .....	24
Repair Parts List .....	27
G24MCE Parts Arrangement .....	27
G24MCE Start-up & Performance Check List ...	28

	<b>⚠ WARNING</b>
	<b>If the information in this manual is not followed exactly, a fire or explosion may result causing property damage, personal injury or loss of life.</b>

**Do not store or use petrol or other flammable vapours and liquids in the vicinity of this or any other appliance.**

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

### WHAT TO DO IF YOU SMELL GAS:

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

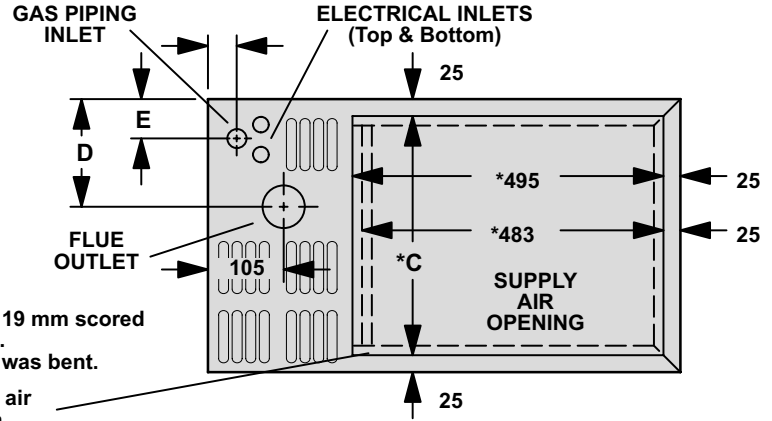
# G24MCE Unit Dimensions - millimeters

## G24MCE Series

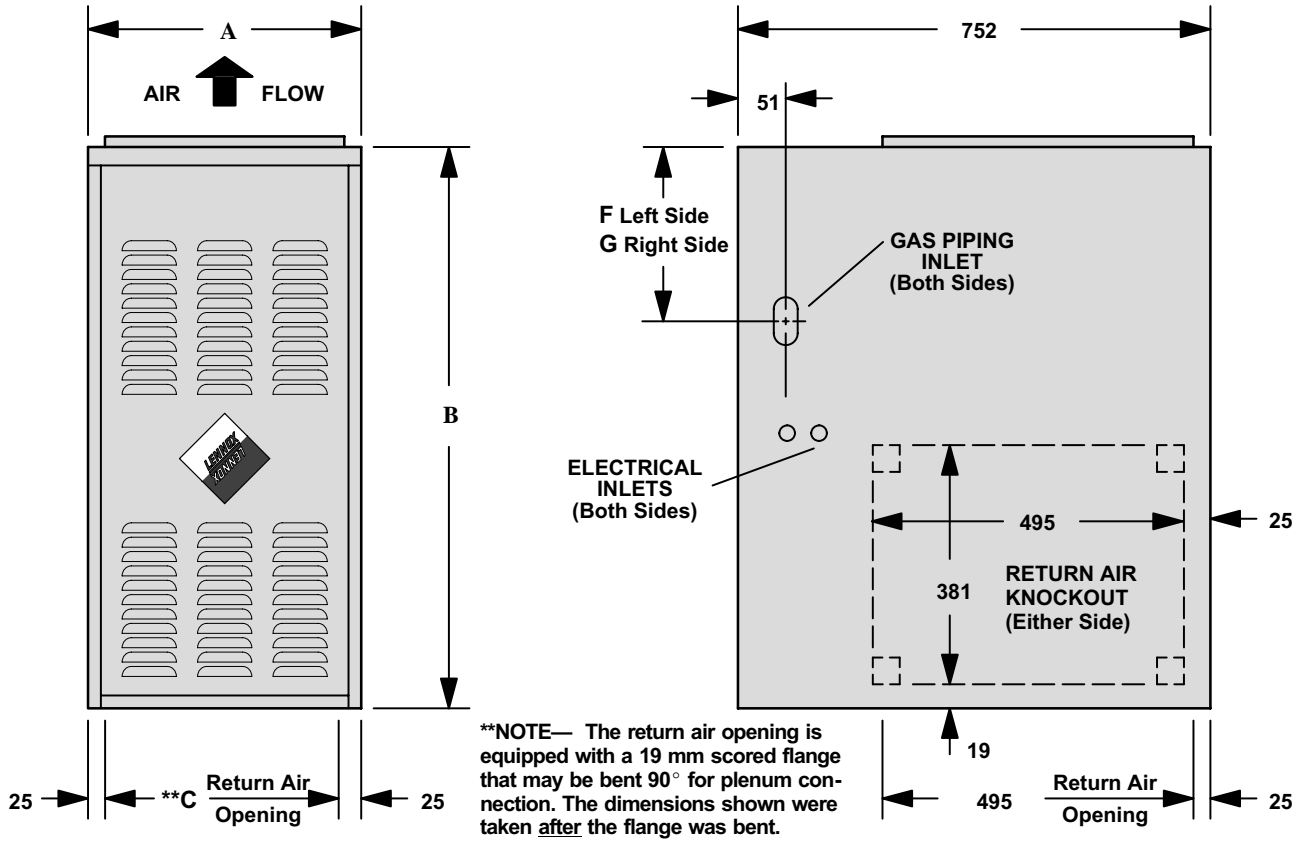
Unit shown in upflow position. Rotate 180° for downflow applications and 90° clockwise or counterclockwise for horizontal applications.

**\*NOTE -** The supply air opening is equipped with a 19 mm scored flange that may be bent 90° for plenum connection. The dimensions shown were taken after the flange was bent.

The double scored flange at the front of the supply air opening may be bent for a total opening dimension (front to rear) of either 495 mm or 483 mm.



TOP VIEW



FRONT VIEW

SIDE VIEW

**\*\*NOTE—** The return air opening is equipped with a 19 mm scored flange that may be bent 90° for plenum connection. The dimensions shown were taken after the flange was bent.

Model No.		A	B	C	D	E	F	G
G24MCE2-45	mm	432	921	381	171	62	293	165
G24MCE3-60/75								
G24MCE4-75								
G24MCE4/5-100	mm	521	991	470	213	108	331	203
G24MCE4/5-120								
G24MCE4/5-140	mm	591	991	540	248	108	329	180

## G24MCE Gas-Fired Furnace

The G24MCE multi-position gas furnace is shipped ready for installation in the upflow position. The unit can easily be converted for installation in either downflow or horizontal applications. The furnace is shipped with a bottom seal panel in place for side return air in upflow applications.

## Shipping and Packing List

### Package 1 of 1 contains:

- 1 - Assembled unit
- 1 - Flue adapter (requires field-installation)
- 1 - Upflow/horizontal filter rack
- 1 - Filter

*The following additional items may be ordered separately, if required:*

- 1 - Additive base (downflow applications)
- 1 - Thermostat
- 1 - Hanging bracket kit
- 1 - External filter rack kit (downflow applications)
- 1 - LP Changeover kit

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

## Requirements

Lennox G24MCE units carry CE marking and are certified for installation in the following countries using the gas categories shown:

I <sub>2</sub> H <sub>3</sub> P :	<b>GB, IE, ES, PT and CH</b>
I <sub>2</sub> H :	<b>DK and IT</b>
I <sub>2</sub> L <sub>3</sub> P :	<b>NL</b>
I <sub>2</sub> E <sub>r</sub> 3P :	<b>FR</b>
I <sub>2</sub> ELL and I <sub>3</sub> P :	<b>DE</b>
*I <sub>2</sub> E+(S) :	<b>BE</b>

\* Units for installation in Belgium are set and sealed for use with G20 reference gas and **must not** be adjusted by installer.

Units must be adjusted or converted in accordance with specific instructions provided by Lennox Industries prior to installation or use in the other countries listed.

These appliances must only be installed, adjusted, converted or serviced by properly qualified personnel. Failure to comply with this requirements may result in a dangerous situation.

The installation must comply with all relevant local and national gas, electrical, building and fire regulations.

Proper ventilation is essential for safe operation and must be provided as detailed in these instructions.

The flue system must be properly designed to comply with any relevant regulations and the requirements set out in these instructions.

Installation clearances must be provided around the appliance and access provided for servicing requirements. See figures 5, 7 and 9.

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

*NOTE-For installation on combustible floors, appliance shall not be installed directly on carpeting, tile, or combustible material such as wood flooring. Protection via a non-combustible material must be provided.*

**The G24MCE unit must not be installed in a residential or commercial garage.**

Unit must be adjusted to obtain a temperature rise within the range specified on appliance rating plate.

G24MCE unit must be installed so that electrical components are protected from water.

When furnace is used in conjunction with cooling units, it shall be installed on the upstream side of cooling units to avoid condensation in the heating compartment.

When installed, furnace must be electrically earthed in accordance with national regulations.

Electrical supply must be properly fused and should be provided with means of isolating the unit from the supply.

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 of the space containing the furnace.

*NOTE — G24MCE series units must not be used as a “construction furnace” at any time during any phase of construction. Very low return air temperatures, harmful vapors and misplacement of the filters will damage the unit and its efficiency.*

The Lennox G24MCE furnace may be installed in alcoves, cupboards, attics, basements, and utility rooms in any of its approved installation positions.

**The G24MCE unit must not be installed in a residential or commercial garage.**

**The air furnace must not be installed in a room containing a bath or shower. In addition, it is recommended that the furnace should not be fitted in a bedroom.**

A compartment used to enclose the air furnace must be designed and constructed specifically for this purpose. An existing cupboard or compartment may be used provided that it is modified for the purpose.

## WARNING

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

## General

These instructions are intended as a general guide and do not supersede local codes in any way. Consult authorities having jurisdiction before installation.

In addition to the requirements outlined previously, the following general recommendations should be considered when installing the Lennox G24MCE furnace.

The furnace should be placed as close to the center of the air distribution system as possible. The furnace should also be located close to the chimney or vent termination point.

Do not install the furnace where draughts might blow directly into it. This could cause improper combustion and unsafe operation.

Do not block furnace combustion air openings with clothing, boxes, doors, etc. Combustion air is needed for proper combustion and safe unit operation.

When the furnace is installed in an attic or other insulated space, keep insulation away from the furnace.

## **⚠ WARNING**

**Product contains glass fibre.**

**Surface tears due to rough handling during shipping or installation should be repaired straight away to avoid respiratory, skin and eye irritation.**

## **Combustion, Dilution & Ventilation Air**

In the past, there was no problem in bringing in sufficient outdoor air for combustion. Infiltration provided all the air that was needed. In today's homes, tight construction practices make it necessary to bring in air from outside for combustion. Take into account that exhaust fans, appliance vents, chimneys, and fireplaces force additional air that could be used for combustion out of the house. Unless outside air is brought into the house for combustion, negative pressure (outside pressure is greater than inside pressure) will build to the point that a downdraft can occur in the furnace vent pipe or chimney. As a result, combustion gases enter the living space creating a potentially dangerous situation.

In the absence of local codes concerning air for combustion and ventilation, this section outlines guidelines and recommends procedures for installing G24MCE Furnaces in a manner that ensures efficient and safe operation. Special consideration must be given to combustion air needs as well as requirements for exhaust vents and gas piping.

## **⚠ CAUTION**

**Do not install furnace in a corrosive or contaminated atmosphere. Meet all combustion and ventilation air requirements, as well as all local codes.**

## **⚠ CAUTION**

**Insufficient combustion air can cause headaches, nausea, dizziness or asphyxiation.**

## **Combustion Air Requirements**

All gas-fired appliances require air for the combustion process. If sufficient combustion air is not available, the furnace or other appliance will operate inefficiently and unsafely. Enough air must be provided to meet the needs of all fuel-burning appliances and appliances such as exhaust fans which force air out of the house. When fireplaces, exhaust fans, or clothes dryers are used at the same time as the furnace, much more air is required to ensure proper combustion and to prevent a downdraft. Insufficient air causes incomplete combustion which can result in carbon monoxide.

In addition to providing combustion air, fresh outdoor air dilutes contaminants in the indoor air. These contaminants may include bleaches, adhesives, detergents, solvents and other contaminants which can corrode furnace components.

The requirements for providing air for combustion and ventilation depend largely on whether the furnace is installed in an unconfined or a confined space.

### **Unconfined Space**

An unconfined space is an area such as a basement or large equipment room with a volume greater than 4.85m<sup>3</sup> per 1 kW (50 ft<sup>3</sup> per 1000 Btuh) of the combined input rating of all appliances installed in that space. This space also includes adjacent rooms which are not separated by a door. Though an area may appear to be unconfined, it might be necessary to bring in outdoor air for combustion if the structure does not provide enough air by infiltration. If the furnace is located in a building of tight construction with weather stripping and sealing around the windows and doors, follow the procedures in the air from outside section.

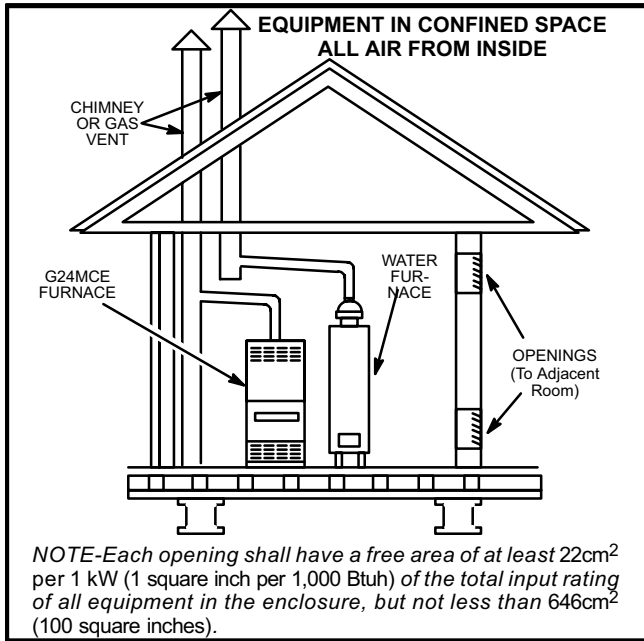
### **Confined Space**

A confined space is an area with volume less than 4.85m<sup>3</sup> per 1 kW (50 ft<sup>3</sup> per 1000 Btuh) of the combined input rating of all appliances installed in that space. This definition includes furnace cupboards or small equipment rooms.

When the furnace is installed so that supply ducts carry air circulated by the furnace to areas outside the space containing the furnace, the return air must be handled by ducts which are sealed to the furnace casing and which terminate outside the space containing the furnace. This is especially important when the furnace is mounted on a platform in a confined space such as a cupboard or small equipment room. Even a small leak around the base of the unit at the platform or at the return air duct connection can cause a potentially dangerous negative pressure condition. Air for combustion and ventilation can be brought into the confined space either from inside the building or from outside.

**Air from Inside**

If the confined space that houses the furnace adjoins a space categorized as unconfined, air can be brought in by providing two permanent openings between the two spaces. Each opening must have a minimum free area of 22cm<sup>2</sup> per 1 kW (1 square inch per 1000 Btuh) of total input rating of all gas-fired equipment in the confined space. Each opening must be at least 646cm<sup>2</sup> (100 square inches). One opening shall be within 305mm (12 inches) of the top of the enclosure and one opening within 305mm (12 inches) of the bottom. See figure 1.

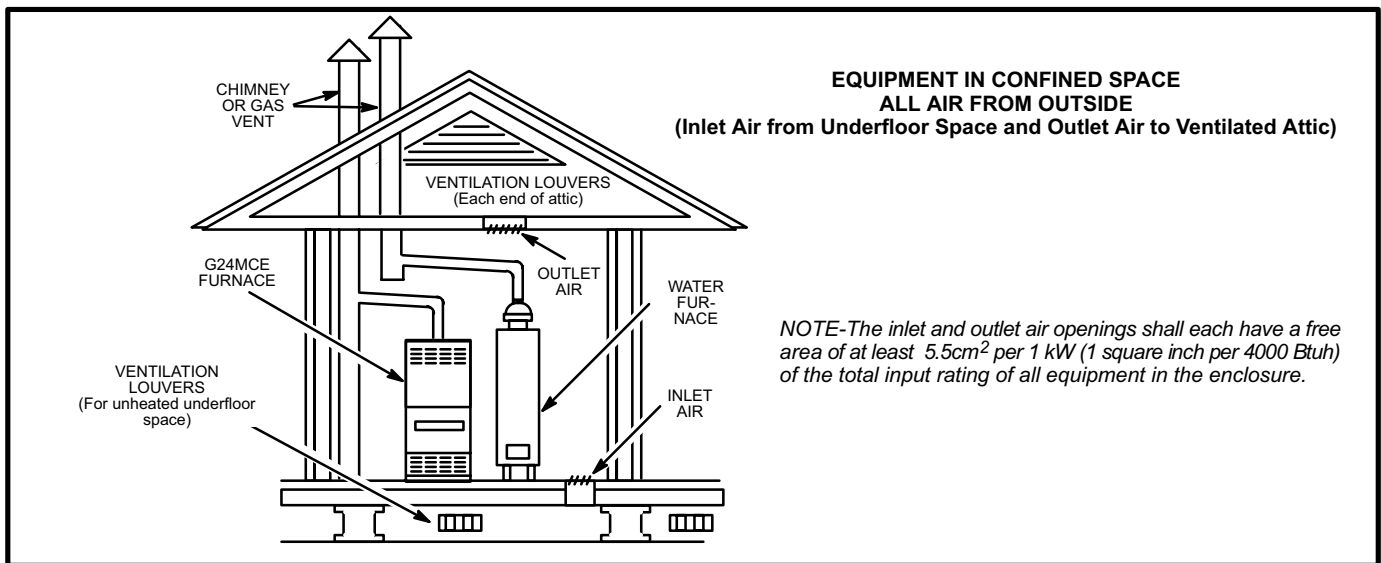


**FIGURE 1**

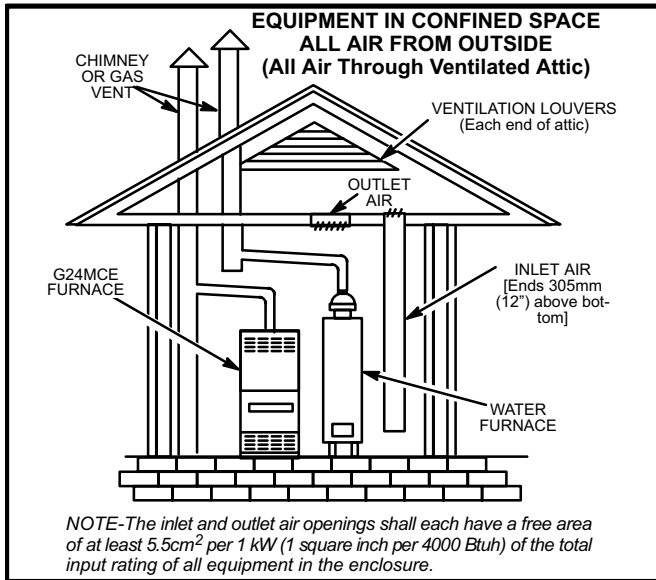
**Air from Outside**

If air from outside is brought in for combustion and ventilation, the confined space must have two permanent openings. One opening shall be within 305mm (12 inches) of the top of the enclosure and one within 305mm (12 inches) of the bottom. These openings must communicate directly or by ducts with the outdoors or spaces (underfloor or attic) that freely communicate with the outdoors or indirectly through vertical ducts. Each opening shall have a minimum free area of 5.5cm<sup>2</sup> per 1 kW (1 square inch per 4000 Btuh) of total input rating of all equipment in the enclosure. See figures 2 and 3. When communicating with the outdoors through horizontal ducts, each opening shall have a minimum free area of 3cm<sup>2</sup> per 1 kW (1 square inch per 2000 Btuh) of total input rating of all equipment in the enclosure. See figure 4.

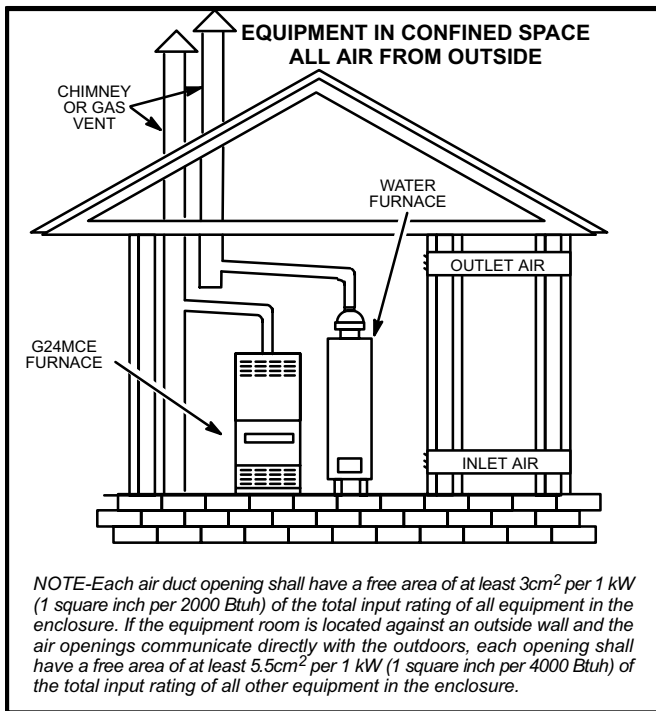
When ducts are used, they shall be of the same cross-sectional area as the free area of the openings to which they connect. The minimum dimension of rectangular air ducts shall be no less than 75mm (3 inches). In calculating free area, the blocking effect of louvers, grilles, or screens must be considered. If the design and free area of protective covering is not known for calculating the size opening required, it may be assumed that wood louvers will have 20 to 25 percent free area and metal louvers and grilles will have 60 to 75 percent free area. Louvers and grilles must be fixed in the open position or interlocked with the equipment so that they are opened automatically during equipment operation.



**FIGURE 2**



**FIGURE 3**



**FIGURE 4**

### Setting Equipment

The Lennox G24MCE multi-position gas furnace can be installed as shipped in upflow position or in horizontal position with right-hand or left-hand discharge. The furnace can easily be converted for downflow applications. Select unit location that will allow for required clearances listed on the unit rating plate. Also consider gas supply connections, electrical supply, vent connection and installation and service clearances [610mm (24 in.)] at unit front.

*NOTE - 1/3 and 1/2 hp fan motors are equipped with either four flexible mounting legs or three flexible legs and one rigid leg. The rigid leg is equipped with a shipping bolt and a flat white plastic washer (rather than the rubber mounting grommet used with a flexible mounting leg). This shipping bolt and flat washer must be removed before the furnace is put into operation. Once the shipping bolt and washer are removed, the rigid leg will not touch the fan housing.*

### UPFLOW APPLICATIONS

The Lennox G24MCE furnace is shipped in a standard upflow position. Level the furnace using shims or leveling bolts. Knockouts are provided in unit base to install field-provided leveling bolts. Allow for clearances to combustible materials as indicated on the unit rating plate. Minimum clearances for cupboard or alcove installations are shown in figure 5.

In upflow applications, return air can be brought in through the bottom or either side of the furnace. If a furnace with bottom return air is installed on a platform, make an airtight seal between the bottom of the furnace and the platform to ensure proper and safe operation.

Knockouts are provided on both sides of the furnace cabinet for installations with side return air. When side return air is used, seal the bottom of the furnace using the panel provided.

An upflow filter rack is provided. The adjustable rack can be installed beneath the furnace (flush with cabinet edges) for bottom return air applications or on the side of the furnace for side return air.

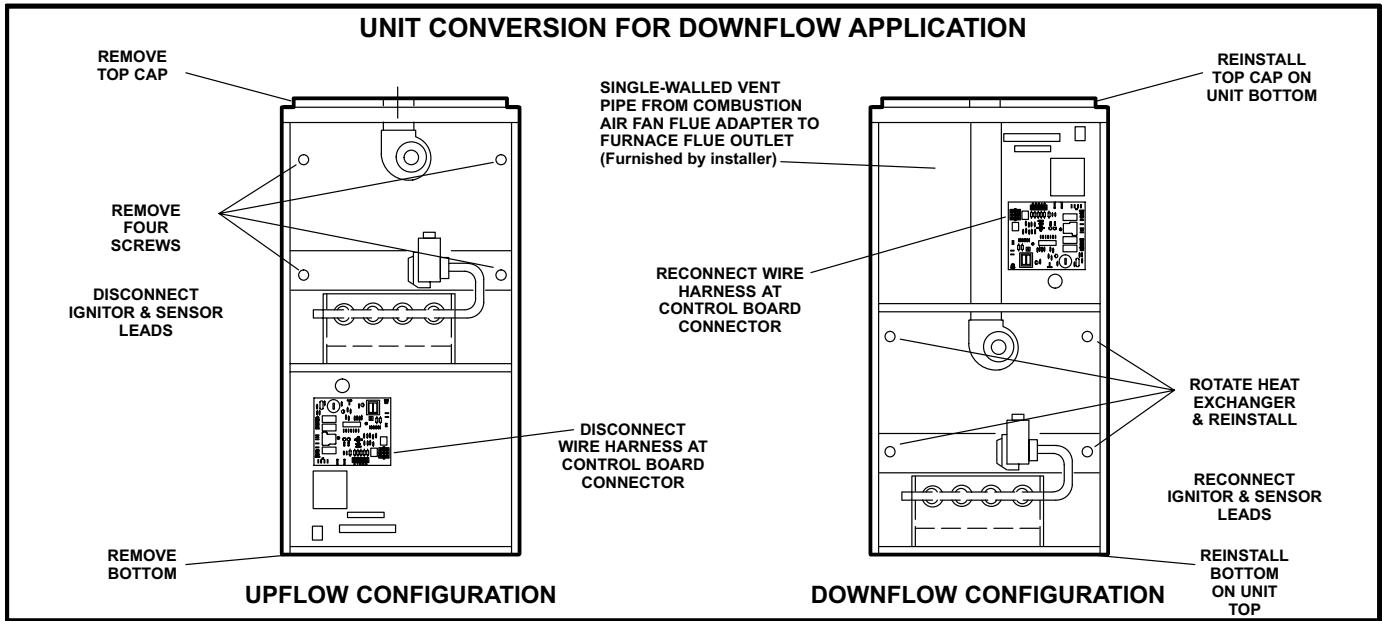
*NOTE - A sheet metal filter puller is provided along with filter kit. In bottom return air applications, filter puller must be installed between frame and filter to hold filter in place.*

**UPFLOW APPLICATION  
INSTALLATION CLEARANCES**

VENT CONNECTOR TYPE	SINGLE WALL	TWIN WALL
TOP	25mm (1 in.)	25mm (1 in.)
*FRONT	51mm (2 in.)	51mm (2 in.)
BACK	25mm (1 in.)	25mm (1 in.)
SIDES	25mm (1 in.)	25mm (1 in.)
FLUE	152mm (6 in.)	25mm (1 in.)
BOTTOM	**NC	**NC

\*Front clearance in alcove installation must be a minimum of 610mm (24 in.) for service access.  
\*\*On combustible floor with non-combustible protection. NC - Non-Combustible

**FIGURE 5**



**FIGURE 6**

**DOWNFLOW APPLICATIONS**

The Lennox G24MCE furnace is shipped in the upflow configuration and must be converted for downflow installation. Refer to figure 6 and the following steps to convert the unit for downflow installation:

- 1 - Place unit on its back and remove access panel.
- 2 - Disconnect wire harness in control area.
- 3 - Disconnect ignition lead and sensor wire located in burner box. Use pliers to remove strain relief plugs from holes on side of burner box.
- 4 - Remove four no. 10 screws securing cabinet bottom to unit and remove bottom.
- 5 - Remove four no. 10 screws securing cabinet top cap to cabinet. Remove top cap and replace with bottom.
- 6 - Remove four screws holding heat exchanger assembly in place. Slide heat exchanger out through top of cabinet.
- 7 - Rotate heat exchanger 180° and slide back into cabinet through top. Resecure using four screws.
- 8 - Install cabinet bottom using four no. 10 screws.
- 9 - Position strain relief grommets on ignition and flame sensor wires. Insert wires and grommets through holes on side of burner box. Reconnect wires to ignitor and flame sensor.
- 10- Reconnect wire harness plug.
- 11- Replace unit access panel.

In downflow applications, the unit can be installed in three different ways: on non-combustible flooring, on combustible floor using an additive base, or on a reverse-flow cooling cabinet. Do not drag unit across floor.

Allow clearances to combustible materials as outlined on unit rating plate. Minimum clearances for cupboard or alcove installations are outlined in figure 7.

A separate downflow filter kit is available for use in downflow applications. Filter rack provided with unit is for use in horizontal or upflow applications only.

**DOWNFLOW APPLICATION  
INSTALLATION CLEARANCES**

VENT CONNECTOR TYPE	SINGLE WALL	TWIN WALL
TOP	25mm (1 in.)	25mm (1 in.)
*FRONT	51mm (2 in.)	51mm (2 in.)
BACK	25mm (1 in.)	25mm (1 in.)
SIDES	25mm (1 in.)	25mm (1 in.)
FLUE	152mm (6 in.)	25mm (1 in.)
BOTTOM	NC**	NC**

NC - Non-combustible floor  
 \*Front clearance in alcove installation must be a min. of 610mm (24 in.) for service access.  
 \*\*With additive base on combustible floor.

**FIGURE 7**

**A-Installation on Non-Combustible Flooring**

- 1 - Cut floor opening keeping in mind the clearances listed on the unit rating plate. Also, keep in mind gas supply and electrical supply, vent connections and sufficient installation and service clearances. See table 1 for correct floor opening size.

**TABLE 1  
NONCOMBUSTIBLE FLOOR OPENING**

UNIT	Front to Rear		Side to Side	
	mm	in	mm	in
G24MCE-45/60/75	502	19-3/4	388	15-1/4
G24MCE-100/120	502	19-3/4	477	18-3/4
G24MCE-140	502	19-3/4	546	21-1/2

*NOTE-Floor opening dimensions listed are 6mm (1/4") larger than unit openings.*

- 2 - Flange warm air plenum and lower into opening.
- 3 - Set unit over plenum.
- 4 - Check to see that an adequate seal is made.

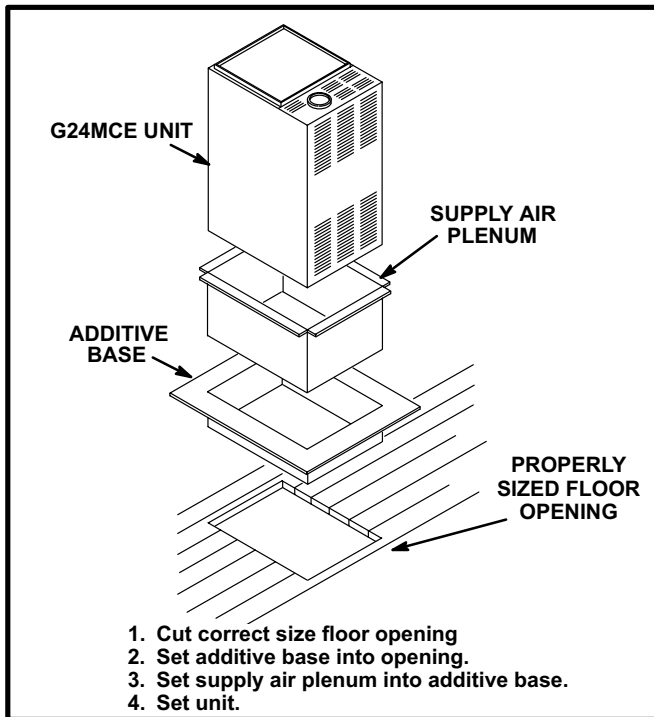
**B-Installation on Combustible Flooring**

- 1 - When unit is installed on a combustible floor, an additive base (ordered separately) must be installed between the furnace and the floor. See table 2 for opening size to cut in the floor.

**TABLE 2  
ADDITIVE BASE FLOOR OPENING**

UNIT	Front to Rear		Side to Side	
	in	mm	in	mm
G24MCE-45/60/75	21-7/8	556	17-5/16	440
G24MCE-100/120	21-7/8	556	20-3/4	528
G24MCE-140	21-7/8	556	23-1/2	597

*NOTE-Floor opening dimensions listed are 1/4" (6mm) larger than additive base openings.*



**FIGURE 8**

- 2 - After opening is cut, set the additive base into opening.

- 3 - Check glass fibre strips on additive base to make sure they are properly glued and positioned.
- 4 - Lower supply air plenum into additive base until plenum flanges seal against glass fibre strips.
- 5 - Set unit on additive base so unit flanges drop into plenum. Refer to figure 8.

*NOTE-Be careful not to damage glass fibre strips. Check for tight seal.*

**C-Installation on Cooling Cabinet**

- 1 - Refer to reverse flow coil installation instructions for correctly sized opening in floor and installation of cabinet.
- 2 - When cooling cabinet is in place, install furnace so flanges drop inside cabinet opening.
- 3 - Seal cabinet and check for air leakage.

**HORIZONTAL APPLICATIONS**

The Lennox G24MCE furnace can be installed in horizontal applications in either upflow or downflow configuration (See figure 6). It is preferable to install the unit in the standard upflow configuration, if possible, because the vent pipe will not interfere with service access for fan. **The unit cannot be installed on its back.**

Filter rack is provided. Adjustable rack can be installed flush with cabinet edges.

Allow for clearances to combustible materials as indicated on the unit rating plate. Minimum clearances for cupboard or alcove installations are shown in figure 9.

**HORIZONTAL APPLICATION  
INSTALLATION CLEARANCES**

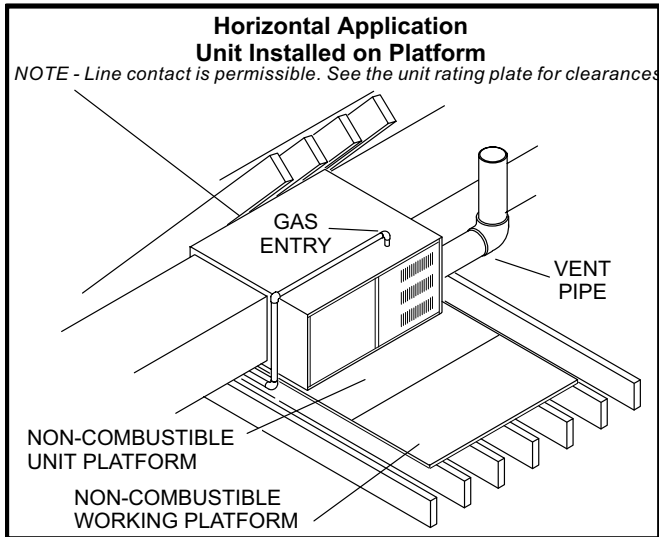
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BACK	25mm (1 in.)	25mm (1 in.)
SIDES	51mm (2 in.)	51mm (2 in.)
FLUE	152mm (6 in.)	25mm (1 in.)
BOTTOM	**NC	**NC

\*Front clearance in alcove installation must be a minimum of 610mm (24 in.) for service access.  
\*\*On combustible floor with non-combustible protection.  
NC - Non-Combustibles

**FIGURE 9**



Furnaces may be installed in either an attic or a crawlspace. See figure 10 for furnace installations on a platform.  
**NOTE** - When the furnace is installed on a platform in a crawlspace, it must be elevated enough to avoid water damage and to allow the air conditioning coil to drain.

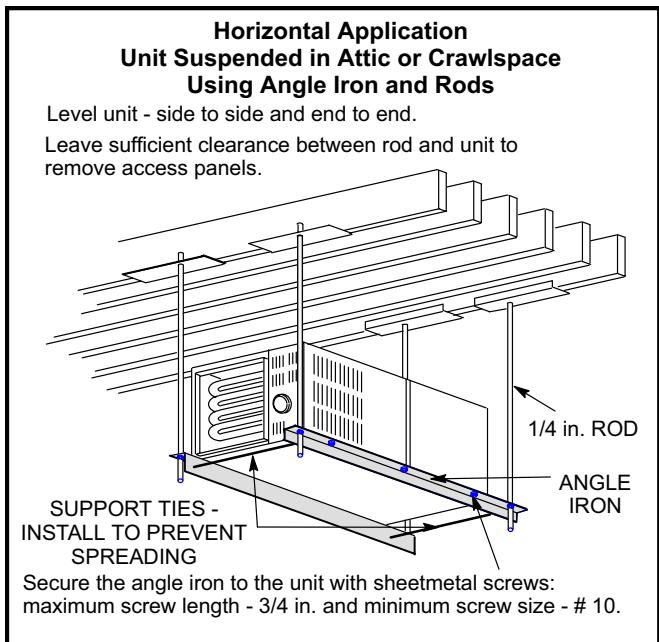


**FIGURE 10**

Anyone of the following methods may be used to suspend the furnace from roof rafters or floor joists:

- 1 - Using Lennox hanging bracket kit catalog number 46J66 -  
 Install as indicated in the installation instructions provided with the hanging bracket kit.
- 2 - Using angle iron with at least 1/4 in. diameter rods -  
 Install as shown in figure 11.

*Note - Rods must not interfere with plenum or exhaust piping; **cooling coils and supply and return air plenums must be supported separately.***



**FIGURE 11**

## **⚠ WARNING**

**Improper installation of unit can result in personal injury or death. Flue gases must never be allowed to enter the return air system or the living space. Sheet metal screws and sealing tape should be used to seal ducting to the furnace. In platform installations, return air must always be ducted to the unit. A unit must never be installed so that it draws return air from the furnace chamber, attic or underfloor space. The furnace platform must be level with no sagging, cracks or gaps. Furnaces must always be isolated from other heating appliances to prevent fire, explosion, and carbon monoxide poisoning. Personal injury and/or property damage could result..**

### **Duct System**

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

#### **SUPPLY AIR PLENUM**

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

#### **RETURN AIR PLENUM**

**Return air must not be drawn from a room where this furnace, or any other gas appliance (ie., a water heater), is installed.** 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 throughout the house by the furnace duct system.

In upflow applications, return air can be brought in through the bottom or either side of the furnace. If a furnace with bottom return air is installed on a platform, make an airtight seal between the bottom of the furnace and the platform to ensure proper and safe operation. Use fiberglass sealing strips between the plenum and the furnace cabinet to ensure a tight seal. If a filter is installed, size the return air duct to fit the filter frame.

In downflow applications, use the following steps when installing return air plenum:

- 1 - Flange bottom edge of plenum with a hemmed edge. See figure 12.
- 2 - In all cases, secure the plenum to the top flanges of the furnace using sheet metal screws. See figure 12.

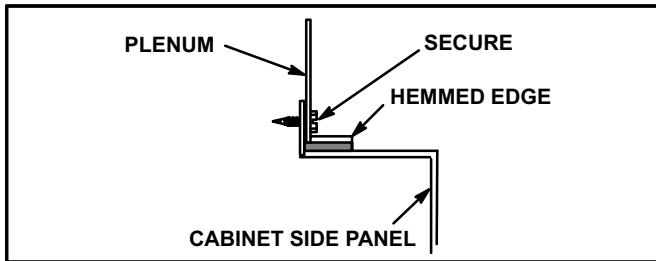


FIGURE 12

- 3 - In cupboard installations, it may be necessary to install sheet metal screws from the inside. If this is the case, make plenum with a removable front to install screws as shown in figure 13.

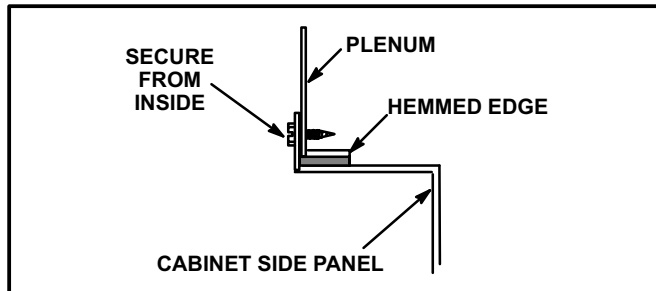


FIGURE 13

## Venting

**The G24MCE unit is not certified for common venting.**

A flue adapter is supplied with the furnace. It must be field-installed between the induced draught fan flue outlet and the flue connector using one or two corrosion-resistant sheet metal screws. **Modification of or failure to install the adapter will cause unsafe unit operation and will void unit certification.** The flue adapter does not require insulation.

### VERTICAL FLUE USING METAL FLUE PIPE

The flue system should be of the same nominal diameter as the adapter supplied with the unit and should be fitted inside the adapter either directly or using a connector designed for the flue system used. Where it is not possible to use the same nominal diameter, a larger size may be used with an appropriate conversion piece to suit the unit adapter. A flue system of smaller nominal diameter than the unit adapter must not be used.

*NOTE - Use these instructions as a guide. They do not supersede local codes.*

Size and install the G24MCE vertical flue per local codes and regulations and these instructions.

See figure 14 for typical application of a vertical flue using twin wall metal flue pipe.

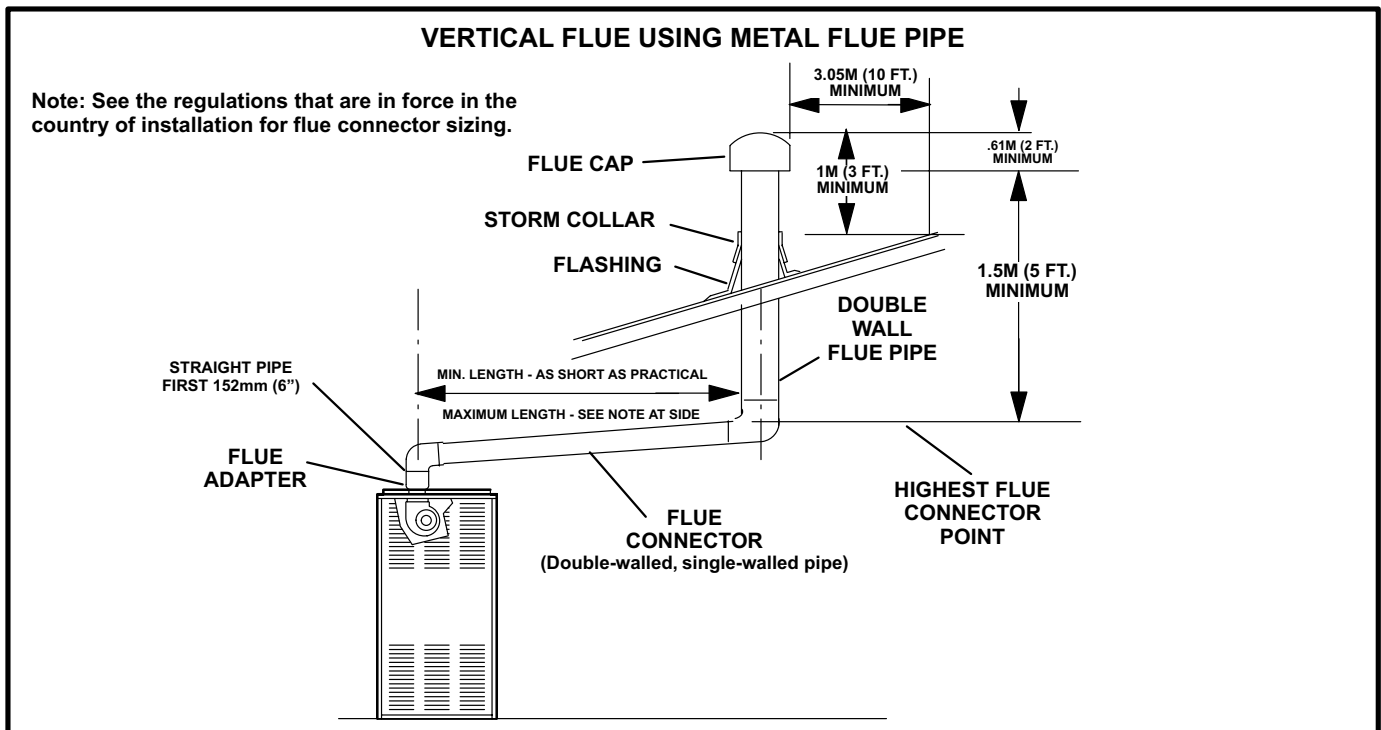


FIGURE 14

## Recommendations and Requirements

When sizing and installing a vertical flue using metal flue connectors and either metal flue pipe or a lined masonry chimney, the following recommendations and requirements should be considered in addition to those outlined above:

- 1 - Accessories attached to the flue to reduce heat loss and improve efficiency have not been tested for use with this furnace.
- 2 - When the G24MCE furnace is replacing an existing furnace, inspect the existing flue system for obstructions, corrosion and proper sizing.
- 3 - Make runs of single-walled or twin-walled metal pipe used as flue connector easily accessible, so that it can be inspected annually and cleaned and replaced if necessary.
- 4 - **See the regulations that are in force in the country of installation for flue connector sizing.**
- 5 - When the vent connector must be located in or pass through a crawl space or other areas which may be cold, that portion of the vent connector shall be a listed twin-wall flue pipe or a pipe of a material having equivalent insulation qualities.
- 6 - Secure all joints with at least two corrosion-resistant screws. Check all accessible joints for gas tightness after installation.

### **WARNING**

**Failure to properly seal flue system could allow carbon monoxide leakage resulting in injury or death.**

- 7 - Make flue connector horizontal runs as short as possible with a minimum number of elbows. One 90° elbow is equivalent to 1.5m (5 ft.) of straight pipe. One 45° elbow is equivalent to .75m (2.5 ft.) of straight pipe.
- 8 - Horizontal runs of flue connector must rise at least 20mm per meter (1/4 in. per ft.) away from the furnace.
- 9 - Horizontal run length must not represent more than 75 percent of the vertical rise of the flue system.

- 10 - Support horizontal runs of flue connector with straps or hangers, so that there are no dips or sags.
- 11 - Support the flue connector at 1m (3 ft.) intervals and at all elbows.
- 12 - If single wall flue is used, fasten the flue adapter to the flue outlet of the furnace and the flue connector to the flue adapter using one or two corrosion-resistant sheet metal screws. If twin walled flue pipe is used, fasten according to manufacturer's instructions
- 13 - Install first flue connector elbow a minimum of 6 in. (152mm) from furnace flue outlet.
- 14 - Terminal location must not be within 600 mm (2 ft.) of an openable window, air vent, or other ventilation opening. Flue terminal must be located in accordance with any national regulations applicable. A flue guard must be fitted if required by the regulations.
- 15 - Fit a split flue socket immediately above the furnace to facilitate servicing and maintenance.
- 16 - Flue pipes and fittings should be constructed of aluminium or stainless steel.

## VERTICAL FLUE USING MASONRY CHIMNEY

The following additional requirements apply when a lined masonry chimney is used to vent a G24MCE furnace:

See figure 15 for exterior chimney application.

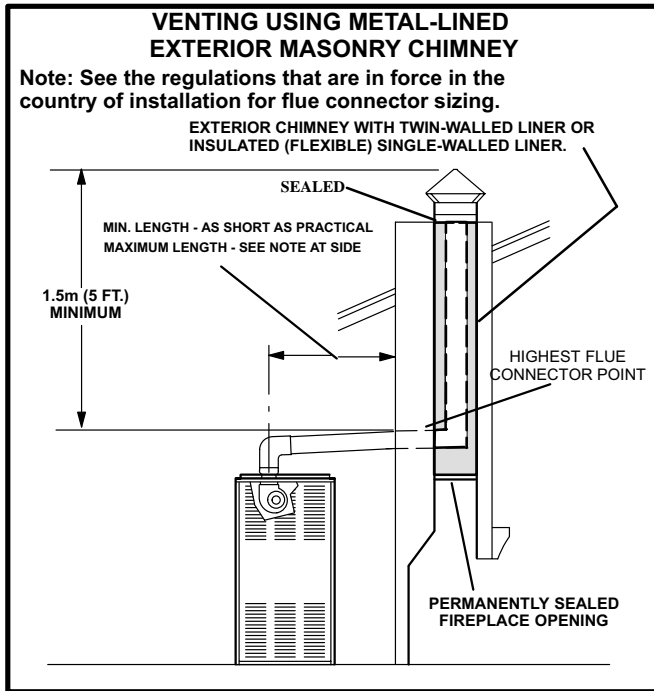
Masonry chimneys that once served fireplaces cannot be used for venting purposes unless the fireplace opening is permanently sealed.

Tile-lined chimneys must be composed of a non-porous, acid-resistant material. The internal diameter of the chimney liner must not be less than the diameter of the furnace flue adapter.

The G24MCE gas furnace must **not** be connected to a chimney that is servicing a separate appliance which burns solid fuel.

### **IMPORTANT**

**SINGLE appliance venting of a fan-assisted furnace into a tile-lined masonry chimney (interior or outside wall) is PROHIBITED. The chimney must first be lined with either twin-walled flue or an insulated single wall flexible vent lining system, sized in accordance with the the regulations in force in the country of installation.**



**FIGURE 15**

Do not install a manual damper, barometric draught regulator, or flue restrictor between the furnace and the chimney. Remove any such existing devices.

If twin-wall flue is used inside a chimney, no other appliance can be vented into the chimney. Outer wall of twin-wall flue pipe must not be exposed to flue products.

If a flexible single-walled liner is used in a masonry chimney, the liner must be insulated. Insulation for the flexible vent pipe must be an encapsulated fiberglass sleeve recommended by the flexible vent pipe manufacturer. See figure 15.

If twin-wall flue or an insulated flexible vent pipe cannot be used as liners, the chimney must be rebuilt to accommodate one of these methods or some alternate approved method must be found to vent the appliance.

The space between the liner and the chimney wall should **NOT** be insulated with puffed mica or any other loose granular insulating material.

When inspection reveals that an existing chimney is not safe for the intended purpose, it shall be rebuilt to conform to nationally recognized standards. The chimney passageway must be checked periodically to ensure that it is clear and free of obstructions.

**HORIZONTAL FLUE USING METAL FLUE PIPE**

These instructions should be used as a guide and do not supersede local codes in any way. Size and install the G24MCE horizontal flue according to the national and local codes and regulations which are in effect in the country of installation.

The following are specific requirements for installation of the G24MCE furnace:

- 1 - Install first flue connector elbow a minimum of 152mm (6 in.) from the furnace flue outlet.
- 2 - If the flue is sloped upward as it is routed away from the furnace, the furnace must be protected from the condensate produced in the flue.
- 3 - The flue system must be sealed (all joints must be sealed), as positive pressure can occur in the flue.
- 4 - A 152mm (6 in.) clearance must be maintained to all combustibles when single-walled flue pipe is used. A 25mm (1 in.) clearance to all combustibles must be maintained when twin-walled flue pipe is used.
- 5 - If single-walled flue is used, fasten the flue adapter to the flue outlet of the furnace and the flue connector to the flue adapter using one or two corrosion-resistant sheet metal screws. If twin-walled flue pipe is used, fasten to the adapter according to manufacturer's instructions.
- 6 - Support flue as required by the regulations in force.
- 7 - See table 3 for flue diameter, equivalent lengths and termination allowed.
- 8 - The tee termination shown in figures 16 and 17 is the only acceptable termination.

**TABLE 3  
HORIZONTAL FLUE PIPE SIZING**

MODEL SIZE	UNIT ORIENTATION	MINIMUM FLUE PIPE DIAMETER mm (in.)	MINIMUM FLUE EQUIVALENT LENGTH* m (ft.)	MAXIMUM FLUE EQUIVALENT LENGTH* m (ft.)	TERMINATION TEE
45	HORIZONTAL UPFLOW / DOWNFLOW	102 (4)	3 (10)	9.2 (30)	1
60/75/100/120/140	HORIZONTAL	102 (4)	3 (10)	9.2 (30)	1
	UPFLOW / DOWNFLOW	102 (4)	3 (10)	13.7 (45)	

\*One 90° elbow equals 1.5 m (5 ft.) of straight pipe. One 45° elbow equals 0.75 m (2.5 ft.) of straight pipe.

9 - The flue termination must be located in accordance with any national regulations applicable. The terminal must be designed such that it will not allow entry of a 16mm (.6 in.) ball when applied with a 5N force. A terminal guard must be applied where required by national regulations.

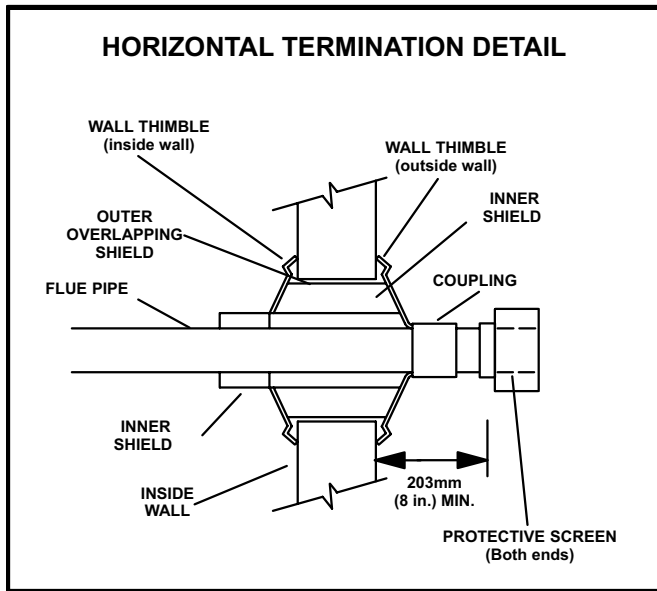


FIGURE 16

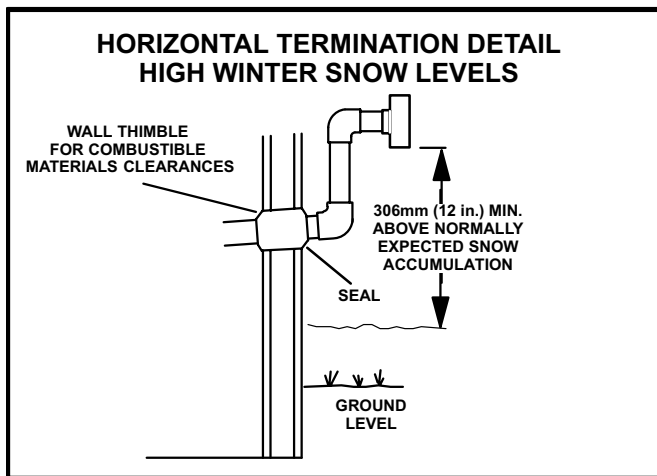


FIGURE 17

## Gas Piping

### GAS SUPPLY

1 - Service pipes - The gas supply authorities should be consulted at the installation planning stage in order to establish the availability of an adequate supply of gas.

2 - Meters - A gas meter is connected to the service pipe by the gas supply authorities. An existing meter should be checked by the gas supply authorities to ensure that the meter is adequate to deal with the rate of gas supply required.

3 - Pipework from the meter to the air furnace must be of adequate size. Do not use pipes of a smaller size than the inlet gas connection on the furnace. The complete installation must be tested for soundness as described in the codes in force.

4 - This unit is shipped standard for left or right side installation of gas piping (or top entry in horizontal applications). Connect the gas supply to the piping assembly.

5 - When connecting gas supply, factors such as length of run, number of fittings and furnace rating must be considered to avoid excessive pressure drop. Table 4 and 5 list recommended pipe sizes for typical applications.

6 - The gas piping must not run in or through air ducts, clothes chutes, chimneys or gas vents, dumb waiters or elevator shafts.

7 - In some localities, it may be necessary to take precautions against condensation in gas pipes. Where condensation in pipes is considered likely to occur, or if such precautions are required by national regulations, the following steps should be taken to prevent condensation from entering the unit.

The piping should be sloped 1/4 inch per 15 feet upward toward the meter from the furnace. The piping must be supported at proper intervals (every 8 to 10 feet) using suitable hangers or straps. A drip leg should be installed in vertical pipe runs to the unit.

8 - A manual main shut-off valve and union (furnished by installer) should be installed external to the unit. Union must be of the ground joint type. See figure 18.

## ▲ IMPORTANT

**Compounds used on threaded joints of gas piping must be resistant to the actions of liquified petroleum gases.**

*NOTE - Install an 1/8" RC plugged tap in the field piping upstream of the gas supply connection to the unit. Tap must be accessible for test gauge connection. See figure 18.*

*NOTE - In case emergency shutoff is required, shut off main manual gas valve and disconnect electrical power to unit. These devices should be properly labeled by the installer.*

TABLE 4 - GAS PIPE CAPACITY (FT <sup>3</sup> /HR)											
Nominal Iron Pipe Size inches	Internal Diameter inches	Length of Pipe - feet									
		10	20	30	40	50	60	70	80	90	100
1/4	.364	43	29	24	20	18	16	15	14	13	12
3/8	.493	95	65	52	45	40	36	33	31	29	27
1/2	.622	175	120	97	82	73	66	61	57	53	50
3/4	.824	360	250	200	170	151	138	125	118	110	103
1	1.049	680	465	375	320	285	260	240	220	205	195
1-1/4	1.380	1,400	950	770	660	580	530	490	460	430	400
1-1/2	1.610	2,100	1,460	1,180	990	900	810	750	690	650	620
2	2.067	3,950	2,750	2,200	1,900	1,680	1,520	1,400	1,300	1,220	1,150
2-1/2	2.469	6,300	4,350	3,520	3,000	2,650	2,400	2,250	2,050	1,950	1,850
3	3.068	11,000	7,700	6,250	5,300	4,750	4,300	3,900	3,700	3,450	3,250
4	4.026	23,000	15,800	12,800	10,900	9,700	8,800	8,100	7,500	7,200	6,700

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

TABLE 5 - GAS PIPE CAPACITY (M <sup>3</sup> /HR)											
Nominal Iron Pipe Size inches	Internal Diameter inches	Length of Pipe - metres									
		3	6	9	12	15	18	21	24	27	30
1/2	.622	4.29	3.40	2.74	2.32	2.06	1.87	1.72	1.61	1.50	1.41
3/4	.824	10.20	7.08	5.66	4.81	4.27	3.91	3.54	3.34	3.11	2.91
1	1.049	19.27	13.17	10.62	9.06	8.07	7.36	6.80	6.23	5.80	5.52
1-1/4	1.380	39.67	26.92	21.82	18.70	16.43	15.02	13.88	13.03	12.18	11.33
1-1/2	1.610	59.51	41.37	33.43	28.05	25.50	22.95	21.25	19.55	18.42	17.56
2	2.067	111.93	79.93	62.34	53.84	47.60	43.07	39.67	36.84	34.57	32.58
2-1/2	2.469	178.53	123.27	99.75	85.01	75.09	68.01	63.76	58.09	55.26	52.62
3	3.068	311.72	218.20	171.11	150.19	134.60	121.85	110.52	104.85	97.76	92.10
4	4.026	651.78	447.74	308.89	274.88	249.37	229.54	212.53	204.03	189.86	

NOTE-Capacity given in cubic metres of gas per hour and based on 0.60 specific gravity gas.

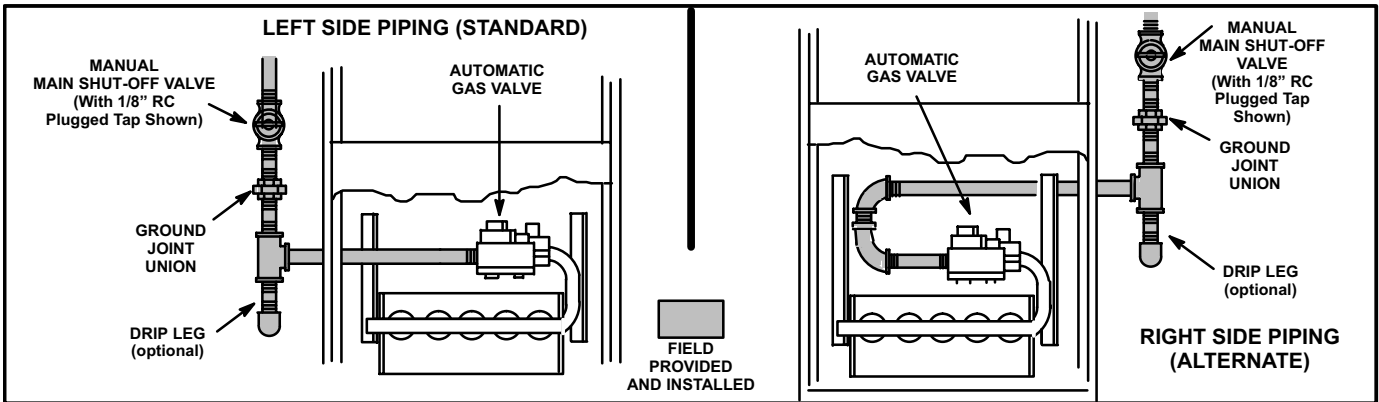


FIGURE 18

**SOUNDNESS 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.

NOTE - In case emergency shutdown is required, shut down main manual gas valve and disconnect electrical power to unit. These devices should be properly labeled by the installer.

**CAUTION**

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

The furnace must be isolated from the gas supply system by closing its individual manual shut-off valve during any pressure testing of the gas supply system at pressures equal to or less than 20 in. w.c. (50 mBAR).

## ⚠️ IMPORTANT

At pressures greater than 20 in. w.c. (50 mBAR), gas valve must be disconnected and isolated. See figure 19. Gas valves can be damaged if subjected to more than 20 in. w.c. (50 mBAR).

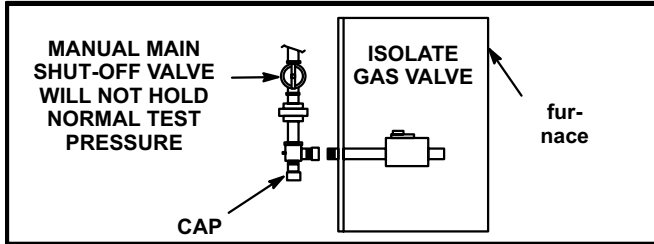


FIGURE 19

## Electrical

## ⚠️ 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.

These units operate on 240 volt, single phase, 50 hertz electrical power. Refer to figure 20 for field wiring and figure 22 for schematic wiring diagram and troubleshooting.

- 1 - Select circuit protection and wire size according to requirements listed on unit rating plate.
- 2 - Knockouts are provided on both sides of the furnace cabinet to facilitate wiring.
- 3 - Install room thermostat according to instructions provided with thermostat.
- 4 - Install a separate disconnect switch (protected by either fuse or circuit breaker) near the unit so power can be turned off for servicing.
- 5 - Before connecting thermostat or power wiring, check to make sure wires will be long enough to facilitate servicing at a later date. Remove blower access panel and swing panel to check wire length for access.
- 6 - Complete wiring connections to equipment using wiring diagrams provided with unit and in field wiring diagrams shown in figures 20. Use 18 gauge wire or larger for thermostat connections.
- 7 - Electrically earth unit according to national regulations.

8 - Three 240 volt accessory terminals are provided on the control board. Two are energized with the indoor blower and one is energized with the combustion air blower. Any accessory rated up to one amp can be connected to the accessory terminals with the neutral leg of the circuit being connected to the 240 volt neutral wires.

9 - This unit is equipped with an integrated control board that controls blower operation, fan off timings and ignition. The board includes a terminal strip for thermostat connections and two diagnostic LEDs. See figure 21 for control board configuration. Diagnostic codes are given in a chart at the back of this manual.

The red diagnostic button can be used to view the last failure code.

10- Refer to blower speed chart on wiring diagrams for factory-set cooling, heating and continuous fan speeds.

Systems using a cooling thermostat subbase may operate the blower continuously (factory set at low speed) through the thermostat "FAN ON" switch. Systems which do not include a cooling subbase require a toggle switch which must be wired between terminals "R" and "G" on the thermostat connection terminal strip.

The blower motor will operate at the designated speed during cooling or heating demand; however, when demand is satisfied, blower speed will revert to selected continuous speed.

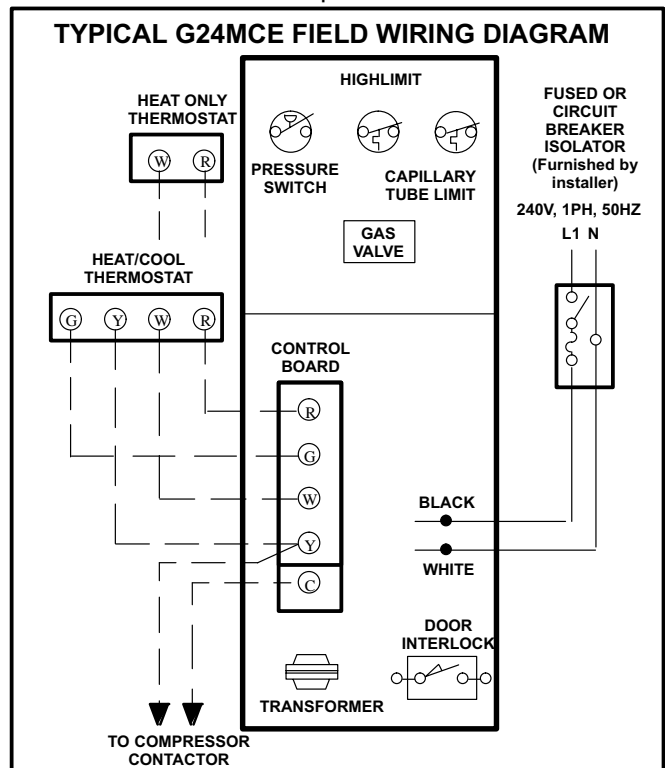


FIGURE 20

# EGC-3ACE INTEGRATED CONTROL BOARD

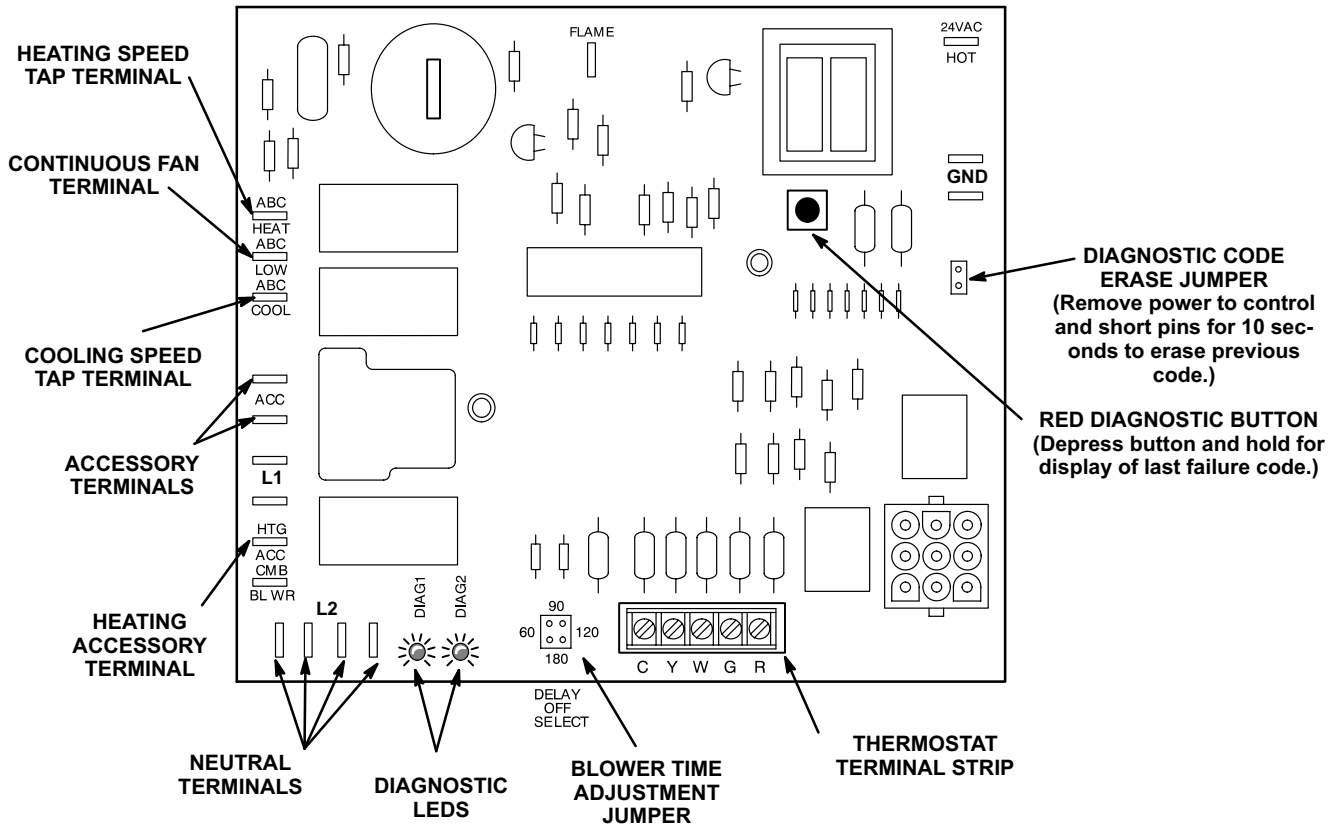


FIGURE 21



## G24MCE SCHEMATIC WIRING DIAGRAM (240V, 1PH, 50HZ)

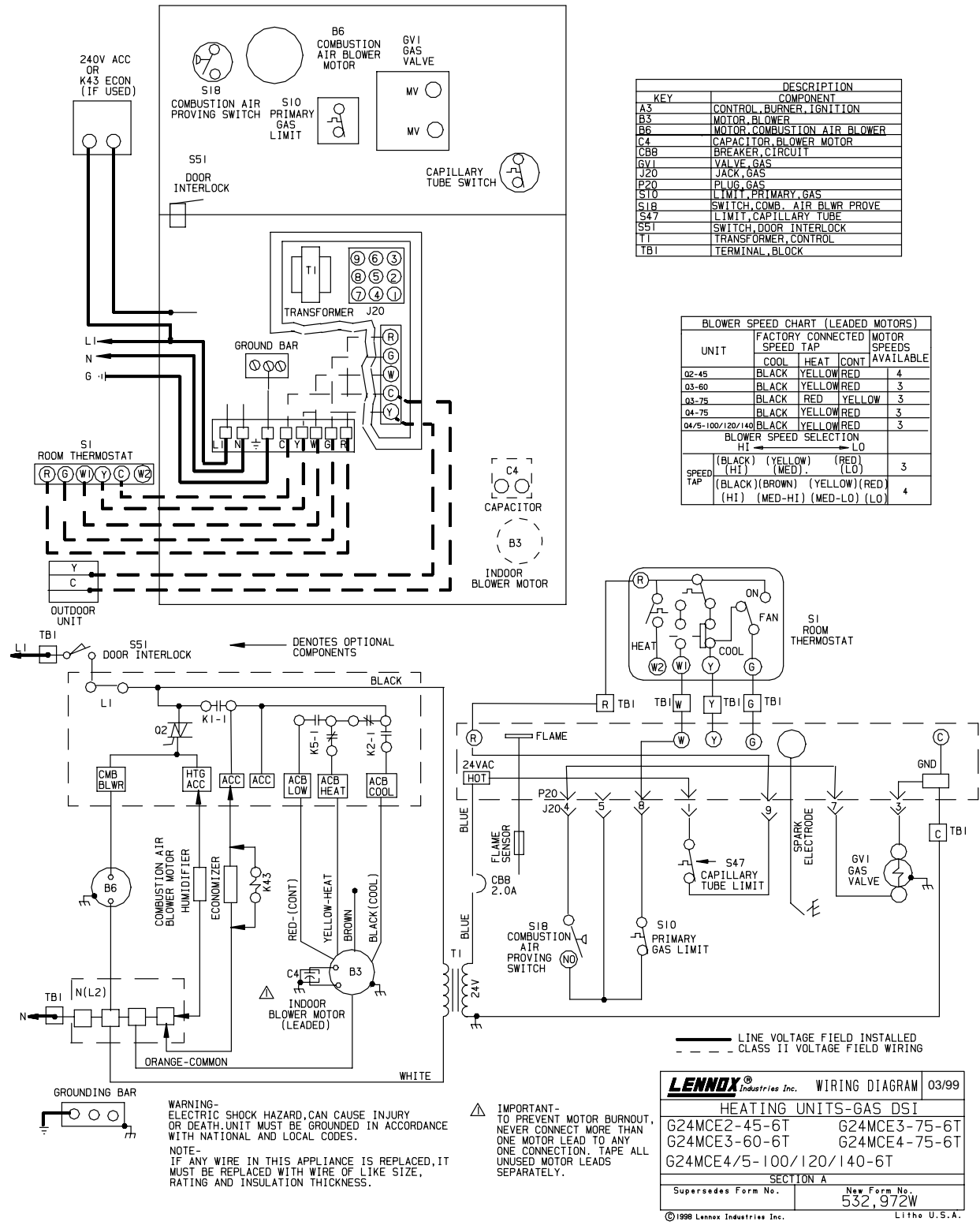


FIGURE 22

## Unit Start-Up

FOR YOUR SAFETY READ BEFORE OPERATING

### ⚠ WARNING

Do not use this furnace if any part has been under-water. Immediately call a qualified service technician to inspect the furnace and to replace any part of the control system and any gas control which has been under water.

### ⚠ WARNING

If overheating occurs or if gas supply fails to shut off, shut off the manual gas valve to the appliance before shutting off electrical supply.

### ⚠ CAUTION

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

Use only your hand to turn the main manual gas cock. Never use tools. If the knob will not turn by hand, do not try to repair it, call a qualified service technician. Force or attempted repair may result in a fire or explosion.

#### PLACING FURNACE INTO OPERATION

G24MCE units are equipped with an automatic direct spark ignition system. Do not attempt to manually light burners on these Furnaces. Each time the thermostat calls for heat, the burners will automatically light.

### ⚠ WARNING

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

#### GAS VALVE OPERATION (Figure 23)

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

- 5 - 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.

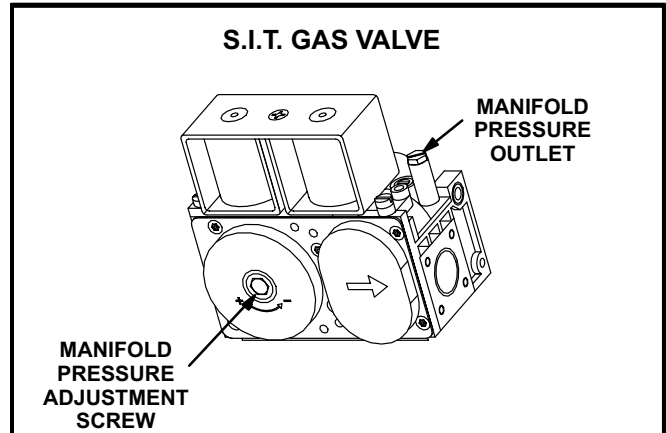


FIGURE 23

- 6- Turn on all electrical power to the unit.
- 7- Set the thermostat to desired setting.
- 8- If the appliance will not operate, follow the instructions "Turning Off Gas To Unit" and call your service technician or gas supplier.

*NOTE-When unit is initially started, steps 1 through 7 may need to be repeated to purge air from gas line.*

#### TURNING OFF GAS TO UNIT

- 1 - Set the thermostat to lowest setting.
- 2 - Turn off all electrical power to the unit if service is to be performed.

#### Heating Sequence of Operation

- 1 - When thermostat calls for heat, combustion air blower starts after a 5 second delay.
- 2 - Combustion air pressure switch proves blower operation, then allows power to ignition control. Switch is factory set and requires no adjustment.
- 3 - After 15-second prepurge, spark ignitor energizes and gas valve solenoid valves open.
- 4 - Spark ignites gas, ignition sensor proves the flame and combustion process continues.
- 5 - If flame is not detected after first ignition trial, ignition control will repeat steps 3 and 4 four more times before locking out. To re-establish ignition attempts after lockout, proceed as follows:
  - a - Turn **OFF** the power to the furnace.
  - b - Move the thermostat control from the "HEAT" to the "OFF" position.
  - c - Turn **ON** the power to the furnace.
  - d - Move the thermostat control from the "OFF" to "HEAT" position.

## Unit Adjustments

### HIGH LIMIT AND CAPILLARY TUBE LIMIT

The high limit and manually-reset capillary tube limit are both located on the heating compartment vestibule panel. Both limits are factory set and do not require field adjustment.

When there is inadequate supply air (a high supply air temperature), the high limit shuts off the gas supply to the burners, turns the combustion air blower **OFF**, and keeps the air circulating blower **ON** until the limit resets itself. While the limit is open, the control board displays **DIAG.1 - FLASHING; DIAG.2 - ON**. If the limit trips 5 times in succession, a "60 minute Watchguard" occurs. After 60 minutes, the control board automatically resets itself. (The control board can also be reset by switching the thermostat from **HEAT** to **OFF** and then back to **HEAT** again.)

When there is inadequate supply air (a high supply air temperature), the manually-reset capillary tube limit shuts off the gas supply to the burners and turns both the combustion air blower and the air circulating blower **OFF**. (The air circulating blower turns off only after its preset delay-off time expires). While the limit is open, the control board then displays **DIAG.1 - ON; DIAG.2 - FLASHING**. To reset the limit, allow the furnace to cool, and then push the switch on the limit's face inward.

If either limit trips, check for clogged filters or blocked supply/return air grilles.

### COMBUSTION AIR PRESSURE SWITCH

The combustion air pressure switch is located on the heating compartment vestibule panel. This switch checks for proper combustion air fan operation before allowing ignition trial. The switch is factory-set and requires no field adjustment.

### FAN CONTROL

The fan control is part of the control board located on the heating compartment vestibule panel. The preset fan on delay time of 45 seconds is not adjustable. The fan off delay time is factory adjusted at 120 seconds and can be adjusted by moving the jumper on the integrated control board. See figure 24 for settings.

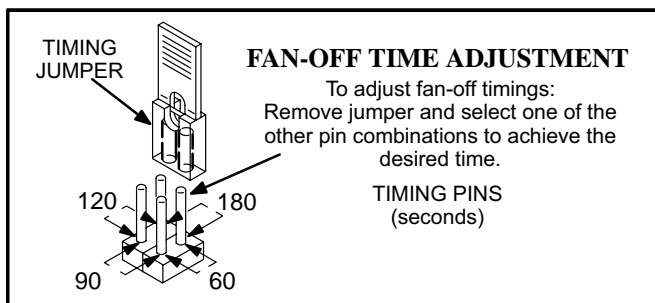


FIGURE 24

### GAS FLOW

To check for proper gas flow to combustion chamber, determine heat (kW) input from the unit rating plate. Divide this input rating (MJ/hr) by the calorific value per unit volume (MJ/m<sup>3</sup>) of the gas being used. Result is the volume of gas required per hour. Determine the flow of gas through gas meter for two minutes and multiply by 30 to get the hourly flow of gas.

### GAS PRESSURE

- 1 - Check the gas line pressure with unit firing at maximum rate. See technical data table on page 22 for minimum and maximum allowable pressure.
- 2 - After line pressure has been checked and adjusted, check manifold pressure. Manifold pressures are given in technical data table on page 22. See figure 23 for gas pressure adjustment screw location.

### TEMPERATURE RISE

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

If outdoor air is added to the recirculating room air, the mixed air temperature at the heat exchanger should not be lower than 15.5°C for extended periods of time.

### THERMOSTAT HEAT ANTICIPATION

Set thermostat heat anticipation to:

0.80 amps                      S.I.T. gas valve

### ELECTRICAL

- 1 - Check all wiring for loose connections.
- 2 - Check for correct voltage at the furnace (furnace operating).
- 3 - Check amp-draw on fan motor.  
Motor Nameplate \_\_\_\_\_ Actual \_\_\_\_\_

### FAN SPEEDS

*Note - CFM readings are taken external to unit with a dry evaporator coil and without accessories.*

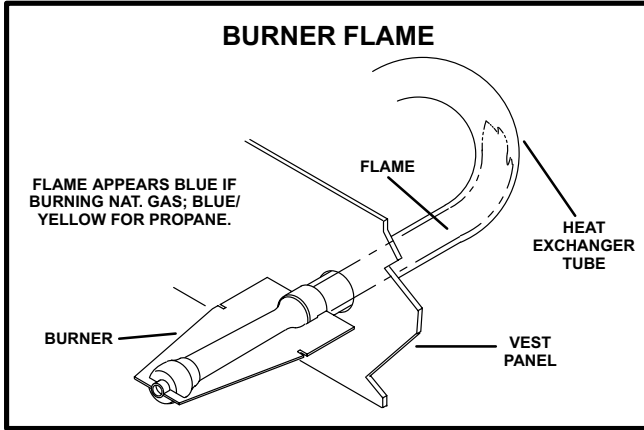
- 1 - Turn off electrical power to furnace.
- 2 - Remove unit access panel.
- 3 - Disconnect existing speed tap at control board speed terminal.  
**NOTE - TERMINATION OF ANY UNUSED MOTOR LEADS MUST BE INSULATED.**
- 4 - Refer to fan speed selection chart on unit wiring diagram for desired heating or cooling speed.
- 5 - Connect selected speed tap at control board speed terminal.
- 6 - Resecure blower access panel.
- 7 - Turn on electrical power to furnace.

### FLUE AND CHIMNEY

- 1 - Check flue pipe, chimney and all connections for tightness and to make sure there is no blockage.
- 2 - Check unit for proper draught.
- 3 - Is pressure switch closed? Obstructed flue will cause unit to shut off at pressure switch. Check flue and outlet for blockages.

**BURNER FLAME ADJUSTMENT**

The G24MCE burner flame is not adjustable; however, the flame should be inspected at the beginning of each heating season. If necessary, clean the burners. The burner flame should be blue when burning natural gas, and blue/yellow when burning propane gas. See figure 25.



**FIGURE 25**

**FAILURE TO OPERATE**

If unit fails to operate check the following:

- 1 - Is the thermostat calling for heat?
- 2 - Is the main isolator switch closed?
- 3 - Is there a blown fuse or tripped circuit breaker?
- 4 - Is the filter dirty or clogged? Dirty or clogged filters will cause the limit control to shut the unit off.
- 5 - Is gas turned on at the meter?
- 6 - Is manual main gas cock open?
- 7 - Is unit ignition system in lock out? If unit locks out again, call the service technician to inspect unit for blockages.

<b>Service</b>
<b>⚠ WARNING</b>
<b>Disconnect power before servicing unit.</b>
<b>⚠ CAUTION</b>
<b>Label all wires prior to disconnection when servicing controls. Wiring errors can cause improper and dangerous operation. Verify proper operation after servicing.</b>

At the beginning of each heating season, service items A through E as described below:

**A - ELECTRICAL**

- 1 - Check all wiring for loose connections.
- 2 - Check for correct voltage at the furnace (furnace operating).
- 3 - Check amp-draw on the fan motor.  
Motor Nameplate \_\_\_\_\_ Actual \_\_\_\_\_

**B - FANS**

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

**C - FILTERS**

All G24MCE filters are installed external to the unit. Filters should be inspected monthly. Clean or replace the filters when necessary to ensure proper furnace operation. See table 6 for filter sizes. Replacement filters for G24MCE-45/60/75 units must have a minimum velocity rating of 2 m/s (400 FPM). Replacement filters for G24MCE-100/120/140 units require a minimum velocity rating of 3 m/s (625 FPM).

**TABLE 6**

MODEL NO.	FILTER SIZE - millimeters (inches)
G24MCE-45/60/75	406X508X25 (16 X 20 X 1)
G24MCE-100/120/140	508X508X25 (20 X 20 X 1)

<b>⚠ WARNING</b>
<b>The fan door must be securely in place when the fan and burners are operating. Gas fumes, which could contain carbon monoxide, can be drawn into living space resulting in personal injury or death.</b>

**D - FLUE AND CHIMNEY**

Check the flue pipe, chimney and all connections for tightness and to make sure there is no blockage.

## E - BURNERS

Inspect the burners and burner flame at the beginning of each heating season. If necessary, clean the burners as indicated below:

- 1 - Turn off the electrical and gas supply to the furnace.
- 2 - Remove the burner box top.
- 3 - Remove the burner retaining bracket.
- 4 - Remove the burners.
- 5 - Clean the inside of each burner with a bottle brush as shown in figure 26.

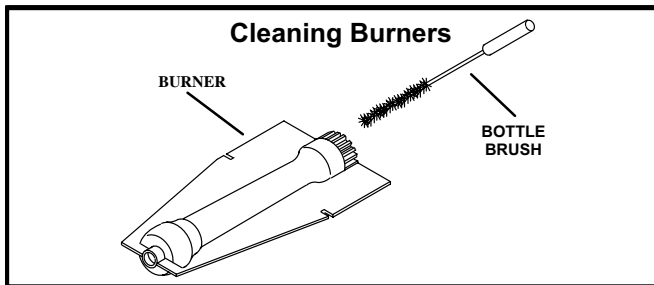


FIGURE 26

- 6 - Replace the burners and the burner retaining bracket. Make sure the burners are properly seated in the slots of the tray. The burner and manifold orifice must be aligned.
- 7 - Check the electrode gap using appropriately sized twist drills or feeler gauges. The gap should be between 2.79 and 3.56 mm (0.110 and 0.140 inches).
- 8 - Reinstall the burner box top.

### ⚠ CAUTION

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

- 9 - Restore electrical power and gas supply to the furnace. Follow lighting instructions on the front of the unit. Check the appearance of the burner flame, burner pressure, gas flow, and temperature rise. If necessary, make adjustments. See the other unit adjustments section.

## HEAT EXCHANGER

Periodically inspect the heat exchanger tubes and flue box for corrosion. If necessary, clean as indicated below:

- 1 - Turn off the electrical and gas supply to furnace.
- 2 - Disconnect wiring to combustion air blower.
- 3 - Remove the screws securing the flue box to the furnace. Clean the flue box with a wire brush (brass-bristle brush recommended), and rags or a shop vacuum cleaner.
- 4 - Disconnect the gas supply piping and the ignitor and sensor wires. Remove the burner assembly from the furnace.
- 5 - Since the heat exchanger tubes are crimped in several locations, a thorough cleaning of the entire length of each tube is not possible. However, remove any soot deposits which are accessible with a wire brush (brass-bristle brush recommended), and rags or a shop vacuum cleaner.
- 6 - Reinstall the flue box using a new gasket.
- 7 - Reconnect combustion air blower wiring.
- 8 - Reinstall the burner box, ignitor and sensor wires and the gas supply piping.
- 9 - Carefully check all piping connections (factory and field) for gas leaks. Use a leak detecting solution or other preferred means.

### ⚠ IMPORTANT

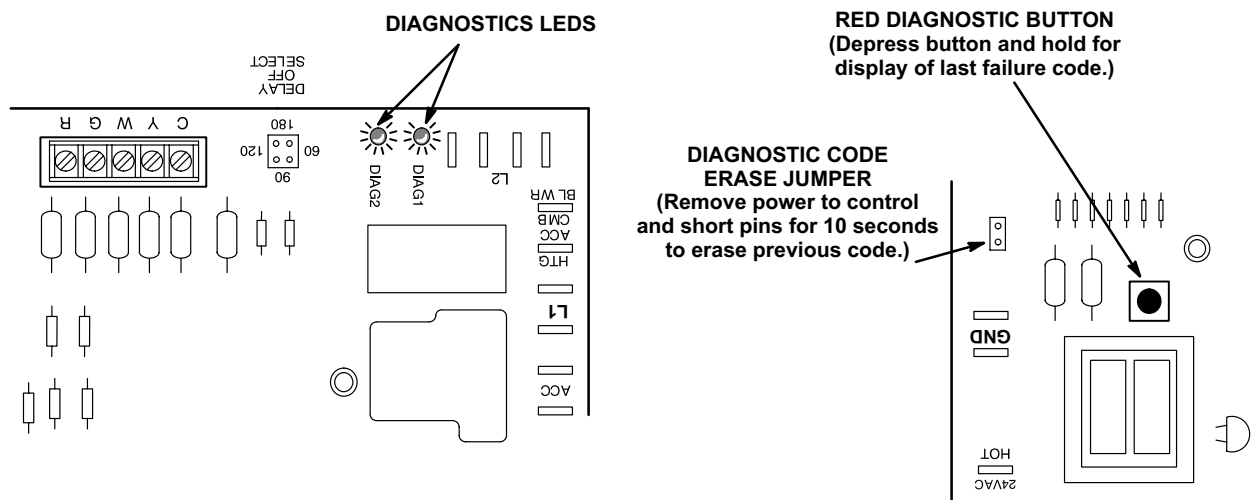
Some soaps used for leak detection are corrosive to certain metals. Carefully rinse piping thoroughly after leak test has been completed. Do not use matches, candles, flame or other sources of ignition to check for gas leaks.

- 10 - Restore electrical power and gas supply. Follow lighting instructions on front of unit. Check burner flame and adjust if necessary.

Technical Data Table									
NO.	DESCRIPTION	UNITS	-45	-60	3-75	4-75	-100	-120	-140
*1	INPUT RATING	kW	13.2	17.6	22	22	29.9	35.2	41.1
*2	OUTPUT RATING	kW	10.5	14	17.6	17.6	23.9	28.1	32.8
3	NUMBER OF INJECTORS		3	4	5	5	5	6	7
4	GAS CONNECTION SIZE	mm (INCHES)	13 (1/2)	13 (1/2)	13 (1/2)	13 (1/2)	13 (1/2)	13 (1/2)	13 (1/2)
5	FLUE ADAPTER SIZE	mm (INCHES)	102 (4)	102 (4)	102 (4)	102 (4)	102 (4)	102 (4)	102 (4)
6	WEIGHT	KG (LBS)	59 (130)	61 (135)	64 (140)	64 (140)	79 (175)	79 (175)	86 (190)
7	FAN MOTOR HP	WATTS (HP)	186 (1/4)	249 (1/3)	249 (1/3)	373 (1/2)	373 (1/2)	373 (1/2)	373 (1/2)
8	FAN MOTOR FLA	AMPS	1.6	2.6	2.6	3.42	3.42	3.42	3.42
9	COMBUSTION AIR MOTOR HP	WATTS (HP)	22 (0.03)	22 (0.03)	22 (0.03)	22 (0.03)	22 (0.03)	22 (0.03)	22 (0.03)
10	COMBUSTION AIR MOTOR FLA	AMPS	0.6	0.6	0.6	0.6	0.6	0.6	0.6
11	FAN WHEEL SIZE: DIA. X WIDTH	mm	229X178	254X178	254X203	279X203	305X229	305X229	305X229
12	FAN WHEEL SIZE: DIA. X WIDTH	INCHES	9X7	10X7	10X8	11X8	12X9	12X9	12X9
13	FAN SUPPLY PRESSURE - MAX	mBAR (WC")	1.24 (0.5)	1.24 (0.5)	1.24 (0.5)	1.24 (0.5)	1.24 (0.5)	1.24 (0.5)	1.24 (0.5)
14	INJECTOR SIZE	#MORSE (mm)	48 (1.93)	48 (1.93)	48 (1.93)	48 (1.93)	44 (2.18)	44 (2.18)	44 (2.18)
15	BURNER PRESSURE G20 GAS UK	mBAR (WC")	8.5 (3.4)	8.5 (3.4)	8.5 (3.4)	8.5 (3.4)	8.5 (3.4)	8.5 (3.4)	8.5 (3.4)
16	BURNER PRESSURE G25 GAS	mBAR (WC")	12.75 (5.1)	12.75 (5.1)	12.75 (5.1)	12.75 (5.1)	12.75 (5.1)	12.75 (5.1)	12.75 (5.1)
**17	CALORIFIC VALUE G20 GAS UK	MJ/cubic meters	37.78	37.78	37.78	37.78	37.78	37.78	37.78
**18	CALORIFIC VALUE G25 GAS	MJ/cubic meters	32.49	32.49	32.49	32.49	32.49	32.49	32.49
**19	GAS RATE G20 GAS UK	cubic meters/h	1.26	1.68	2.09	2.09	2.85	3.35	3.91
**20	GAS RATE G25 GAS	cubic meters/h	1.46	1.95	2.44	2.44	3.31	3.9	4.55
NOTE: FOR OPERATION WITH THIRD FAMILY GAS, USE ONLY MANUFACTURER SUPPLIED CONVERSION KITS:									
21	INJECTOR SIZE	#MORSE (mm)	56 (1.18)	56 (1.18)	56 (1.18)	56 (1.18)	*** (1.384)	*** (1.384)	*** (1.384)
22	BURNER PRESSURE G31	mBAR (WC")	23.5 (9.4)	23.5 (9.4)	23.5 (9.4)	23.5 (9.4)	22.0 (8.8)	22.0 (8.8)	22.0 (8.8)
23	CALORIFIC VALUE G31	MJ/kg	50.37	50.37	50.37	50.37	50.37	50.37	50.37
24	GAS RATE G31	kg/h	0.94	1.26	1.57	1.57	2.14	2.52	2.93
* DERATE 4% PER 305m (1000FT) FOR ALTITUDES GREATER THAN 610m (2000FT); e.g. AT ALTITUDE 1220M (4000FT) DERATE 16%									
** DRY GAS AT 15 deg C AND 1013.25 mBAR									
*** NO EQUIVALENT # MORSE									

# Ignition Control Board Diagnostic Codes

## EGC-3ACE INTEGRATED CONTROL BOARD



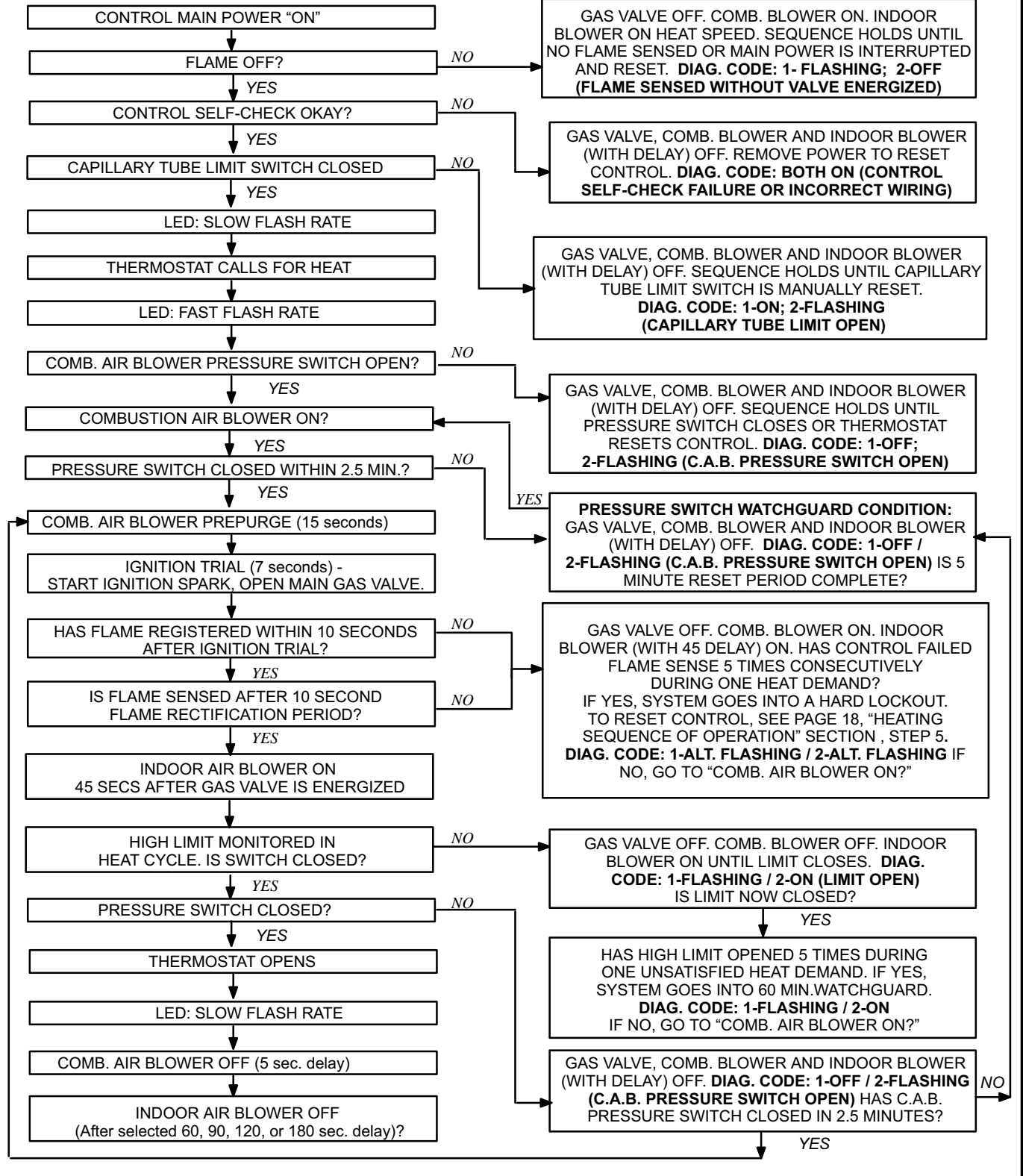
DSI BOARD DIAGNOSTIC PATTERNS	MODE INDICATION	STATUS
<b>DIAG 1</b> <b>Flashing Together</b> <b>DIAG 2</b> <b>Flashing Together</b>	Normal Operation	Slow flashing LED signifies normal operation. Fast flashing LED indicates a heating demand.
<b>DIAG 1</b> <b>Flashing</b> <b>DIAG 2</b> <b>On</b>	Limit Switch Open	This LED pattern indicates that either the primary or secondary limit switch has opened. Both switches auto-reset. System may be in Watchguard mode.
<b>DIAG 1</b> <b>Off</b> <b>DIAG 2</b> <b>Flashing</b>	Pressure Switch Open	This LED pattern indicates that the pressure switch opened during operation due to reduced flow of combustion products or a blocked condensate drain.
<b>DIAG 1</b> <b>Flashing Alternately</b> <b>DIAG 2</b> <b>Flashing Alternately</b>	Failed Ignition	Burners failed to ignite. The system is in *Hard Lockout mode.
<b>DIAG 1</b> <b>Flashing</b> <b>DIAG 2</b> <b>Off</b>	Flame Failure	This LED pattern indicates that a flame was sensed without power to the gas valve.
<b>DIAG 1</b> <b>On</b> <b>DIAG 2</b> <b>Flashing</b>	Flame Rollout/ Capillary Tube Limit Switch Open	This LED pattern indicates that the flame roll-out or capillary tube limit switch has opened. Manually reset the switch.
<b>DIAG 1</b> <b>Continuously on</b> <b>DIAG 2</b> <b>Continuously on</b>	Control Board Failure	The system is in *Hard Lockout mode. Run cycle. Check control wiring and replace the control board, if necessary.

\*Hard Lockout Mode Reset Sequence : 1 - Turn off the power to the furnace; 2 - Move thermostat control from "HEAT" to "OFF" position; 3 - Turn on the power to the furnace; 4 - Move thermostat control from "OFF" to "HEAT" position.

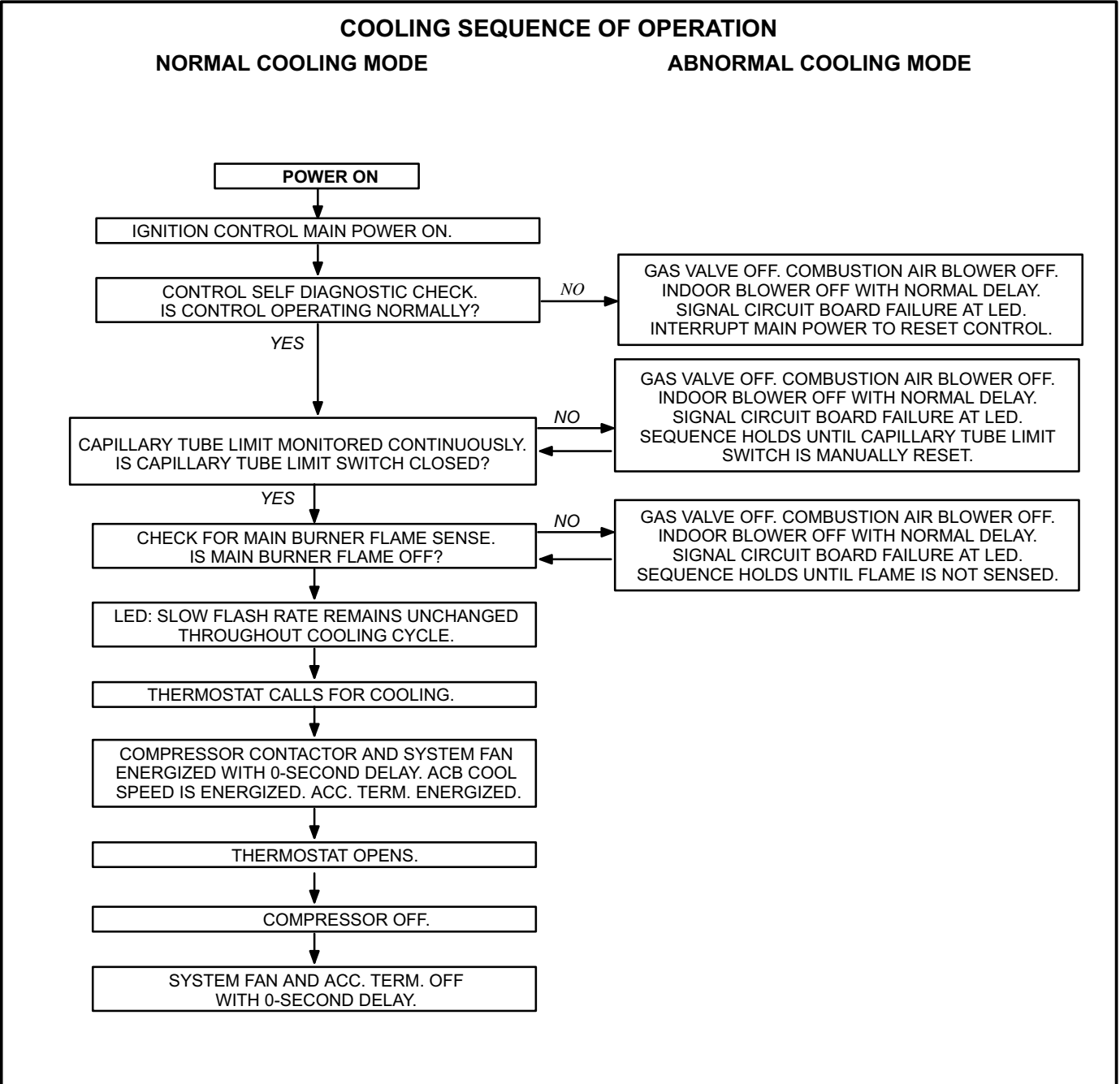
**HEATING SEQUENCE OF OPERATION**

**NORMAL HEATING MODE**

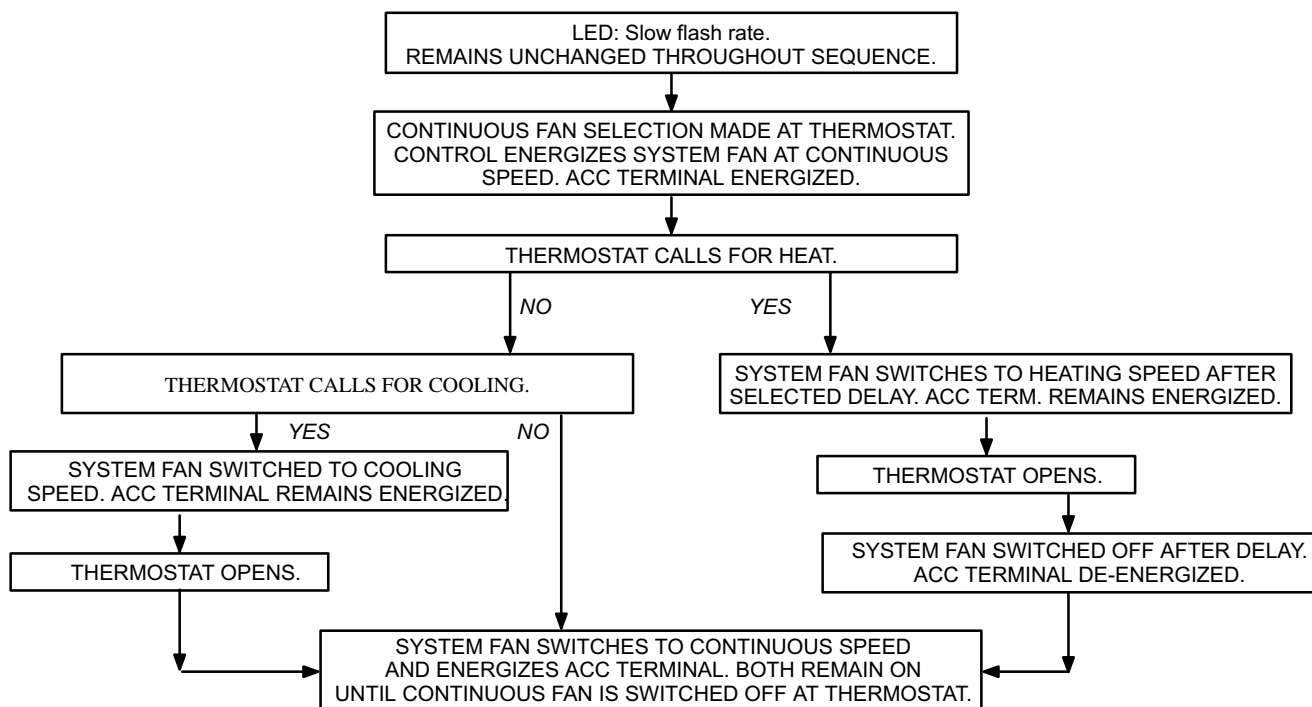
**ABNORMAL HEATING MODE**







### CONTINUOUS LOW SPEED FAN SEQUENCE OF OPERATION



## 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 rating plate — Example: G24MCE3-75-1T. Refer to figure 27 for parts identification.

### CABINET PARTS

Door chain  
 Front louver door  
 Fan access panel  
 Cabinet cap  
 Cabinet bottom

Flue adapter

### ELECTRICAL PARTS

Transformer  
 Control board (Direct Spark Ignition)  
 Door interlock switch  
 Terminal strip

### SUPPLY AIR FAN PARTS

Fan wheel  
 Motor  
 Fan housing cut-off plate  
 Motor capacitor

### HEATING PARTS

Heat exchanger  
 Main burners  
 Main burner orifices  
 Gas manifold/Burner box assembly  
 Gas valve  
 Flame sensor

Ignition cable  
 Direct spark ignitor  
 Flue baffles (45/60/75 only)  
 High limit control  
 Capillary tube limit  
 Pressure switch  
 Wire harness plug / cap  
 Flue box  
 Combustion air fan  
 Gaskets

## G24MCE Parts Arrangement

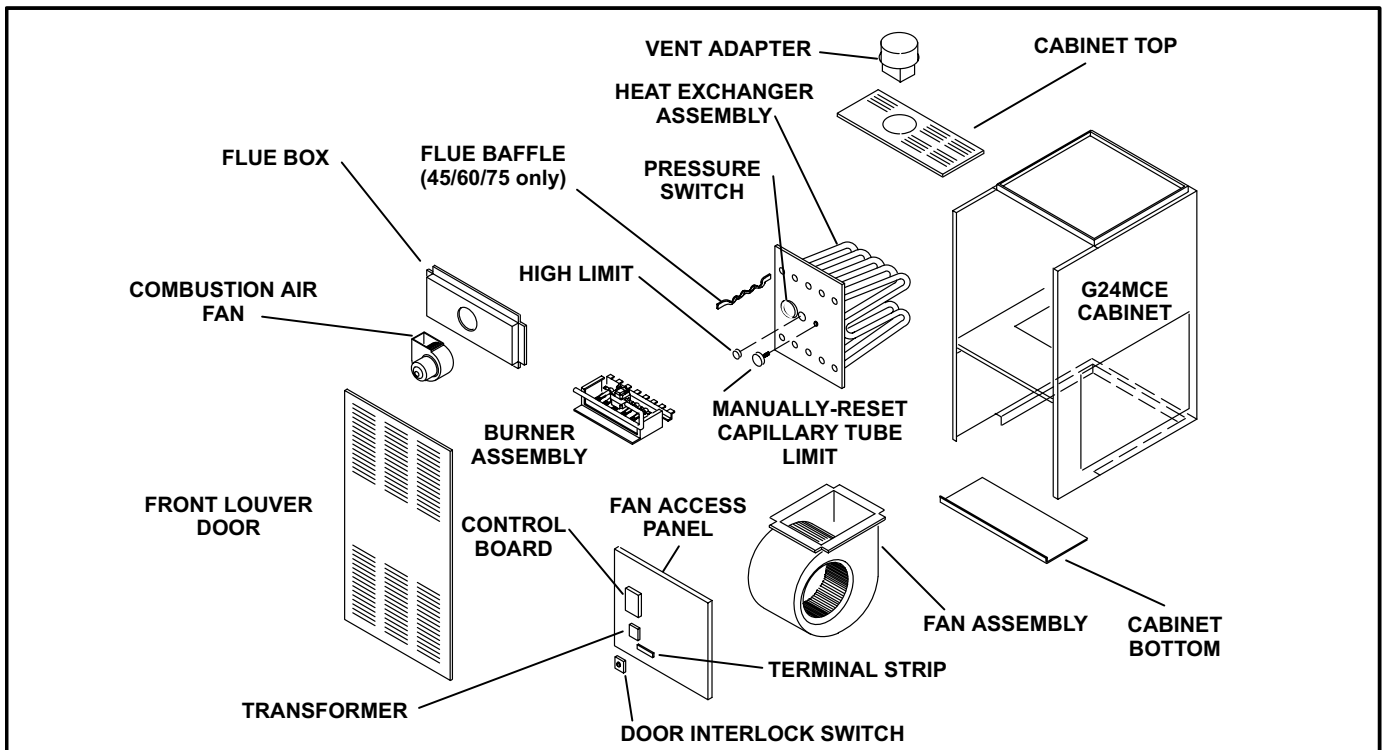


FIGURE 27

## G24MCE Start-up and Performance Check List

Job Name \_\_\_\_\_ Job No. \_\_\_\_\_ Date \_\_\_\_\_  
Job Location \_\_\_\_\_ City \_\_\_\_\_ State/Province \_\_\_\_\_  
Installer \_\_\_\_\_ City \_\_\_\_\_ State/Province \_\_\_\_\_  
Unit Model No. \_\_\_\_\_ Serial No. \_\_\_\_\_ Serviceman \_\_\_\_\_

### HEATING SECTION

Electrical Connections Tight?  Supply Voltage \_\_\_\_\_  
fan Motor Amps \_\_\_\_\_ fan Motor H.P./Kw \_\_\_\_\_  
Fan Motor Lubrication OK?   
Gas Piping Connections Tight & Leaks Tested?   
Fuel Type: Natural Gas?  LP/Propane Gas?   
Furnace kW Input \_\_\_\_\_ Line Pressure \_\_\_\_\_  
Regulator Pressure w.c./mBAR -- Nat. \_\_\_\_\_ w.c./mBAR -- LP/Propane \_\_\_\_\_  
Air Shutters Properly Adjusted (If Installed)?   
Connections Tight?  Proper draught?   
Fan Control Setting (45 Seconds Fixed On) \_\_\_\_\_ Fan Control Off Setting \_\_\_\_\_  
Temperature Rise \_\_\_\_\_ Filter Clean & Secure?  Vent Clear?

### THERMOSTAT

Calibrated?  Heat Anticipator Properly Set?  Level?