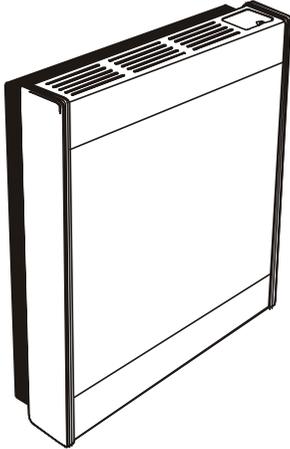




# INSTALLATION INSTRUCTIONS AND OWNER'S MANUAL



## GRAVITY DIRECT VENT WALL FURNACE

**MODELS**  
**MV 120**  
**MV 130**  
**MV 145**



**EFFECTIVE DATE**  
**APRIL, 2003**

**WARNING:** If the information in these instructions are not followed exactly, a fire or explosion may result causing property damage, personal injury or loss of life.

- Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.
- **WHAT TO DO IF YOU SMELL GAS**
  - Do not try to light any appliance.
  - Do not touch any electrical switch; do not use any phone in your building.
  - Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
  - If you cannot reach your gas supplier, call the fire department.
- Installation and service must be performed by a qualified installer, service agency or the gas supplier.

This appliance is only for use with the type of gas indicated on the rating plate. This appliance is not convertible for use with other gases, unless a certified kit is used.

**WARNING:** If not installed, operated and maintained in accordance with the manufacturer's instructions, this product could expose you to substances in fuel or from fuel combustion which can cause death or serious illness.

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# IMPORTANT SAFETY INFORMATION

## THIS IS A HEATING APPLIANCE

DO NOT OPERATE THIS APPLIANCE WITHOUT FRONT PANEL INSTALLED.

- Due to high temperatures the appliance should be located out of traffic and away from furniture and draperies.
- Children and adults should be alerted to the hazards of high surface temperatures and should stay away to avoid burns or clothing ignition.
- Young children should be carefully supervised when they are in the same room as the appliance.
- Clothing or other flammable material should not be placed on or near the appliance.
- Any safety screen or guard removed for servicing an appliance must be replaced prior to operating the appliance.
- Keep burner and control compartment clean.
- Vent cap hot while furnace is in operation.
- Installation and repair should be done by a **QUALIFIED SERVICE PERSON**. The appliance should be inspected before use and at least annually by a qualified service person. More frequent cleaning may be required due to excessive lint from carpeting, bedding materials, etc. It is imperative that control compartments, burners and circulating air passageways of the appliance be kept clean.
- **DO NOT** put anything around the furnace that will obstruct the flow of combustion and ventilation air.
- **DO** keep the appliance area clear and free from combustible material, gasoline and other flammable vapors and liquids.
- **DO** examine venting system periodically and replace damaged parts.
- **DO** make a periodic visual check of pilot and burner. Clean and replace damaged parts.
- **CAUTION:** Pilot hole cover must be kept tightly closed during operation.
- **DO NOT** use this heater if any part has been under water. Immediately call a qualified service technician to inspect the heater and to replace any part of the control system and any gas control which has been under water.

# SAFETY INFORMATION FOR USERS OF LP-GAS

Propane (LP-Gas) is a flammable gas which can cause fires and explosions. In its natural state, propane is odorless and colorless. You may not know all the following safety precautions which can protect both you and your family from an accident. Read them carefully now, then review them point by point with the members of your household.

Someday when there may not be a minute to lose, everyone's safety will depend on knowing exactly what to do. If, after reading the following information, you feel you still need more information, please contact your gas supplier.

## LP-GAS WARNING ODOR

**If a gas leak happens, you should be able to smell the gas because of the odorant put in the LP-Gas. That's your signal to go into immediate action!**

- Do not operate electric switches, light matches, use your phone. Do not do anything that could ignite the gas.
- Get everyone out of the building or area. Do that IMMEDIATELY.
- Close all gas tank or cylinder supply valves.
- LP-Gas is heavier than air and may settle in low areas such as basements. When you have reason to suspect a gas leak, keep out of basements and other low areas. Stay out until firefighters declare them to be safe.
- Use your neighbor's phone and call a trained LP-Gas service person and the fire department. Even though you may not continue to smell gas, do not turn on the gas again. Do not re-enter the building or area.
- Finally, let the service man and firefighters check for escaped gas. Have them air out the area before you return. Properly trained LP-Gas service people should repair the leak, then check and relight the gas appliance for you.

## NO ODOR DETECTED - ODOR FADE

**Some people cannot smell well. Some people cannot smell the odor of the chemical put into the gas. You must find out if you can smell the odorant in propane.** Smoking can decrease your ability to smell. Being around an odor for a time can affect your sensitivity or ability to detect that odor. Sometimes other odors in the area mask the gas odor. People may not smell the gas odor or their minds are on something else. Thinking about smelling a gas odor can make it easier to smell.

**The odorant in LP-gas is colorless, and it can fade under some circumstances.** For example, if there is an underground leak, the movement of the gas through soil can filter the

odorant. Odorants in LP-Gas also are subject to oxidation. This fading can occur if there is rust inside the storage tank or in iron gas pipes.

The odorant in escaped gas can adsorb or absorb onto or into walls, masonry and other materials and fabrics in a room. That will take some of the odorant out of the gas, reducing its odor intensity.

LP-Gas may stratify in a closed area, and the odor intensity could vary at different levels. Since it is heavier than air, there may be more odor at lower levels. Always be sensitive to the slightest gas odor. If you detect any odor, treat it as a serious leak. Immediately go into action as instructed earlier.

## SOME POINTS TO REMEMBER

- **Learn to recognize the odor of LP-gas.** Your local LP-Gas Dealer can give you a "Scratch and Sniff" pamphlet. Use it to find out what the propane odor smells like. If you suspect that your LP-Gas has a weak or abnormal odor, call your LP-Gas Dealer.
- If you are not qualified, do not light pilot lights, perform service, or make adjustments to appliances on the LP-Gas system. If you are qualified, consciously think about the odor of LP-Gas prior to and while lighting pilot lights or performing service or making adjustments.
- Sometimes a basement or a closed-up house has a musty smell that can cover up the LP-Gas odor. Do not try to light pilot lights, perform service, or make adjustments in an area where the conditions are such that you may not detect the odor if there has been a leak of LP-Gas.
- Odor fade, due to oxidation by rust or adsorption on walls of new cylinders and tanks, is possible. Therefore, people should be particularly alert and careful when new tanks or cylinders are placed in service. Odor fade can occur in new tanks, or reinstalled old tanks, if they are filled and allowed to set too long before refilling. Cylinders and tanks which have been out of service for a time may develop internal rust which will cause odor fade. If such conditions are suspected to exist, a periodic sniff test of the gas is advisable. **If you have any question about the gas odor, call your LP-gas dealer. A periodic sniff test of the LP-gas is a good safety measure under any condition.**
- If, at any time, you do not smell the LP-Gas odorant and you think you should, assume you have a leak. Then take the same immediate action recommended above for the occasion when you do detect the odorized LP-Gas.
- If you experience a complete "gas out," (the container is under no vapor pressure), turn the tank valve off immediately. If the container valve is left on, the container may draw in some air through openings such as pilot light orifices. If this occurs, some new internal rusting could occur. If the valve is left open, then treat the container as a new tank. Always be sure your container is under vapor pressure by turning it off at the container before it goes completely empty or having it refilled before it is completely empty.

# INTRODUCTION

## Introduction

Always consult your local Building Department regarding regulations, codes or ordinances which apply to the installation of a direct vent wall furnace.

## Instructions to Installer

1. Installer must leave instruction manual with owner after installation.
2. Installer must have owner fill out and mail warranty card supplied with furnace.
3. Installer should show owner how to start and operate furnace and thermostat.

### Warning:

**Any change to this furnace or its control can be dangerous. This is a heating appliance and any panel, door or guard removed for servicing an appliance must be replaced prior to operating the appliance.**

## General Information

This furnace is design certified in accordance with American National Standard/CSA Standard Z21.86b and CSA 2.32b-2002 by the Canadian Standard Association, as a Gravity Direct Vent Wall Furnace to be installed on an outside wall according to these instructions.

**Any alteration of the original design, installed other than as shown in these instructions or use with a type of gas not shown on the rating plate is the responsibility of the person and company making the change.**

## Important

All correspondence should refer to complete Model No., Serial No. and type of gas.

**Notice:** During initial firing of this unit, its paint will bake out and smoke will occur. To prevent triggering of smoke alarms, ventilate the room in which the unit is installed.

## Installation in Residential Garages

Gas utilization equipment in residential garages shall be installed so that all burners and burner ignition devices are located not less than 18" (457 mm) above the floor.

Such equipment shall be located, or protected, so it is not subject to physical damage by a moving vehicle.

## Qualified Installing Agency

Installation and replacement of gas piping, gas utilization equipment or accessories and repair and servicing of equipment shall be performed only by a qualified agency. The term "qualified agency" means any individual, firm, corporation or company which either in person or through a representative is engaged in and is responsible for (a) the installation or replacement of gas piping or (b) the connection, installation, repair or servicing of equipment, who is experienced in such work, familiar with all precautions required and has complied with all the requirements of the authority having jurisdiction.

The installation must conform with local codes or, in the absence of local codes, with the National Fuel Gas Code ANSI Z223.1/NFPA 54\* Natural Gas and Propane Installation Code, CSAB149.1.

*\*Available from the American National Standards Institute, Inc., 11 West 42nd St., New York, NY 10036.*

## High Altitudes

For altitudes/elevations above 2,000 feet (609.9 m), input ratings should be reduced at the rate of 4 percent for each 1,000 (305m) feet above sea level. Canadian High Altitudes for locations having an elevation above mean sea level between 2,000 feet (609.9 m) and 4,500 feet (1370m), use orifices as indicated in the following table:

MOD	0-2000feet (0-610 m)		2000-4500 feet (610-1370 m)	
	NG	LPG	NG	LPG
MV 120	0.053" (1.35 mm)	0.035" (0.88 mm)	0.050" (1.27 mm)	0.033" (0.83 mm)
MV 130	0.070" (1.77 mm)	0.043" (1.10 mm)	0.066" (1.67 mm)	0.041" (1.03 mm)
MV 145	0.077" (1.95 mm)	0.053" (1.35 mm)	0.072" (1.83 mm)	0.050" (1.27 mm)

# SPECIFICATIONS

Model	MV 145	MV 130	MV 120
<b>Input BTU/HR (KW)</b>	20,000 (5.81)	14,000 (4.07)	8,400 (2.44)
<b>Min. Input BTU/HR (KW)</b>	6,900 (2.00)	6,000 (1.74)	3,800 (1.10)
<b>Efficiency Rating* (%)</b>	72%	72%	72%
<b>Height (inches / mm)</b>	24.4 / 620	24.4 / 620	24.4 / 620
<b>Width (inches / mm)</b>	27.3 / 688	27.3 / 688	21.2 / 538
<b>Depth (inches / mm)</b>	6.75 / 170	6.75 / 170	6.75 / 170
<b>Gas Inlet</b>	3/8" NPT	3/8" NPT	3/8" NPT
<b>Input Vent Diameter (inches / mm)</b>	6 1/4" (160 mm)	4 3/4" (121 mm)	3 9/16" (90 mm)
<b>Output Vent Diameter (inches / mm)</b>	3 1/2" (89 mm)	2 5/8" (67 mm)	2 1/8" (54 mm)

\*The efficiency rating of the appliance is a product thermal efficiency determined under continuous operating conditions and was determined independently of any installed system.

# GAS SUPPLY

## Locating Gas Supply

The gas line can enter the unit either through the floor or outside wall. The gas line opening should be made at this time. Location of the opening will be determined by the position of floor joists and the valve and union used for servicing.

**Recommended Gas Pipe Diameter**

Pipe Length (Feet)	Schedule 40 Pipe Inside Diameter		Tubing, Type L Outside Diameter	
	Nat.	L.P.	Nat.	L.P.
	0 - 10	1/2" 1.3 cm	3/8" 1.0 cm	1/2" 1.3 cm
10 - 40	1/2" 1.3 cm	1/2" 1.3 cm	5/8" 1.6 cm	1/2" 1.3 cm
40 - 100	1/2" 1.3 cm	1/2" 1.3 cm	3/4" 1.9 cm	1/2" 1.3 cm
100 - 150	3/4" 1.9 cm	1/2" 1.3 cm	7/8" 2.2 cm	3/4" 1.9 cm

**Note:** Never use plastic pipe. Check to confirm whether your local codes allow copper tubing or galvanized.

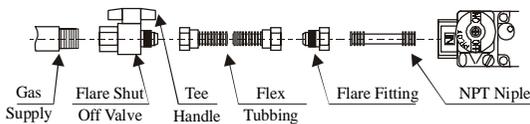
**Note:** Since some municipalities have additional local codes, it is always best to consult your local authority and installation code.

The use of the following gas connectors is recommended:

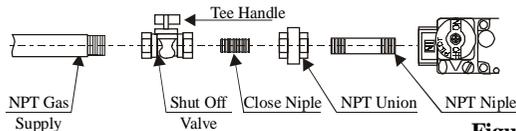
- ANS Z21.24 Appliance Connectors of Corrugated Metal Tubing and Fittings
- ANS Z21.45 Assembled Flexible Appliance Connectors of Other Than All-Metal Construction

The above connectors may be used if acceptable by the authority having jurisdiction. The state of Massachusetts requires that a flexible appliance connector cannot exceed three feet in length.

### FLEXIBLE GAS LINE CONNECTION



### RIGID GAS LINE CONNECTION



**Figure 1**

Consult the current National Fuel Gas Code, ANSI Z223.1 CAN/CGA-B149 (.1 or .2) installation code.

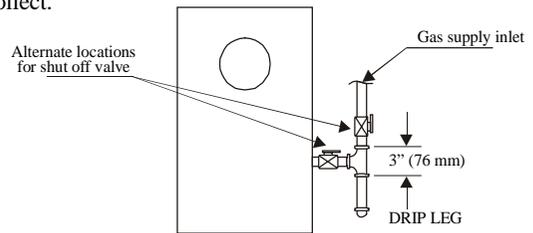
## Installing a New Main Gas Cock

Each appliance should have its own manual gas cock. In the state of Massachusetts the gas cock must be a T handle type. A manual main gas cock should be located in the vicinity of the unit. Where none exists, or where its size or location is not adequate, contact your local authorized installer for installation or relocation.

Compounds used on threaded joints of gas piping shall be resistant to the action of liquefied petroleum gases. The gas lines must be checked for leaks by the installer. This should be done with a soap solution watching for bubbles on all exposed connections, and if unexposed, a pressure test should be made.

**Never use an exposed flame to check for leaks. Appliance must be disconnected from piping at inlet of control valve and pipe capped or plugged for pressure test. Never pressure test with the appliance connected; control valve will sustain damage!**

A gas valve and ground joint union should be installed in the gas line upstream of the gas control to aid in servicing. It is required by the National Fuel Gas Code that a drip line be installed near the gas inlet. This should consist of a vertical length of pipe tee connected into the gas line that is capped on the bottom in which condensation and foreign particles may collect.



**Figure 2**

## Pressure Testing of the Gas Supply System

1. To check the inlet pressure to the gas valve, a 1/8" (3 mm) N.P.T. plugged tapping, accessible for test gauge connection, must be placed immediately upstream of the gas supply connection to the appliance.
2. The appliance and its individual shutoff valve must be disconnected from the gas supply piping system during any pressure testing of that system at test pressures in excess of 1/2 psig (3.5 kPa).
3. The appliance must be isolated from the gas supply piping system by closing its individual manual shutoff valve during any pressure testing of the gas supply piping system at test pressures equal to or less than 1/2 psig (3.5 kPa).

**Attention!** If one of the above procedures results in pressures in excess of 1/2 psig (14" w.c.) (3.5 kPa) on the appliance gas valve, it will result in a hazardous condition.

## Checking Manifold Pressure

Both Propane and Natural gas valves have a built-in pressure regulator in the gas valve. Natural gas models will have a manifold pressure of approximately 4.0" w.c.(.996kPa) at the valve outlet with the inlet pressure to the valve from a minimum of 5.0" w.c.(1.245kPa) for the purpose of input adjustment to a maximum of 10.5" w.c.(2.61kPa). Propane gas models will have a manifold pressure approximately 10.0" w.c.(2.49kPa) at the valve outlet with the inlet pressure to the valve from a minimum of 11.0" w.c.(2.739kPa) for the purpose of input adjustment to a maximum of 13.0" w.c.(3.237kPa). A 1/8" (3mm) N.P.T. plugged tapping, accessible for test gauge connection, is located on the outlet side of the gas control.

# CLEARANCES

1. In selecting a location for installation, it is necessary to provide adequate accessibility clearances for servicing and proper installation. In order to that, at least 6" (152 mm) should be left clear from the wall on right side of the cabinet and 4" (101 mm) on left side.
2. Unit is supported by a wall support plate secured to the wall.
3. The minimum clearances from casing to combustible construction is 36" (914 mm) on top, 4" (102 mm) on each side and 4" (102 mm) from the floor or from the top surface of carpeting, tile or other floor covering and 0" (0 mm) to rear wall.
4. The minimum distance from the center of the vent cap to the nearest outside corner or obstruction is 16" (407 mm).
5. The MV 120, MV 130 and MV 145 minimum wall depth is 4 1/2" (114 mm) and the maximum is 12" (305 mm). The

use of tubes not supplied by the manufacturer results in unsatisfactory performance.

The vent cap of a direct vent appliance, with an input of 10,000 Btu/h (3 kW/h) or less shall be located at least 6" (150 mm) from any opening through which flue gases could enter a building; for appliances up to 50,000 Btu/h (14.6 KW/h) this distance shall be at least 9" (229 mm). The bottom of the vent cap and the air intake shall be located at least 12" (305mm) above grade.

**WARNING: The nearest point of the vent cap should be a minimum horizontal distant of six (6) feet (1.83m) from any pressure regulator. In case of regulator malfunction, the six (6) feet (1.83m) distance will reduce the chance of gas entering the vent cap.**

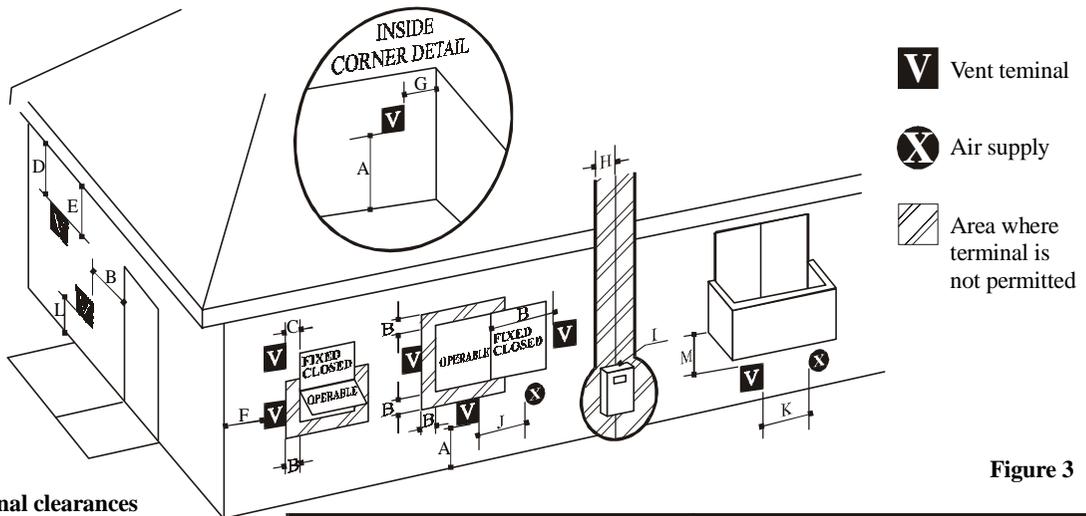


Figure 3

Vent terminal clearances

	CANADIAN INSTALLATIONS <sup>1</sup>	US INSTALLATIONS <sup>2</sup>
A= clearance above grade, veranda, porch, deck or balcony	12" (30 cm)	12" (30 cm)
B= clearance to window or door that may be opened	6" (15 cm) for appliances ≤ 10,000 Btu/h (3 kW), 12" (30 cm) for appliances > 10,000 Btu/h (3 kW) and ≤ 100,000 Btu/h (30 kW)	6" (15 cm) for appliances ≤ 10,000 Btu/h (3 kW), 9" (23 cm) for appliances > 10,000 Btu/h (3 kW) and ≤ 50,000 Btu/h (15 kW)
C= clearance to permanently closed window	clearance in accordance with local installation codes and the requirements of the gas supplier	clearance in accordance with local installation codes and the requirements of the gas supplier
D= vertical clearance to ventilated soffit located above the terminal within a horizontal distance of 2 feet (61 cm) from the center line of the terminal		
E= clearance to unventilated soffit		
F= clearance to outside corner		
G= clearance to inside corner		
H= clearance to each side of center line extended above meter/regulator assembly	3 feet (91 cm) within a height 15 feet (4.5 m) above meter/regulator assembly	clearance in accordance with local installation codes and the requirements of the gas supplier
I= clearance to service regulator vent outlet	3 feet (91 cm)	

# CLEARANCES (cont.)

	CANADIAN INSTALLATIONS <sup>1</sup>	US INSTALLATIONS <sup>2</sup>
<b>J</b> = clearance to nonmechanical air supply inlet to building or the combustion air inlet to any other appliance	6" (15 cm) for appliances ≤ 10,000 Btu/h (3 kW), 12" (30 cm) for appliances > 10,000 Btu/h (3 kW) and ≤ 100,000 Btu/h (30 kW)	6" (15 cm) for appliances ≤ 10,000 Btu/h (3 kW), 9" (23 cm) for appliances > 10,000 Btu/h (3 kW) and ≤ 50,000 Btu/h (15 kW)
<b>K</b> = clearance to a mechanical air supply inlet	6 feet (1.83 m)	3 feet (91 cm) above if within 10 feet (3 m) horizontally
<b>L</b> = clearance above paved sidewalk or paved driveway located on public property	7 feet (2.13 m) <sup>3</sup>	clearance in accordance with local installation codes and the requirements of the gas supplier
<b>M</b> = clearance under veranda, porch deck, or balcony	12" (30 cm) <sup>4</sup>	

1 In accordance with the current CSA B149.1, *Natural Gas and Propane Installation Code*.  
 2 In accordance with the current ANSI Z223.1/NFPA 54, *National Fuel Gas Code*.  
 3 A vent shall not terminate directly above sidewalk or paved driveway that is located between two

single family dwellings and serves both dwellings.  
 4 Permitted only if veranda, porch, deck, or balcony is fully open on a minimum of two sides beneath the floor.

# INSTALLATION INSTRUCTIONS

## Location of Furnace

The heater must be on an outside wall in the room to be heated. When choosing a location for the furnace please remember that the vent cap supplied with the unit must be installed without alteration, with the exception of cutting the vent tubes and insulation to length, as directed in these instructions. The outside vent cap needs to be flush to the wall, so select a relatively smooth exterior surface.

Since this appliance is a direct vent (balanced flue) design, all combustion and ventilation air is drawn from outside of the structure. No special considerations for combustion are necessary inside the structure. Once you have determined that the exterior vent will meet the clearances above, you must locate the heater on the inside wall of the room to be heated. Begin the installation by locating the wall studs on the inside wall of the structure. Find the centerlines between the studs where you want the unit to be mounted.

## Locating Wall Opening

A full scale template is furnished with the unit which illustrates the vent and gas supply openings and mounting holes in their correct locations on the wall.

**Note:** the figure 4 gives the required dimensions for mounting the unit, in the event that the template is unusable or lost.

Place the template on the wall so that the vent opening will be located between the studs and, in the case of the MV 130, for example, the bracket mounting holes are over the studs (16" / 406 mm, on center). **DO NOT CUT THE WALL STUDS IN ORDER TO INSTALL THE UNIT.** Place the bottom edge of the template directly on the floor or the floor covering such as carpeting or tile.

## Installing the Unit

Make sure that the location you have selected for the furnace complies the requirements above before its installation.

This gas appliance must not be connected to a chimney flue

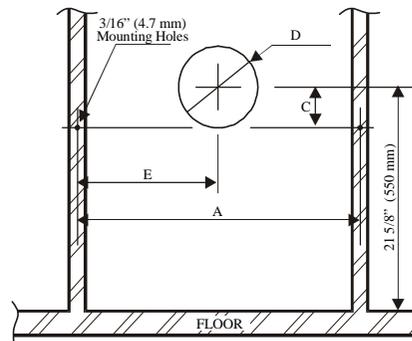


Figure 4

MOD	A	C	D	E
MV 120	10 1/4" (260 mm)	4 1/4" (108 mm)	5 1/2" (140 mm)	6 1/8" (155 mm)
MV 130	16" (406 mm)	4 1/4" (108 mm)	6 3/4" (171 mm)	9" (230 mm)
MV 145	16" (406 mm)	3 3/4" (98 mm)	8 1/2" (216 mm)	9" (230 mm)

serving a separate solid-fuel burning appliance.

## Cutting the Vent Hole

Begin the installation by locating the wall studs on the side wall of the structure. Find the centerlines between the studs where you want the unit to be mounted. Refer to the following illustration (Figure 5) for a side view of how the finished installation should look. This appliance is certified for installation on walls which are a maximum of 12" (305 mm) thick. The vent assembly supplied with the unit will accommodate walls up to that thickness.

With the template flat and level against the inside wall, mark the location for the opening for the vent assembly as well as the location of the two holes for mounting the wall support plate and the one for the gas supply, if the supply is to be through the wall. If desired, (and in accordance with all applicable building and plumbing codes) the gas piping can be brought into the room through the floor underneath the unit.

Remove the template from the wall and with a long drill, make a hole in the center of the opening for ventilation all the way through inside and outside wall. Trace the wall opening in

# INSTALLATION INSTRUCTIONS (cont.)

the indicated diameter in both walls and cut them. Your hole will be about 1 to 2" (26 to 52 mm), depending on the unit model, larger in diameter than the vent pipe.

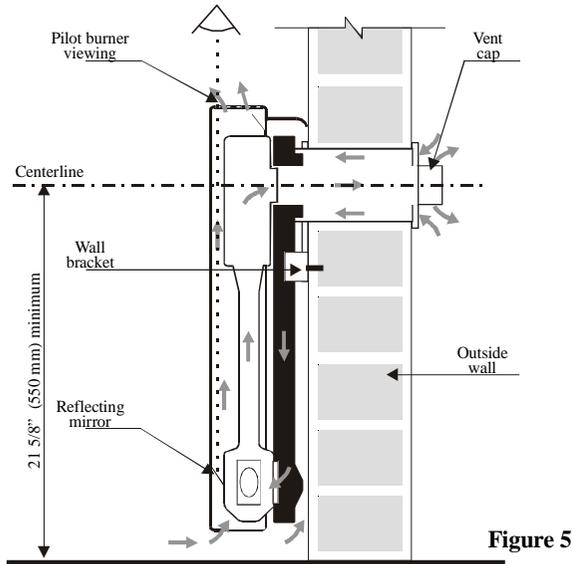


Figure 5

Make sure the two holes (in the inside and the outside wall) are concentric to one another and line up. If the opening in the outside wall is higher than the opening in the inside wall, water from rain or from lawn sprinklers could enter the vent cap and drip back into the heater, causing it to rust out. Use a carpenter's level and square to confirm that the two holes are level and in line with one another.

If the vent cap is to be installed on shingles or clapboards, or if it appears that a projection within 6" (152.4 mm) of the air inlet section could shield the air inlet, the entire vent should be supported away from the wall as shown in Figure 6.

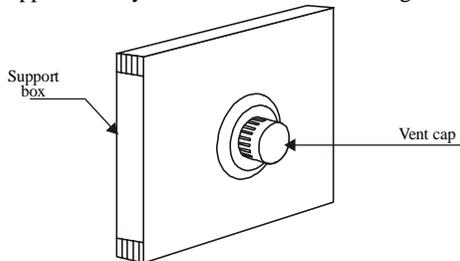


Figure 6

For the siding extension kit please contact our Parts Department.

**Note:** the vent assembly of MV 145 units has off-centre tubes and must be installed in a certain position. Make sure the arrow engraved on its ring is located in the upper position. If not, connecting the inner pipe in the appliance won't be possible.

## Marking and cutting the vent pipes to the proper length

From the outside of the building, push the vent assembly through the hole until the vent cap flange is against the outer

wall and fasten the vent cap to the wall using the 4 screws (provided with the unit) in the holes prepared in the vent cap plate.

Making certain that the vent cap is flushed to the outer wall, draw a line all the way around the vent pipe where it comes through the inside wall. (**Note: this line only marks the point where the pipe comes through the wall. It is not where you will cut the pipes.**)

Remove the vent assembly from the wall. Measure 7/16" (11 mm) from the line just made and make a mark towards the open end of the pipe.

Mark several spots around the pipe insulation at this 7/16" (11 mm) distance and then tape a sheet of paper around the pipe at this time to assure an even cut.

Use a cutter knife to cut only the insulation and its lining and a hack saw or tin snips to cut the larger pipe at the cut line on the edge of the paper.

Cut a clean, straight line on the outside tube, being careful not to crimp or deform the tube.

**It is very important that this be a clean straight cut for the heater to perform properly.**

On MV 120 and MV 130 units, you must proceed to cut the insulation again through the line originally traced (flush line of the inner wall, 7/16" back from the cut end of the tube). (See drawing)

On MV145 units, you must proceed to cut the lower edge of the insulation (only this part, not the complete circumference) to allow the ventilation come through the wall mounting support bar. Cut according following drawing:

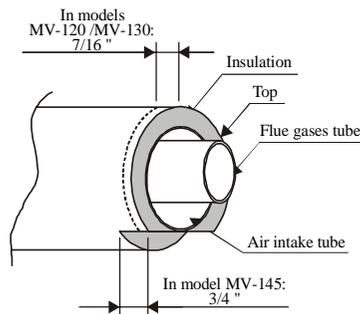


Figure 7

Measure now 2" (50.8 mm) from the cut end of the larger pipe and make a mark on the inner pipe. Be certain that the inner pipe is thoroughly marked so that it will be 2" (50.8 mm) longer than the larger pipe when cut. The inner pipe needs to be cut with a hacksaw.

**Remember to remove the vent assembly from the wall in order to cut the tubes**

## Installing the vent assembly and wall support plate

In case outside wall is of tiled wood construction, rough or unlevelled, the use of silicone sealing compound to avoid

# INSTALLATION INSTRUCTIONS (cont.)

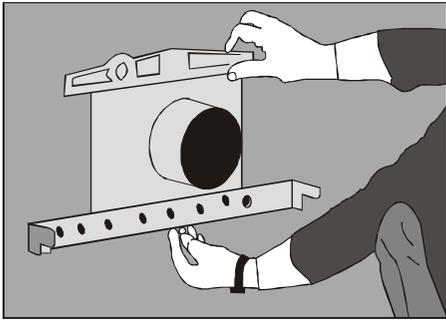


Figure 8

eventual water filtration or the entrance of bugs is necessary.

Press the flange against the outer wall surface and fasten the vent cap to the wall using the 4 screws (provided with the unit) in the holes prepared in the vent cap plate. Once the vent is secured to the wall, proceed filling the gaps between the vent plate and the wall with silicone sealing compound.

Inside the building, place the wall support plate (which is taped inside the cabinet during shipment) over the open end of the vent pipe and push the plate firmly against the interior wall.

**You might need to handle the introduction of the larger pipe into the hole of the support plate with your fingers since the pipe could have suffered some minor deformation through the cutting process.**

Now level the plate with carpenter level and mark the mounting holes with a pencil (see Figure 8). Remove the wall support plate from the vent pipe and drill the two holes with the appropriate drill bit.

Place the wall support plate over the vent pipe again and affix the plate to the wall using the two screws provided with the unit.

**Note: hollow wall fasteners (also supplied with the unit) are necessary for model MV 120. Models MV 130 and MV 145 can be mounted on the wall studs.**

## Mounting the furnace

Take off the cover by loosening the two screws at the bottom. Pull the bottom away from the heater and lift it up off the tabs on top.

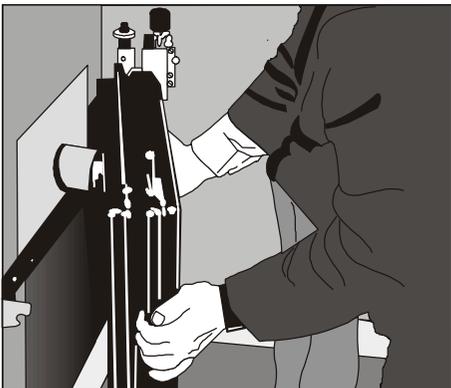


Figure 9

## Important: remove styrofoam inside front cover now.

Remove the small piece of wood from the rear of the heater and discard. Four small adhesive foam pads are included with the unit and can be found in the accessory bag. **Place the foam pads on the four raised "bumps" on the rear of the unit. These foam pads will protect the wall surfaces from damage.**

Hang the heater on the arms on the wall support bracket, taking extreme care to ensure that the small diameter vent pipe fits inside the smaller opening in the rear of the unit. (See Figure 9). The larger diameter vent pipe must then slide over the outside flange opening.

**Warning: the heater will not function properly if these connections are not tight and clean.** Secure the unit to the wall support bracket with the two screws provided.

Attach the **Lighting Instructions** to the back of the unit so that they may be read when necessary. These instructions are for current and future use. Make sure they remain accessible after the unit is installed.

## Connecting the gas supply

Connect the gas supply to the 3/8" (9.5 mm) pipe on the lower part of the right side of the heater by using standard connectors. Please refer to the cautionary remarks noted in the beginning of this manual.

**After connecting the gas supply to the gas control on the heater, the connections must be checked thoroughly for leaks.** With the shut-off valve turned ON, but the gas control knob on the heater OFF, apply liberal amounts of a soapy water solution to all of the piping joints. A gas leak will cause bubbles to form. Note any leaks in the piping system, then shut off the gas at the shut-off valve, or at the gas meter or propane/LP tank serving the building. Fix the leaking joint and re-test the joints as directed above.

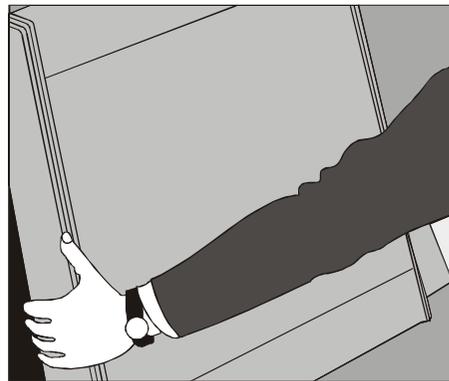


Figure 10

Once the supply is checked and does not leak, place the cover on the unit. See Figure 10. Be sure the foam packing has been removed. Secure the cover with the two nuts at the bottom of the unit which you had removed when unpacking.

# LIGHTING INSTRUCTIONS

## FOR YOUR SAFETY READ BEFORE LIGHTING

**WARNING: If you do not follow these instructions exactly, a fire or explosion may result causing property damage, personal injury or loss of life.**

- A. This appliance has a pilot which must be lighted by hand. When lighting the pilot, follow these instructions exactly.
- B. 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.

### WHAT TO DO IF YOU SMELL GAS

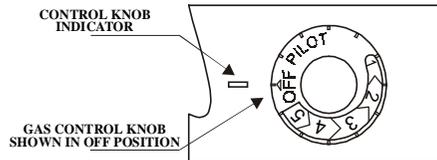
- Do not try to light any appliance.
- Do not touch any electrical switch; do not use any phone in your building.
- Immediately call your gas supplier from a neighbor's

phone. Follow the gas supplier's instructions.

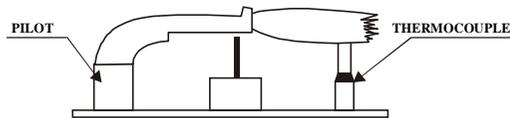
- If you cannot reach your gas supplier, call the fire department.
- C. Use only your hand to push in or turn the gas control knob. Never use tools. If the knob will not push in or turn by hand, don't try to repair it; call a qualified service technician. Force or attempted repair may result in a fire or explosion.
- D. Do not use this appliance if any part has been under water. Immediately call a qualified service technician to inspect the appliance and to replace any part of the control system and any gas control which has been under water.

## LIGHTING INSTRUCTIONS

1. STOP! Read the safety information above.
2. Set the thermostat to the lowest setting.
3. Open the control access panel on the top right side of the unit.
4. Turn the gas control knob clockwise ↻ to the OFF position.



5. Wait five (5) minutes to clear any gas. If you then smell gas, STOP! Follow "B" in the safety information above in this label. If you don't smell gas, go to the next step.
6. Locate the red pushbutton Piezo igniter directly behind the gas control knob.



7. Turn the gas control knob counter clockwise ↺ to the PILOT position. Depress the gas control knob and push in the Piezo igniter several times, until the pilot is lit. The pilot flame can be observed by looking down the inside of the heater jacket. A small reflector on the right hand side near

the bottom should allow you to see if the pilot is lit. Removal of the outer painted jacket of the heater will allow direct visual observation of the pilot and burner.

8. Continue to depress the gas control knob for at least 30 seconds or until the pilot remains lit. When you release the gas control knob, it should pop back up. Pilot should remain lit.
  - If the knob does not pop up when released, stop and immediately call your service technician or gas supplier.
  - If the pilot will not stay lit after several tries, turn the gas control knob to the OFF position and call your service technician or gas supplier.
9. Attention! Gas control knob has an INTERLOCK latching device. When the pilot is initially lit and the safety magnet is energized (pilot stays ON) the interlock latching device becomes operative. If the gas control is turned to the OFF position or gas flow to the appliance is shut off, the pilot cannot be relighted until the safety magnet is de-energized (approximately 60 seconds). There will be an audible "click" when the safety magnet in the gas control is de-energized. Pilot can now be relighted. Repeat steps 4 through 8.
10. Replace the front painted cover (if removed).
11. Turn the gas knob counter clockwise ↺ to the desired temperature setting.
12. Close the control access door.

## TO TURN OFF GAS TO APPLIANCE

1. Set the thermostat to lowest setting.
2. Open the control access panel on the top right side of the unit.
3. Turn the gas knob clockwise ↻ to the OFF position. Do not force.

4. Close the control access panel.

**WARNING:** After turning off wait 5 minutes before trying to relight.

# PILOT FLAME CHARACTERISTICS

The correct flame will be almost horizontal, blue and will extend past the thermocouple 1/4" (6 mm). The flame will surround the thermocouple just below the tip.

On propane (LP-gas) slight yellow might occur where the pilot flame and burner flame meet.

Natural gas pilots require adjusting when the inlet pressure is above 5" w.c. (1.25kPa). Turn adjustment screw clockwise to reduce flame.

Propane (LP-gas) will not require adjusting.

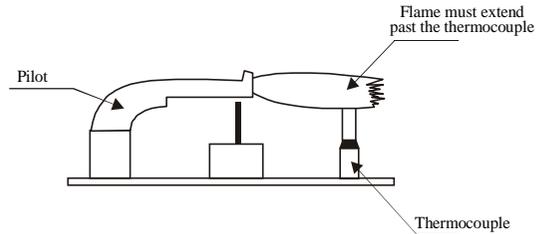


Figure 11

# MAIN BURNER FLAME CHARACTERISTICS

There will be a short blue inner flame with a much larger lighter blue secondary flame. The burner flame may have a yellow tip when hot. See the burner drawing showing the approximate heights of each part of the flame. Dust in the combustion air will produce an orange or red flame. Do not mistake the orange or red flame for an improper yellow flame. After use, cleaning may be required for the proper flame.

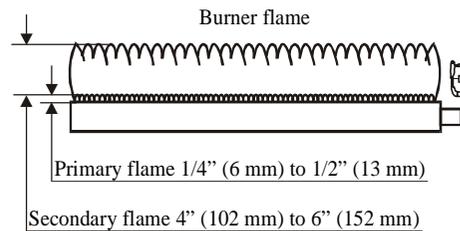


Figure 12

# MAINTENANCE

The appliance should be inspected and cleaned before using each year by a qualified service person.

**Warning:** the following instructions are designed to direct a qualified technician through the proper periodic maintenance and repair which may be required throughout the expected life of this unit. **NO attempt should be made by the homeowner to perform these functions.**

1. Remove the cover from the unit by removing the two nuts at the bottom of the unit.
2. The gas supply should be turned OFF at the shut-off valve in the supply piping leading to the appliance (if installed), or at the gas meter or propane/ LP tank. **The gas to the unit should be disconnected so the unit can be removed from the wall.**
3. Remove the two screws which hold the unit to the wall support plate and lift and pull the unit away from the wall.
4. Carefully examine the interior of the vent pipes, both large and small diameter. If you notice any blockage or obstruction, clean the pipes.
5. Look inside the openings of the rear of the unit and check for any foreign materials. Remove any objects which may block or obstruct the free flow of combustion and ventilation air. You will only be able to see a portion of the interior of the unit from this angle.
6. The main burner and pilot burner can be removed from the unit for cleaning by first loosening the compression fittings

that supply gas to both the main burner and pilot. Note: before removing either the pilot assembly or main burner assembly be sure to have replacement gaskets on hand. See Figure 13. After unscrewing the gas connection to the burner and removing the compression nuts, unscrew the thermocouple from the base of the pilot and remove it from the pilot assembly. Remove the four screws which hold the main burner/pilot plate in place, and withdraw the burner/pilot from the unit. Check the burner/pilot for dirt, lint, or a black powdery carbon deposit. If any is noted, brush it off completely using a soft bristled brush, or blow it

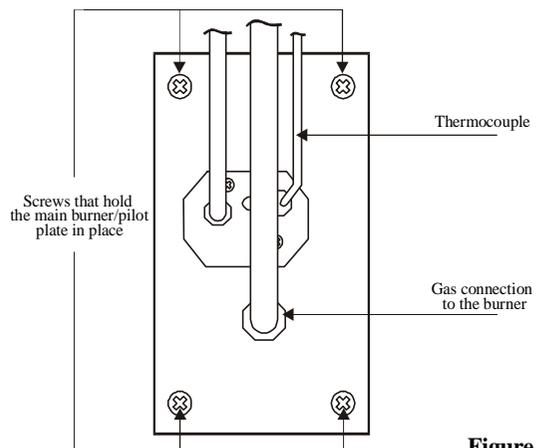


Figure 13

## MAINTENANCE (cont.)

- out. Do not attempt to pass anything through the pilot orifice. Next, check the main burner for dirt, lint or carbon deposits. Again, if any is noted, clean with a soft brush.
- Inspect the interior of the combustion chamber for dirt, lint or carbon deposits. If any are found, loosen them with a long handled brush and remove the residue from the heater with a vacuum cleaner.
  - In preparation for replacing the main burner/pilot, check the condition of the gasket on the mounting plate. If the gasket appears damaged or worn, replace **ONLY** with a gasket available from Empire Comfort Systems Inc., whose address is at the bottom of this page. Install the assembly in the heater and re-secure the assembly to the heater chassis with the four screws removed in step 6 above. **Note: verify that the left side of the main burner is mounted on its support bracket. The burner should be level.**
  - Reconnect the main burner and pilot gas lines which were disconnected in step 6 above. Reinstall the thermocouple in the pilot bracket, inserting it fully into chamber before tightening.
  - Replace the heater on the wall support bracket, taking extreme care to ensure that the small diameter vent pipe is firmly engaged with the vent outlet at the rear of the heater. The large diameter vent pipe will slide over the appropriate opening. Resecure the unit to the bracket with the two screws removed earlier.
  - Reconnect the gas supply piping and **REPEAT THE LEAK TEST PROCEDURE**. In addition, it will be necessary for you to check the gas connections inside the unit for leaks. After testing the gas connections to the unit, place the pilot burner into operation by following the instructions found in this manual or on the hanging tag behind the unit. Check all joints to the pilot gas line with a soapy water solution. Bubbles on any of the joints indicated a leak is present and must be repaired. Turn **OFF** the gas to the unit when performing any repairs to the gas piping system. After the pilot lines are checked, turn the main burner **ON** and again check all joints in the piping system for leaks with soapy water. Repair any joints which indicate a leak is present.
  - While the main burner is **ON**, check the pilot and burner flames to see that they are burning a clean blue color. See Figures 11 and 12 for an approximation of the correct flame pattern. If your unit is not burning cleanly, or if you are not sure, turn the unit **OFF** and contact the gas supplier or call Empire Comfort Systems Inc..
- Before completing your periodic maintenance checkout, ensure that the appliance area is clear and free from combustible materials, gasoline, and other flammable vapors or liquids. Also check to see that the flow of combustion and ventilation air around the vent cap on the outside of the structure is not obstructed.
- Note: verify proper operation after servicing.**

## HOW TO ORDER REPAIR PARTS

Parts can be ordered only through your **service person or dealer**. For best results, the service person or dealer should order parts through the distributor. Parts can be shipped directly to the **service person/dealer**.

All parts listed in the Parts List have a Part Number. When ordering parts, first obtain the Model Number from the name plate on your equipment. Then determine the Part Number (not the Index Number) and the Description of each part from the following appropriate illustration and list. Be sure to give all this information . . .

Furnace Model Number \_\_\_\_\_ Part Description \_\_\_\_\_

Furnace Serial Number \_\_\_\_\_ Part Number \_\_\_\_\_

Type of Gas (Propane or Natural) \_\_\_\_\_

Do not order bolts, screws, washers or nuts. They are standard hardware items and can be purchased at any local hardware store.

Shipments contingent upon strikes, fires and all causes beyond our control.

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**Empire Comfort Systems, Inc. Nine Eighteen Freeburg Ave. Belleville, IL 62222-0529**

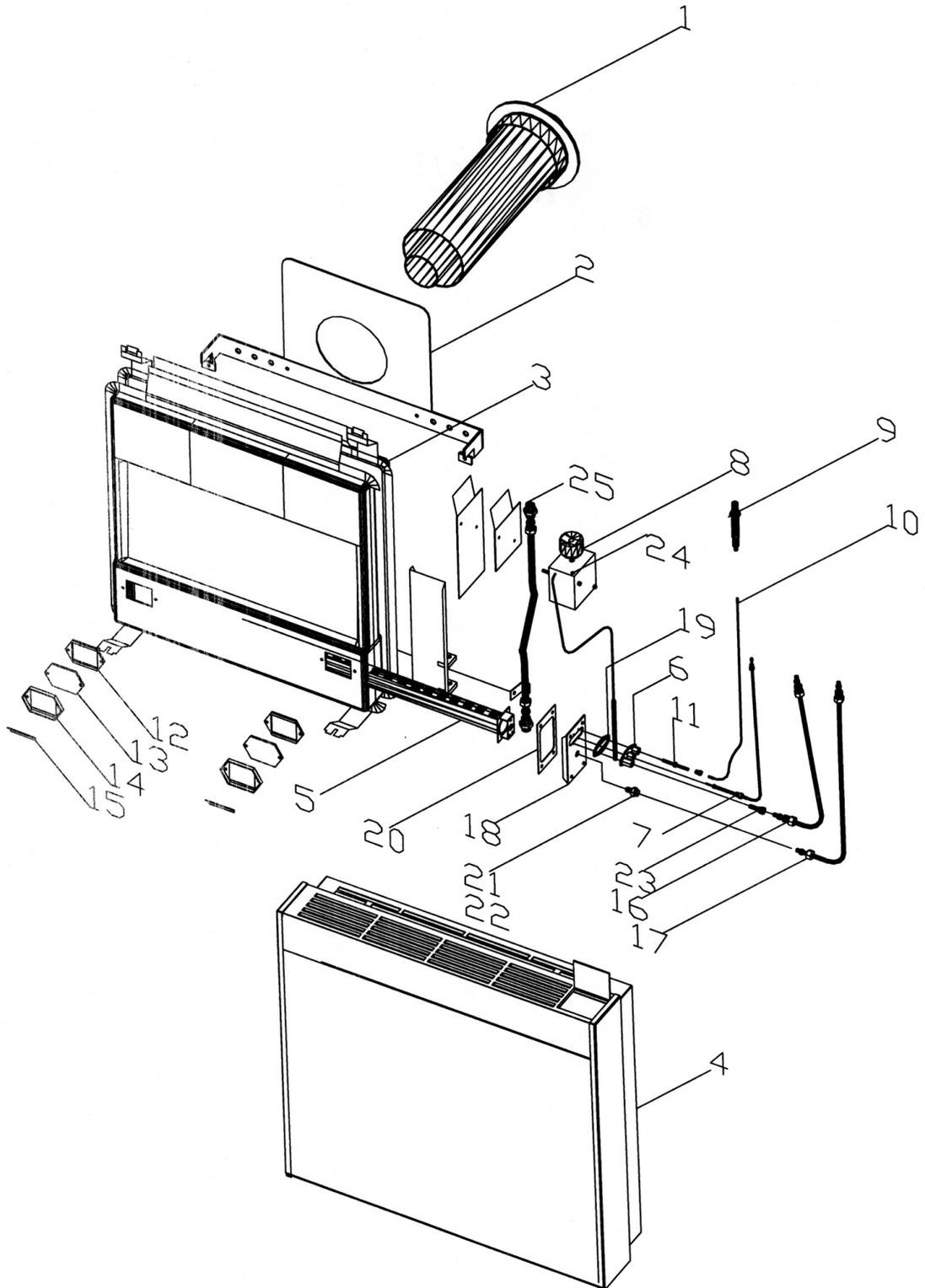
# PARTS LIST

**PLEASE NOTE:** When ordering parts, it is very important that part number and description of part coincide

**USE ONLY MANUFACTURER'S REPLACEMENT PARTS. USE OF ANY OTHER PARTS COULD CAUSE INJURY OR DEATH.**

No.	PART NAME	PART N° / MV 120	PART N° / MV 130	PART N° / MV 145
1a	Vent Assy. (6" to 12" / 152.4 to 304.8 mm)	SD43019400	SD43018500	SD43018400
1b	Vent Assy. (12" to 18" / 305 to 460 mm)	SD430194B0	SD430185B0	SD430184B0
2	Wall Support Plate	SD44221800	SD442202B0	SD44326100
3	Combustion Chamber	SK00000047	SK00000048	SK00000049
4	Cover	SK00000050	SK00000051	SK00000052
5	Main Burner Assembly	SD44108300	SD44107500	SD43107900
6	Pilot Burner	SD44105800	SD44105800	SD44105800
7	Thermocouple	SD44305500	SD44305500	SD44305500
8a	Gas Control Nat. Gas	SD44177000	SD44177000	SD44177000
8b	Gas Control LP Gas	SD44176900	SD44176900	SD44176900
9	Piezo Igniter	SD44175800	SD44175800	SD44175800
10	Piezo Wire	SD44120800	SD44120800	SD44120800
11	Pilot Igniter Electrode	SA00000263	SA00000263	SA00000263
12	Gasket for Viewing Window	SD44107002	SD44107002	SD44107002
13	Mica for Viewing Window	SD44107100	SD44107100	SD44107100
14	Frame for Viewing Window	SD44106900	SD44106900	SD44106900
15	Mirror for Viewing Window	SD44106801	SD44106801	SD44106801
16	Pilot Tubing	SK00000053	SK00000053	SK00000053
17	Main Burner Tubing	SK00000054	SK00000054	SK00000054
18	Burner Bracket	SD44106100	SD44106100	SD44106100
19	Pilot Burner Gasket	SD44158001	SD44158001	SD44158001
20	Main Burner Gasket	SD44158102	SD44158102	SD44158102
21a	Burner Orifice Natural	SD44125400	SD44125500	SD443215A0
21b	Burner Orifice LP Gas	SD44125700	SD44125200	SD443215B0
22a	Burner Orifices for 2000-4500 ft (610-1370 m) altitude Nat. Gas	SD443332A0	SD443332C0	SD443215C0
22b	Burner Orifices for 2000-4500 ft (610-1370 m) altitude LP. Gas	SD443332B0	SD443332D0	SD443215D0
23a	Pilot Burner Orifice Natural	SD44111300	SD44111300	SD44111300
23b	Pilot Burner Orifice LP Gas	SD44132400	SD44132400	SD44132400
24a	Minimum Rate Screw Nat.	SD44131900	SD44152900	SD44152900
24b	Minimum Rate Screw LPG	SD44131600	SD44153000	SD44153000
25	Gas Valve Connection Kit	SK00000055	SK00000055	SK00000055

# PARTS VIEW



# TROUBLESHOOTING

## SYMPTON 1: PILOT WILL NOT LIGHT

**A. Gas is not turned on, or air is trapped in the gas line:** the air trapped in the gas supply may be bled easily at the minimum rate screw. This is a brass screw located on top of the gas control situated at 1 o'clock when looking down the control knob. Unscrew the plug completely and pry out with a small screw driver. Turn the heater control knob to "pilot position" and press down until you smell the gas escaping at that screw hole. NOTE: ALL OPEN FLAMES IN AREA NEED TO BE EXTINGUISHED. After the odor is noted, replace brass screw and tighten snugly. Wait 5 minutes for gas to dissipate. Relight heater.

**B. Gas control, is not set to proper position:** in MV 120 and MV 130 units, it may be difficult to see the indicator for the pilot/gas position. Note that it is a marking, found on the lower side of the gas control, situated at 6 o'clock when looking down the control.

In MV 145 units, there's a slot marking in the front of the ring around the dial marking the reference position.

**C. No spark from piezo:** look through window for spark when lighting the pilot. If there is no spark, trace the insulated sparking wire to the electrode and be certain all connections are tight.

**D. Clogged pilot injector:** clean the pilot orifice. Natural gas orifices are large enough that you can usually clean them by blowing through them. The LP orifice is so small that the best is to replace it. Never try to enlarge the hole, or use a sharp hard object for cleaning.

**E. Gas regulator jammed due to high pressure:** reset the regulator.

**F. Broken or cracked piezo electrode or broken electrode wire:** replace it.

## SYMPTON 2: PILOT WILL NOT STAY LIT WHEN KNOB IS RELEASED

**A. Gas control knob not held down long enough:** allow at least 30 seconds. During initial lighting, or after long periods of inactivity, the presence of air in the gas supply pipe may ask for a longer hold.

**B. Pilot flame too weak:** a weak pilot indicates dirt or an insufficient gas supply. However, the pilot may be adjusted by turning the small brass screw on the left hand front top of the gas control top plate. Backing the screw out counterclockwise increases the pilot flame. The pilot flame should contact the thermocouple tip, but not excessively long. (See Lighting Instructions).

**C. Thermocouple not functioning:** the thermocouple is a standard 24 millivolt probe. Check its effectiveness by removing it from the heater and attach a probe (alligator clip) to the magnet contact bulb on the gas control end of the thermocouple. Place the other probe (alligator clip) to the cooper shield near the heat tip. Holding the tip in a flame

source, such as a candle flame, a good thermocouple should read 23-30 millivolts. If this is not the case, replace the thermocouple.

## SYMPTON 3: MAIN BURNER WON'T LIGHT

**A. Pilot is not lighted.**

**B. Thermostat turned too low or Gas control knob still on "pilot" position.**

**C. Gas supply is inadequate:** have gas person confirm gas pressures.

**D. Defective gas control valve:** replace it. (This is a very unlikely occurrence).

## SYMPTON 4: MAIN BURNER WON'T STAY LIT

**A. Temperature dial turned too low.**

**B. Vent pipes not cut to proper length:** (larger vent pipe not fitting snugly over outer flange). The inner vent pipe must be 2" (50.8 mm) longer than the outer vent pipe in order to maintain the necessary air supply for proper combustion. If the inner and outer pipes are close to the same length, air supply will not be adequate and the burners will not stay on. Flames lifting off of the burner are symptomatic of improper venting.

**C. Gas supply is inadequate.**

**D. Thermostat sensor bulb near accessory heat source:** if the thermostat sensor bulb at the bottom of the furnace is too near an electric baseboard, the appliance will sense that the room is warm enough and the burners will not come on.

**E. Outer vent cap is dirty or obstructed:** any dirt or debris which accumulates in or over the outer vent cap will interfere with the venting of the heater, and the burners will not function. The heater must be adequately vented for proper functioning.

## SYMPTON 5: ROOMS WILL NOT MAINTAIN TEMPERATURE

**A. Thermostat turned too low or Gas control knob still on "pilot" position.**

**B. Unit is too small to heat the space.**

**C. Gas supply is inadequate.**

**Note:** for each stated problem (1-5), the causes are stated in the order of likelihood of occurrence.