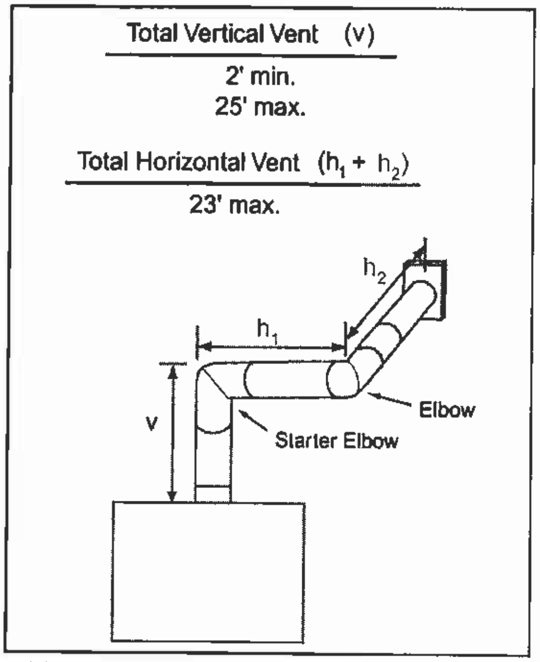


Figure 27 - Vent Lengths with Two Elbows

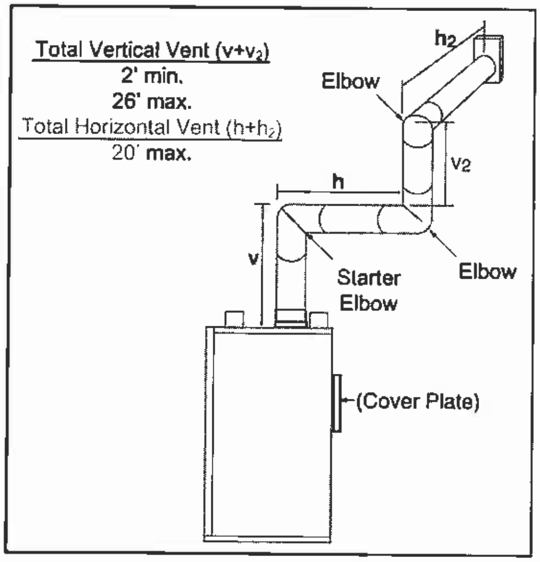


Figure 28 - Vent Lengths with Three Elbows

WARNING!
The horizontal run of vent must have a 1/4" rise for every 1 ft. of run towards the termination. Never allow the vent to run downward. This could cause high temperatures and may create a fire hazard.

c. Vent Lengths for Rear Vent

Various venting configurations are shown in Figures 29-32.

Note: Starter elbows cannot be used in any rear vented configuration.

1) No Elbows

The maximum horizontal run, with no vertical sections of vent, is 18 inches from the back of the appliance to the base of the cap. See Figure 29.

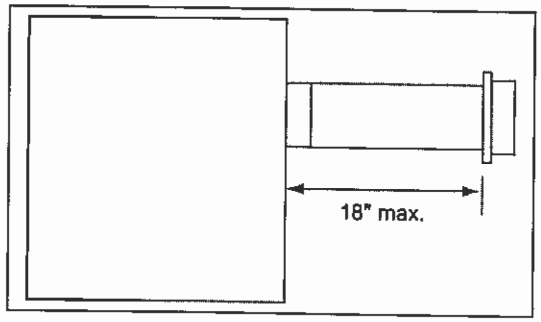


Figure 29 - No Elbows

2) 45° Elbow

For corner installations with horizontal venting, a maximum of one 45 ° elbow may be used. The maximum horizontal run following the elbow is 18" to the base of the cap. See Figure 30.

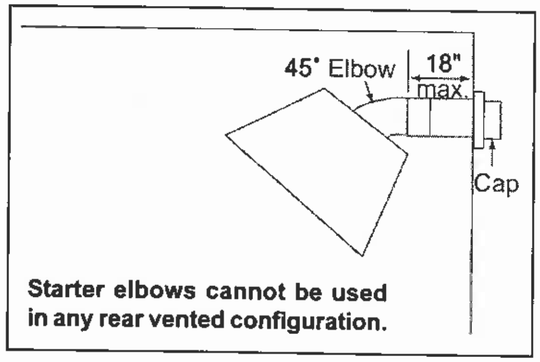
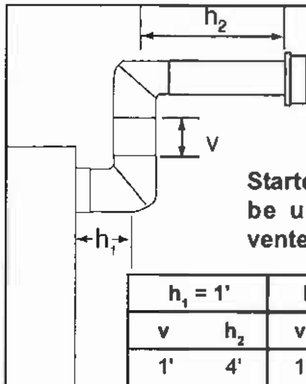


Figure 30 - 45° Elbow

3) **Two Elbows**

Elbows used on rear-vented configurations should be either a 90° or a 45° elbow. **Starter elbows CANNOT be used in any rear-vented configuration**. Figure 31 shows various venting configurations using two elbows to terminate horizontally.



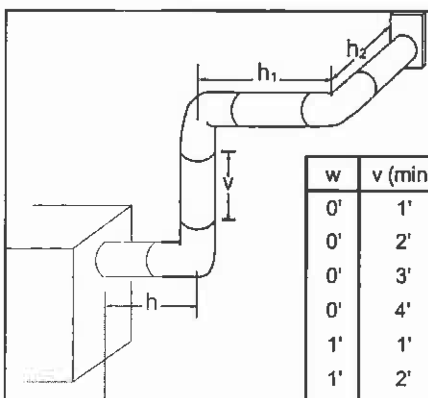
Starter elbows cannot be used in any rear vented configuration.

h_1 = 1'		h_1 = 2'		h_1 = 3'	
v	h_2	v	h_2	v	h_2
1'	4'	1'	2'	1'	4'
2'	6'	2'	4'	2'	5'
3'	9'	3'	6'	3'	6'
4'	11'	4'	8'	4'	8'
20' max	11' max	20' max	8' max	20' max	8' max

Figure 31 - Two Elbows

4) **Three Elbows**

Elbows used on rear-vented configurations should be either a 90° or a 45° elbow. **Starter elbows CANNOT be used in any rear-vented configuration**. Figure 32 shows various venting configurations using three elbows to terminate horizontally.



w	v (min)	$h_1 + h_2$
0'	1'	5'
0'	2'	7'
0'	3'	7'
0'	4'	8' max
1'	1'	3'
1'	2'	4'
1'	3'	4'
1'	4'	6'
2'	1'	2'
2'	2'	3'
2'	3'	3'
2'	4'	4'

Starter elbows cannot be used in any rear vented configuration.

Figure 32 - Three Elbows

d. **Installing the Interior Wall Shield**

Whenever a combustible wall is penetrated, the hole must be framed (as shown in Figure 33) to receive an interior wall shield (Figure 34). This shield maintains minimum clearances and restricts cold air infiltration.

The termination cap height must meet all local and national codes and not be easily blocked or obstructed.

If the wall being penetrated is of noncombustible materials, a 9" diameter hole is acceptable.

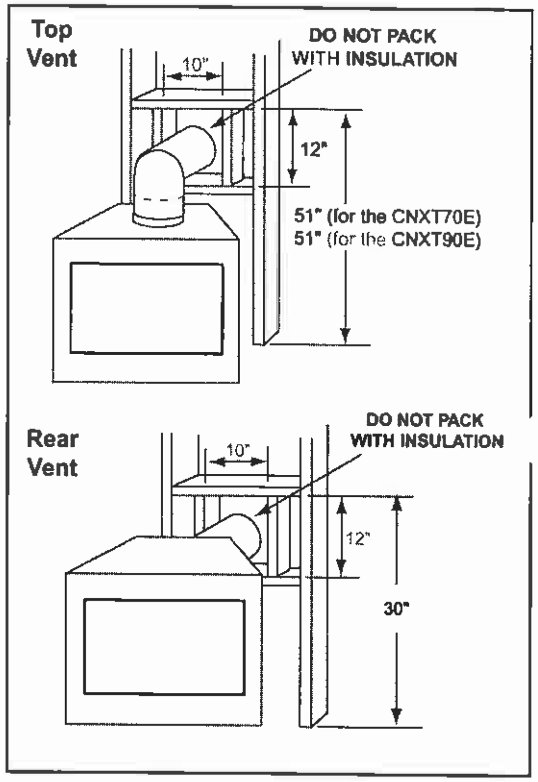


Figure 33 - Exterior Wall Hole

Secure the shield to the framing as shown in Figure 33.

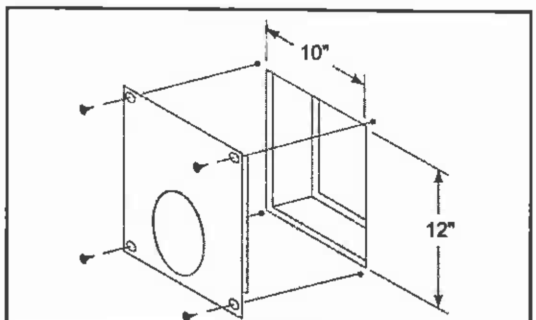


Figure 34 - Interior Wall Shield

Note: Exterior wall thickness must be a minimum of 4" to a maximum of 17½".

The last section of vent may require cutting, depending upon the wall thickness and appliance location. The cap should overlap the vent sections by at least 1½". See Figure 35.

Note: If cutting is necessary, you must use VP12MI and VP24MI pipe.

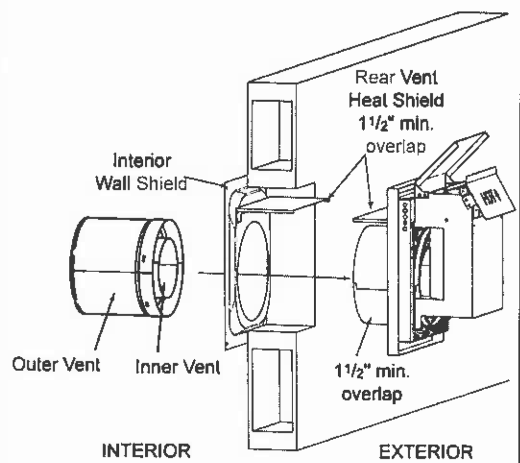


Figure 35 - Venting Through the Wall

e. Installing the Rear Vent Heat Shield

For rear vented appliances a heat shield MUST be placed 1 inch above the top of the vent between the wall shield and the termination cap. There are two sections of the heat shield. One section attaches to the wall shield with two screws. The remaining section is attached to the cap in the same manner. The sections of the heat shield will overlap to match the wall thickness (depth). The small leg on the shield should rest on the top of the vent to properly space it from the pipe section. See Figure 36. This heat shield is not necessary on top vented appliances.

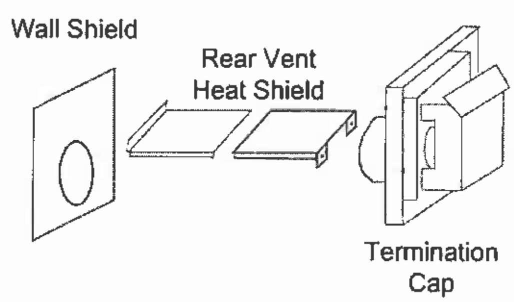


Figure 36 - Rear Vent Heat Shield

WARNING - RISK OF FIRE!
Be sure there won't be any future obstructions from trees, bushes, snow drifts, etc.

WARNING - RISK OF FIRE!
Always maintain minimum air space clearances or greater around the appliance and vent system.

f. Termination

Vent termination must not be recessed in the wall. Siding may be brought to the edge of the cap base.

Install the cap as shown in Figure 35. Cap pipe sections should overlap the vent pipe by 1½ inches. Caulk outside edges of cap.

Local codes may require the installation of a cap shield which prevents anything or anyone from touching the hot cap.

Figure 22, page 11 illustrates cap locations prescribed by current Z223.1 and CAN/CGA-B149 Installation Codes.

CAUTION:
A vinyl soffit shield (VSS2) should be installed if a cap is within 30" of a vinyl soffit.

2. Vertical Termination

a. Top and Rear Vent Clearances

See Figure 37 for clearance information.

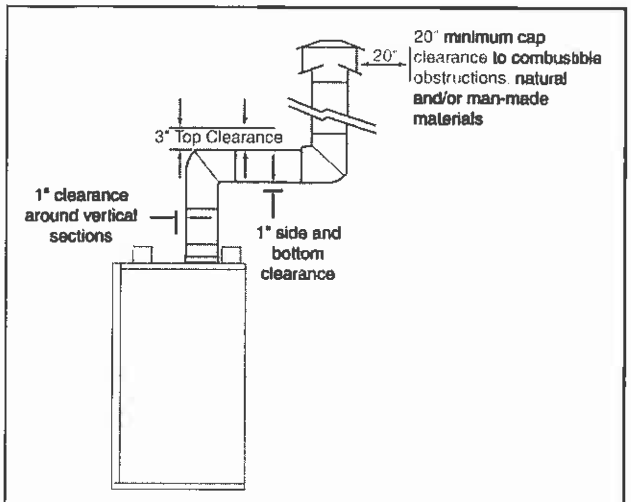


Figure 37
Vertical Termination Clearances (top vent shown)

b. Top Vent Lengths

Various venting configurations are shown in Figures 38 and 39 from which maximum vent runs can be determined.

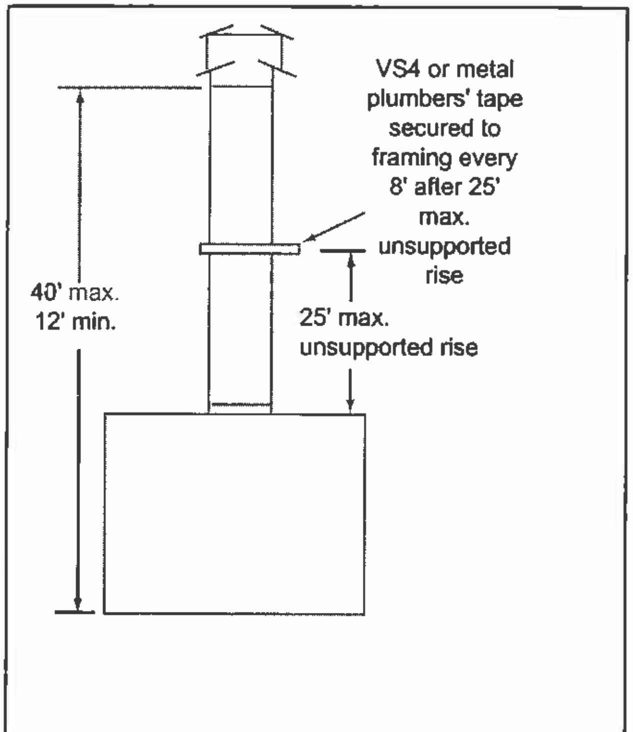
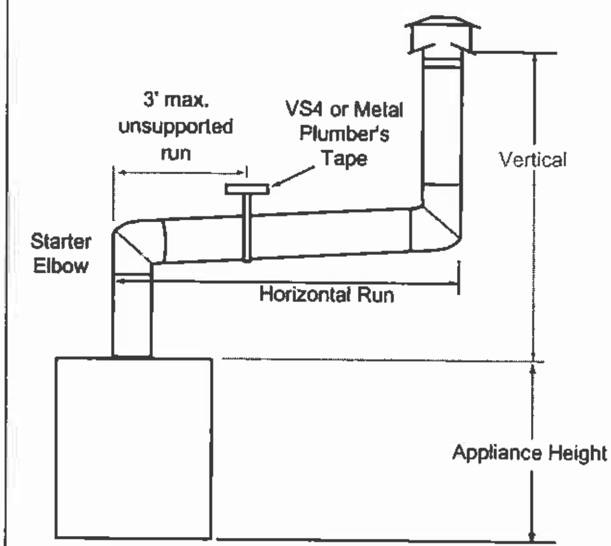


Figure 38
Vertical Termination Vent Lengths



Note: Maximum horizontal run is 100% of vertical. Horizontal run cannot exceed 26'.

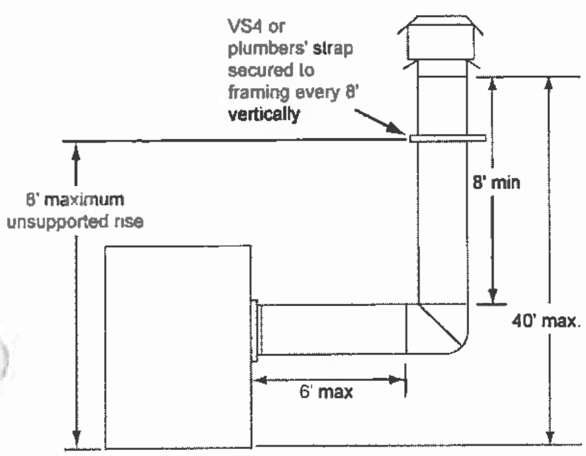
Figure 39
Maximum Horizontal Vent Lengths

Note: Horizontal runs will require the use of one vent support (or metal plumber's strap) for every 3' of vent.

WARNING!
The horizontal run of vent must have a 1/4" rise for every 1 ft. of run towards the termination. Never allow the vent to run downward. This could cause high temperatures and may create a fire hazard.

c. **Rear Vent Lengths**

Attach a rear vent kit straight section or an elbow (depending upon your specific installation) to the appliance. See Figure 40. **Starter elbows CANNOT be used in any rear vented configuration.** A maximum of three elbows are allowed in the vent system. Use only pipe listed with this appliance. **ALWAYS MAINTAIN MINIMUM AIR SPACE CLEARANCES OR GREATER AROUND THE VENT SYSTEM.** Do not pack air spaces with insulation or other material.



Starter elbows cannot be used in any rear vented configuration.

Figure 40
Rear Vent Length Allowances for Vertical Termination Only

> **CAUTION:**
> **Provisions shall be made to provide adequate combustion and ventilation air.**

> **WARNING - RISK OF FIRE!**
> Always maintain minimum clearances or greater around the vent system. Do not pack air spaces with insulation or other material.

d. **Firestop Spacer/Vent Installation**

Frame an opening and install a firestop spacer whenever the vent penetrates a ceiling/floor area, as shown in Figure 41. Frame the opening with the same sized lumber as used in the ceiling/floor joists. Unless the flue is offset, the hole should be directly above the appliance. **DO NOT** pack insulation around the vent.

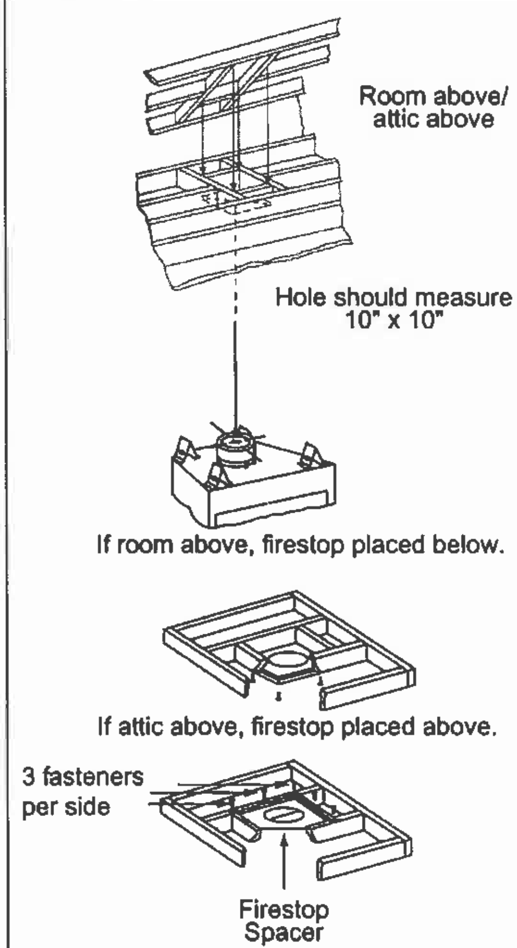


Figure 41
Installing the Firestop Spacer

e. **Chase/Termination Installation**

Figures 42 and 43 and Table 1 specify minimum vent heights for various pitched roofs.

These vent heights are necessary for safety and do not ensure draft-free operation. Trees, buildings, adjoining roof lines, adverse conditions, etc. may create a need for a taller vent should down drafting occur.

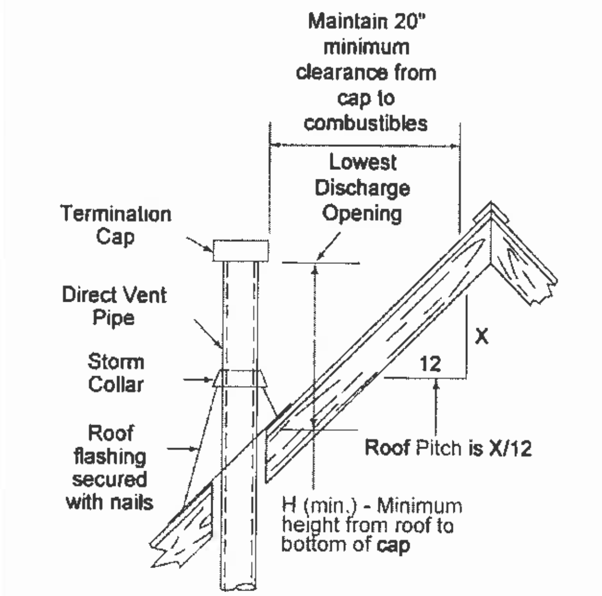
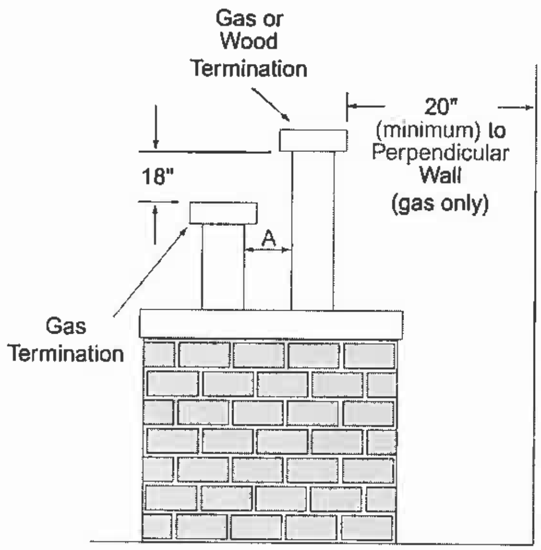


Figure 42 - Vent Height for Vertical Termination



	Gas Termination	Wood Termination
A	6"	20"

Figure 43 - Multiple Vertical Terminations

Roof Pitch	H (Min.) Ft.
Flat to 6/12	1.0
6/12 to 7/12	1.25
Over 7/12 to 8/12	1.5
Over 8/12 to 9/12	2.0
Over 9/12 to 10/12	2.5
Over 10/12 to 11/12	3.25
Over 11/12 to 12/12	4.0
Over 12/12 to 14/12	5.0
Over 14/12 to 16/12	6.0
Over 16/12 to 18/12	7.0
Over 18/12 to 20/12	7.5
Over 20/12 to 21/12	8.0

Table 1 - Vent Height

3. Assembling the Vent Sections

a. **Attaching the Venting to the Appliance**

To attach the first VP section to the appliance collars, simply slide the flared end of the inner vent of the VP section over the inner collar on the appliance. At the same time, insert the outer vent into the outer collar on the appliance. Push the vent section into the appliance collar until all the lances have snapped in place. Tug slightly on the vent to confirm it has completely locked into place.

b. **Assembling Vent Sections**

1) Start the flared inner flue of section "A" over the inner flue of section "B".

2) Insert the outer flue of section "A" into the outer flue of section "B". See Figure 44. Once both inner and outer flues are started, press section "A" into section "B" firmly until all lances have snapped into place. Tug slightly on section "A" to confirm it has completely locked into place. See Figure 45.

Note: Squeezing the pipe slightly to fit may be necessary.

Make sure that the seams are not aligned to prevent unintentional disconnection.

To ensure proper operation, verify all venting and the termination are unobstructed.

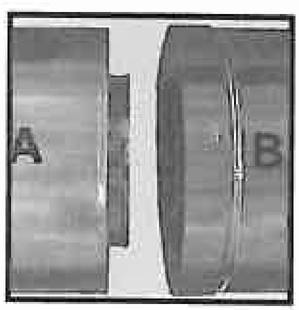


Figure 44

Figure 45

c. **Assembling Minimum Installations (MI) Sections**

MI sections are non-unitized so that they can be cut to a certain length. To use these sections, they must be cut to length from the non-expanded end. See Figure 46. They can then be attached by first connecting the expanded end of the MI inner vent with the inner vent from the adjacent vent section and securing with three screws. The expanded portion of the MI inner vent must overlap completely with the untreated end of the adjacent vent section. The outer vent can then be inserted into the adjacent outer vent expanded end and attached to the next vent section with three screws. The other end of the MI vent section can then be attached by fitting a snap lock section to it and snapping it together as normal.

d. **Assembling Slip Sections**

Slip sections should be snapped into the first mating piece, then expanded to their desired length, making sure that a 1.5" overlap is maintained between the two sections of the slip section. The two sections of the slip section then need to be secured by driving two screws through the overlapping portions of the outer vent. See Figure 47. This will secure the slip section to the desired length and prevent it from separating. The slip section can then be attached to the next section of vent.

e. **Disassembling Vent Sections (only if necessary)**

To disassemble any two pieces of pipe, rotate one section so that the seams on both pipe sections are aligned as shown in Figure 48. They can then be carefully pulled apart.

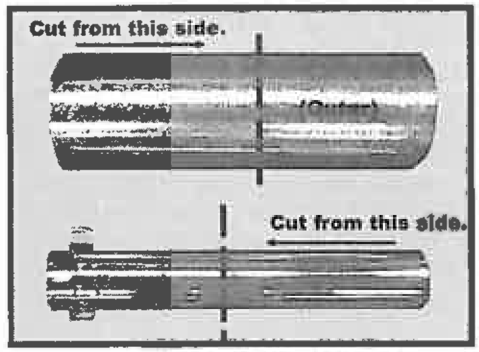


Figure 46

Figure 47

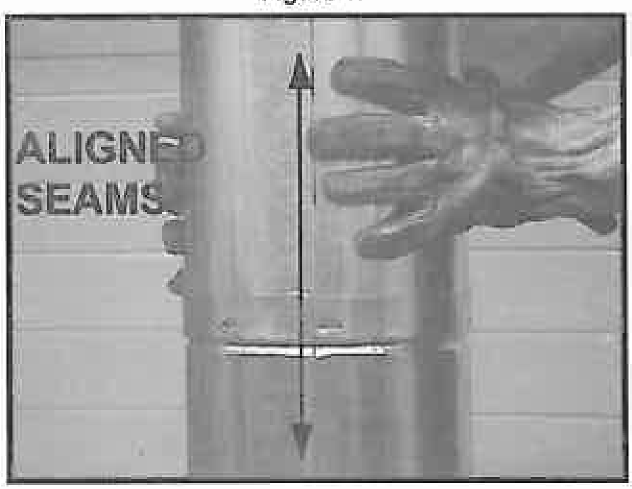


Figure 48

G. UTILITIES

1. High Altitude Installation

For U.S. installation, appliances are tested and approved for elevations from 0-2000 feet. When installing this appliance at an elevation above 2000 feet, National Fuel Gas Codes require a decrease of the input rating by changing the existing burner orifice to a smaller size. Input should be reduced 4% for each 1000 feet above sea level. Check with the local gas utility for proper orifice size identification. The correct orifice is available from your Heatilator distributor.

For Canada, appliances are certified for elevations from 0-4500 feet. When installing this appliance at an elevation between 0-4500 feet in Canada, the input rating does not need to be reduced. When installing this appliance at an elevation above 4500 feet in Canada, check with local authorities.

2. Gas Line Connection

The appliance is provided with a stainless steel flexible connector and a listed (and Commonwealth of Massachusetts approved) tee-handle manual shutoff valve. See Figure 49. The incoming gas line should be piped into the valve compartment and connected to the 1/2" FIP connection provided on the manual shutoff valve. See Figure 50 to connect the gas line. Optional: Seal around gas line to prevent cold air leakage.

All connections must be tightened and checked for leaks with a soap and water solution or a leak detector.

Bleed the gas line to extract any air that may have been trapped inside the pipe.

Note: Have the gas supply line installed in accordance with building codes by a qualified installer approved and/or licensed as required by the locality. In the Commonwealth of Massachusetts, installation must be performed by a licensed plumber or gas fitter.

Note: This 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 psi (3.5 kPa). 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 psi (3.5 kPa).

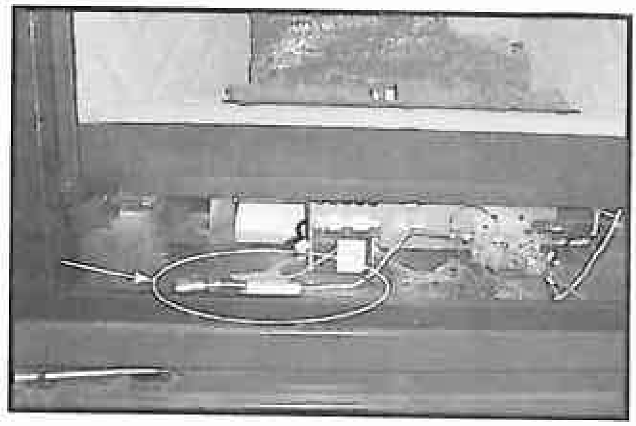
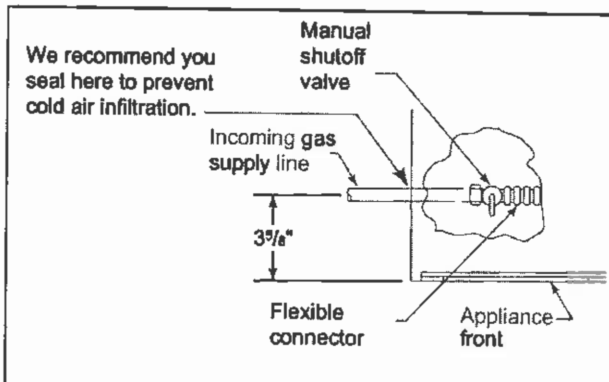


Figure 49
Flex Connector & Manual Shutoff Valve



OPTIONAL: Seal around the gas line to prevent cold air leakage.

Figure 50 - Gas Line

3. Gas Pressure

A pressure tap is included on the front face of the intermittent pilot ignition gas control valve.

Table 2 shows optimum gas pressure information. Consult your local gas company for assistance in determining the proper orifice for your altitude or refer to ANSI Z223.1-latest edition, Appendix F.

Table 3 shows orifice sizes and BTU ratings.

4. Field Fuel Conversion

Natural or propane gas conversions necessary to meet the application need to be made by a qualified technician using Hearth Technologies Inc. specified and approved parts.

In the event your appliance must be converted to use propane, you must use a DCKVPNXT Conversion Kit. To be converted to use natural gas, you must use a DCKVNNXT Conversion Kit.

⚠ WARNING

THIS VALVE HAS BEEN PRESET AT THE FACTORY. ALTERING SETTINGS MAY RESULT IN FIRE HAZARD OR BODILY INJURY.

CALIBER NXT 70/90	
Inlet Gas Supply Pressure (N.G.)	4.5 (min.) - 7.0 (max.) in w.c.
Optimal Manifold Pressure (N.G.)	3.5 in. w.c.
Inlet Gas Supply Pressure (L.P.)	11.0 (min.) - 14.0 (max.) in. w.c.
Optimum Manifold Pressure (L.P.)	10 in. w.c.

Table 2
Gas Information for Intermittent Pilot Ignition Appliances

CALIBER NXT	70	90
Input Rate (N.G.)	40,000 BTU/hr.	45,000 BTU/hr.
Input Rate (L.P.)	37,500 BTU/hr.	40,000 BTU/hr.
Orifice Size (N.G.) Front	.059 in./1.49 mm	.067 in./1.70 mm
Orifice Size (N.G.) Back	.110 in./2.79 mm	.110/2.79 mm
Orifice Size (L.P.) Front	.035 in./.89 mm	.035/.89mm
Orifice Size (L.P.) Back	.063 in./1.60 mm	.067 in./1.70 mm

Table 3
Gas Information for Intermittent Pilot Ignition Appliances

5. Wiring - Intermittent Pilot Ignition (IPI)

a. **Appliance Requirements:** This appliance requires a 110V AC supply to the appliance junction box for operation. A wiring diagram is shown in Figure 52.

This appliance is equipped with an intermittent pilot control valve which operates on a 3 volt system. See ignition wiring diagram, Figure 51.

The appliance is supplied with a battery pack and a 3 volt AC transformer, which requires the installation of the supplied junction box. It is highly recommended that the junction box be installed at this time to avoid reconstruction. The battery pack requires two D cell batteries (not included). Batteries cannot be placed in the battery pack while using the 3 volt AC transformer. Conversely, the transformer must be unplugged if the battery pack is used.

b. **Optional Accessories Requirements:** Wiring for optional accessories should be done now to avoid reconstruction.

Note: This appliance must be electrically wired and grounded in accordance with local codes or, in the absence of local codes, with National Electric Code ANSI/NFPA 70-latest edition or the Canadian Electric Code, CSA C22.1

Note: This appliance must be electrically wired and grounded in accordance with local codes, or in the absence of local codes, with National Electric Code ANSI/NFPA 70-latest edition or the Canadian Electric Code, CSA C221.1.

CAUTION:

Battery polarity must be correct or control module damage will occur.

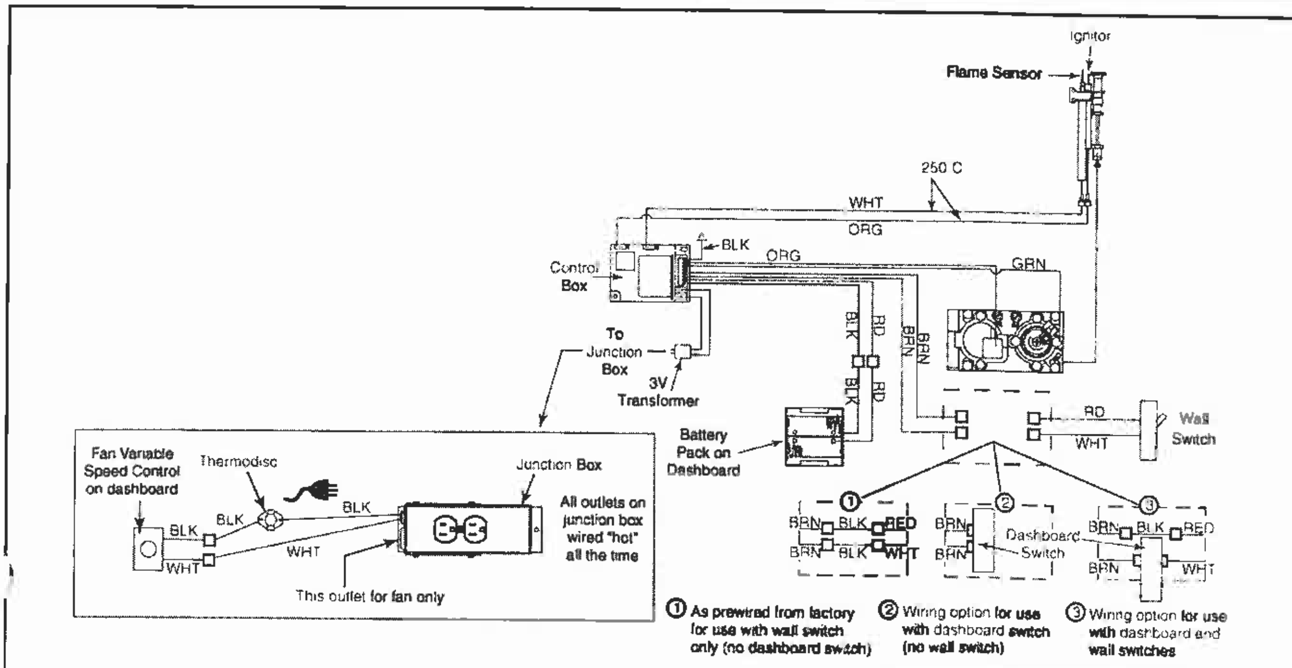


Figure 51 - Intermittent Pilot Ignition Wiring Diagram

c. **Wall Switch Wiring**

This appliance is pre-wired from the factory for use with a wall switch only.

d. **Dashboard Switch Wiring**

1) Find the two brown wires from the control box.
2) Disconnect these two brown wires from the two black jumper wires.
3) Connect the two brown wires to the male connectors on the back of the dashboard switch.

See Figure 51, #2 detail.

e. **Wall Switch and Dashboard Switch Wiring**

This appliance can be wired to run through both switches.

1) Find one of the black jumper wires that connects one brown wire from the control box and to one side of the wall switch wire.
2) Disconnect this black jumper wire from both ends and discard.
3) Connect the free end of the brown control box wire to one of the male connectors on the back of the dashboard switch.
4) Connect the free end of the wall switch wire to the other male connector on back of the dashboard switch.

See Figure 51, #3 detail.

f. **Fan Variable Speed Control (located on dashboard)**

To connect the variable speed control into the fan circuit:

1) Find the black wire from the thermodisc and connect to the black wire from the variable speed control.
2) Connect the white wire from the junction box to the white wire from the variable speed control.

Note: The fan will not operate without the variable speed control wired.

Note: If you wire the appliance to use both switches, both switches have to be ON for the appliance to run, although you will be able to shut the appliance off with either switch.

6. Junction Box Installation

a. Remove the junction box assembly from the valve compartment.

b. If the box is being wired from the OUTSIDE of the appliance;

1) Loosen two screws on the Romex connector, feed the necessary length of wire through the connector and tighten the screws.
2) Make all necessary wire connections to the receptacle and assemble the receptacle and cover to the junction box.
3) Attach the junction box assembly to the outside of the appliance with the two screws provided.

c. If the box is being wired from the INSIDE of the appliance;

1) Pull the electrical wires from outside the appliance through this opening into the valve compartment.
2) Loosen the two screws on the Romex connector, feed the necessary length of wire through the connector and tighten the screws.
3) Make all necessary wire connections to the receptacle and assemble the receptacle and cover to the junction box.
4) Attach the junction box assembly to the inside of the appliance with the two screws provided.

d. If the box is not to be wired at the time of appliance installation, assemble the receptacle and cover to the box and install on the inside of the appliance.

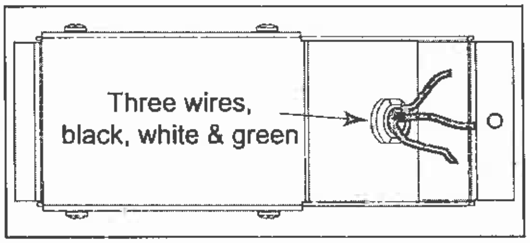


Figure 52 - Junction Box Detail