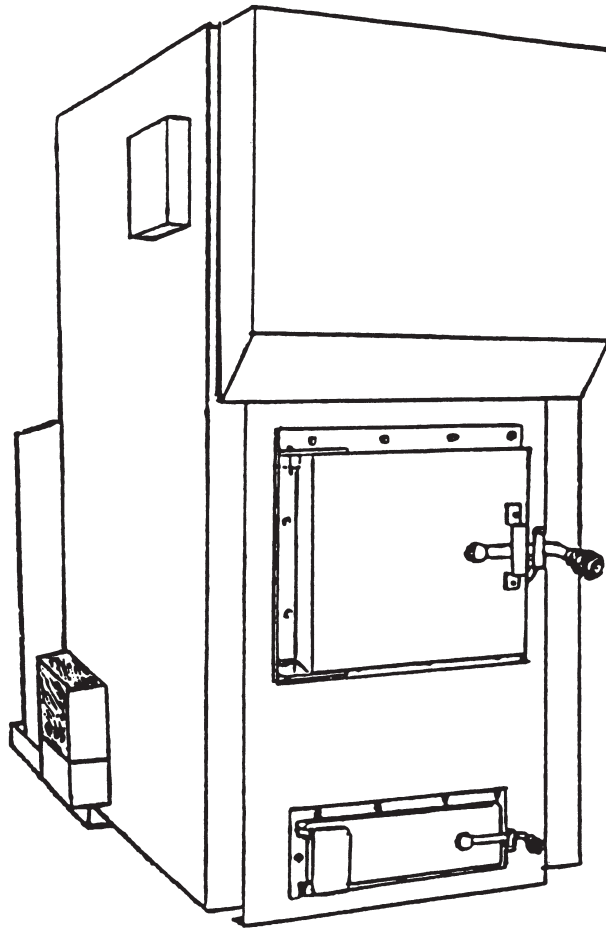


# OWNER'S & INSTALLATION MANUAL

**KUUMA**<sup>TM</sup> Vapor-Fire  
MODEL 100



**Lamppa Manufacturing & Distributing Co., Inc.**

BOX 422 • TOWER, MN 55790 • USA  
Tel (218) 753-2330 • [www.lamppakuuma.com](http://www.lamppakuuma.com)

## CAUTION:

READ ALL INSTRUCTIONS AND RULES FOR SAFE OPERATION CAREFULLY BEFORE STARTING  
THE INSTALLATION. FOLLOW ALL STATE AND LOCAL CODES AND ORDINANCES.

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## INTRODUCTION

Your Vapor-Fire Model 100 by Lamppa Manufacturing and Distributing Co., Inc., is a highly-sophisticated, electronically-controlled, solid fuel furnace utilizing the latest space-age technology. If installed and operated properly it should give you years of satisfying heat. Please read all of the instructions before installing and operating your new Vapor-Fire Model 100.

We ask that you contact your sales person and arrange for a professional installation.

**Installation must be done by a qualified installer.**

## LIMITED WARRANTY

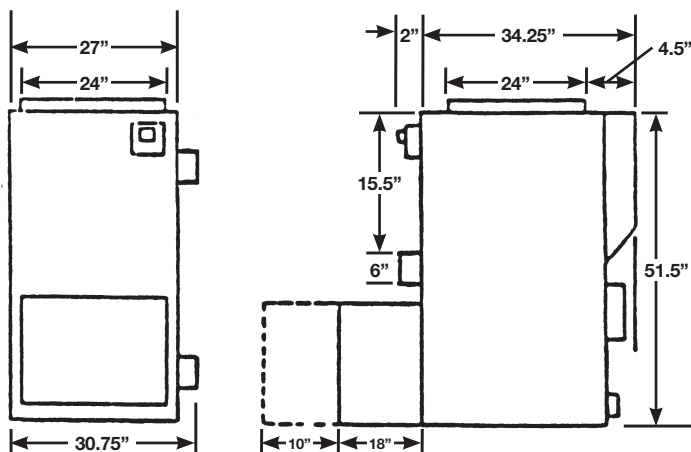
Your basic Vapor-Fire Model 100 is warranted for twenty-five (25) years from the date of purchase by Lamppa Manufacturing and Distributing Co., Inc., if it is installed and maintained according to the instructions provided by the manufacturer.

Under this warranty the manufacturer will repair defects in workmanship and replace defective parts free of charge to the customer. Any repairs that might require welding, burning, patching, etc., that is normally done in the manufacturer's plant, the customer shall ship the furnace, freight prepaid, to the plant at no cost to Lamppa Manufacturing and Distributing Co., Inc.

This warranty does not apply to any heat shields, brick holders, or parts, such as seals, latches, hinges, other moving parts that wear out under normal usage.

Under this warranty, all electrical components are covered for a period of 90 days from date of purchase if installed according to the manufacturer's instructions. The customer shall provide to the manufacturer, proof of purchase. Any repairs or replacement of components shall have a prior agreement between the customer and the manufacturer, before any such action is undertaken.

## SPECIFICATIONS



Dimensions .....	51 1/2 H x 27 W x 52 1/4 D
Flue Size .....	6" Diameter
Heat Outlet Size .....	24" x 24"
Fire Door Opening .....	12" W x 12" H
Control Type .....	Electronic
Ash Drawer Size .....	19" L x 10" W x 13" D
Combustion Chamber .....	23" L x 15 1/2" W x 20" H
Maximum Wood Length .....	22"
Combustion Chamber Lining .....	Brick Liner and Cast Iron
Fan Limit Control .....	Honeywell L 4064J-1008
Fan Low Limit .....	White Rogers 3F05-1
Fan Relay .....	Honeywell R8239A 1052
Electronic Draft Control .....	Vapor Fire Model 100/200
Draft Requirement .....	.04 - .06" W.C.
Filter .....	14" x 24" x 1" (2)
Power Req'd .....	15 amps, 120 volt, 60 Hz No. 14 AWG wire

### Clearance to Combustible

Side .....	6"
Front .....	48"
From the Flue Pipe .....	18"

Weight .....	695 pounds
Fuel Type .....	Wood only
Chimney Requirement .....	6" Class "A"

Figure 1

# INSTALLATION INSTRUCTIONS

1. Read thoroughly all of the installation and operation instructions before attempting installation.
2. If your stove doesn't have any bricks, install the bricks as shown in figure 34 (also see figure 18, page 12).
3. The unit must be set on a non-combustible surface, such as brick, ceramic tile, stone, or concrete and be at least 1 inch in thickness and 18 inches larger than the dimensions of the base as stated in the specifications, figure 1. The non-combustible floor protection must extend at least **16 inches in front of the unit**.
4. Install the blower assembly to the back of the unit as shown in figure 16. See figure 3 for typical hot air hookup.
5. Use 6 inch stove pipe to connect the smoke outlet in the back of the stove to **AN APPROVED CLASS A CHIMNEY**. Install only ONE connection to one flue. Make sure you use at least three metal screws at each joint connection, refer to figure 9.
6. Install a barometric draft control (field control 6" RC/BT) as described and illustrated on page 7 and 9, also see figures 9, 10 & 11.
7. **WE SUGGEST THAT A LICENSED ELECTRICIAN BE HIRED TO DO ALL YOUR ELECTRICAL CONNECTIONS.** See wiring diagram, figure 23, page 14, also see figure 2 page 5.

## OPERATION GUIDELINES

### STARTING A FIRE IN A COLD FIRE CHAMBER WITHOUT ANY HOT COALS

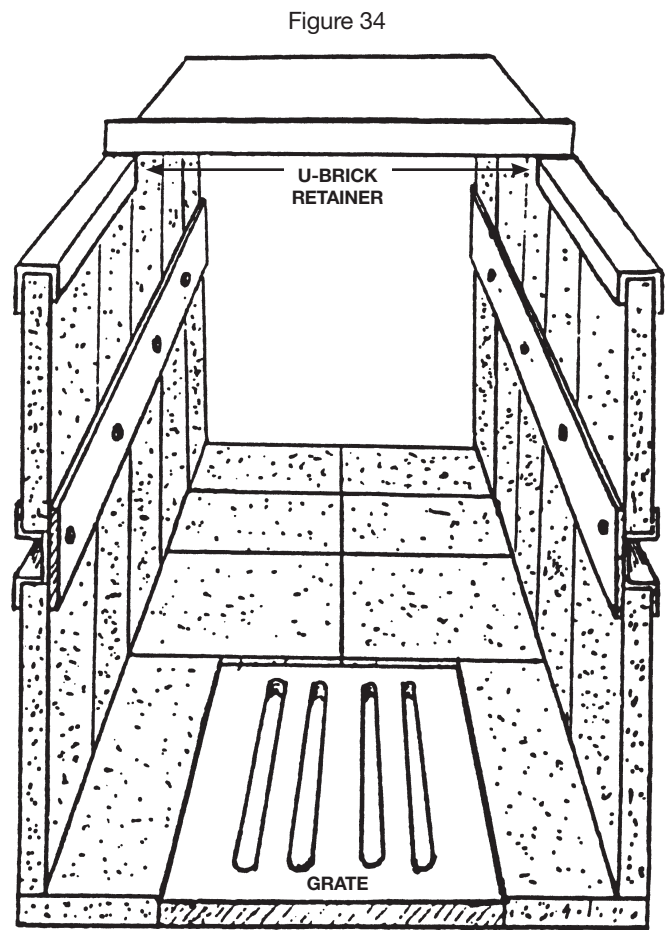
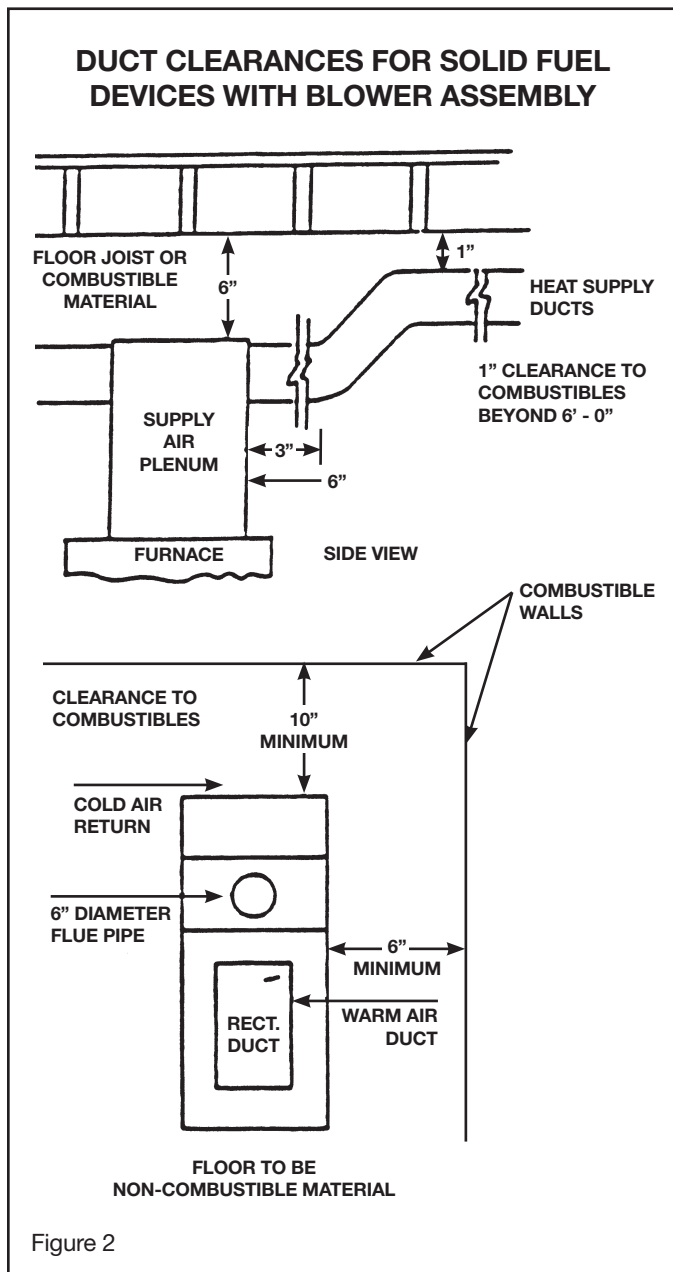
1. Open fire door.
  2. Scrape the ashes through the grate.
  3. Place a moderate amount of paper and kindling on the FRONT half of the fire chamber floor.
  4. Place your logs on top of the paper and kindling, making sure that front face of the logs are kept 1 inch away from the front inside face of the fire chamber, also make sure that the primary air openings as shown in figure 18 are kept open. (page 12)
  5. Ignite the paper.\*\*
  6. Open ash pan door approximately 1/4" until automatic draft damper opens.
  7. Momentarily hold the fire door open, approximately one-half inch, this will assist in igniting the kindling and helps to create the initial draft.
  8. Close the fire door and ash pan door tight – the electronic control automatically monitors the fire.
- \*\* Open ash pan door momentarily, when draft control is activated – **CLOSE ASH PAN DOOR.**

For equipment of this type, National Fire Protection Agency (NFPA) Standard No. 90B specifies the minimum standard clearances to combustible surfaces as summarized below:

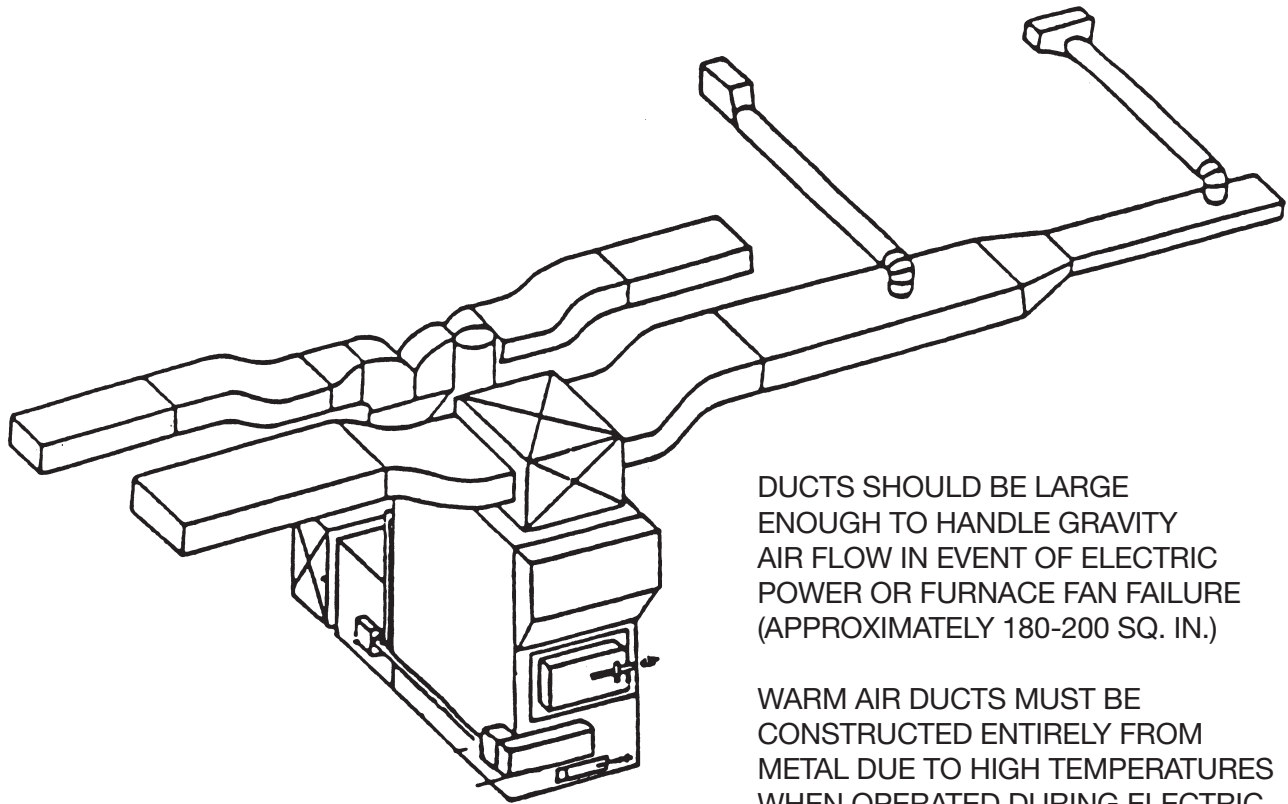
Above Top of Plenum .....	6"
From the Front .....	48"
From Sides and Back .....	6"
From Flue Pipe .....	18"
From Back .....	10"

From Horizontal Warm Air Duct:	
Within 3 feet of Plenum .....	6"
Within 3 to 6 feet of Plenum .....	6"
Beyond 6 feet of Plenum .....	1"

Area between the furnace and combustible ducts are insulated according to NFPA Bulletin 90B. This copyrighted book is available from National Fire Protection Association, 60 Batterymarch Street, Boston, Massachusetts 02110.



## CENTRAL FURNACE INSTALLATION

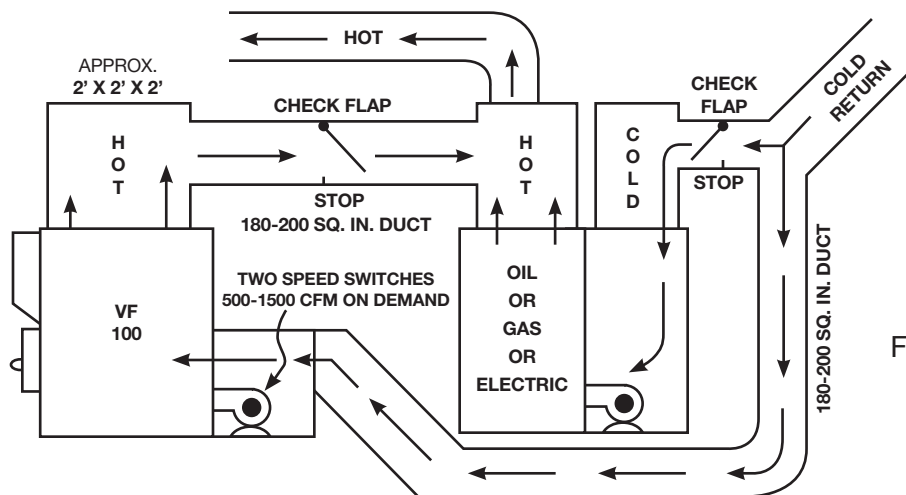


DUCTS SHOULD BE LARGE ENOUGH TO HANDLE GRAVITY AIR FLOW IN EVENT OF ELECTRIC POWER OR FURNACE FAN FAILURE (APPROXIMATELY 180-200 SQ. IN.)

WARM AIR DUCTS MUST BE CONSTRUCTED ENTIRELY FROM METAL DUE TO HIGH TEMPERATURES WHEN OPERATED DURING ELECTRIC POWER FAILURE.

Figure 3

*This is the just a basic idea to tie the two systems together. The cold air return could be just an open stairway or large floor grill.*



FOR POWER OUTAGE CHECK FLAPS.

MUST ALLOW FOR GRAVITY FLOW.

## CHIMNEY INFORMATION

The chimney is one of the most important yet most neglected and misunderstood portions of any Solid Fuel Burning Installation. THE FURNACE SHALL NOT BE CONNECTED TO THE CHIMNEY WITH OTHER HEATING DEVICES.

### CAUTION

**THE CHIMNEY MUST BE A CLASS "A" CHIMNEY IN GOOD OPERATING CONDITION. DO NOT CONNECT THIS UNIT TO A CHIMNEY FLUE SERVICING ANOTHER APPLIANCE.**

There are two types of Class "A" chimneys:

1. Masonry with tile liner suitable for venting residential or building heating appliances. (See NFPA 211.)
2. Class "A" Chimney, listed or certified by a nationally recognized testing agency as suitable for venting residential or building heating appliances. If your masonry chimney has not been used for some time, have it inspected by a qualified person (building inspector, fire department per-

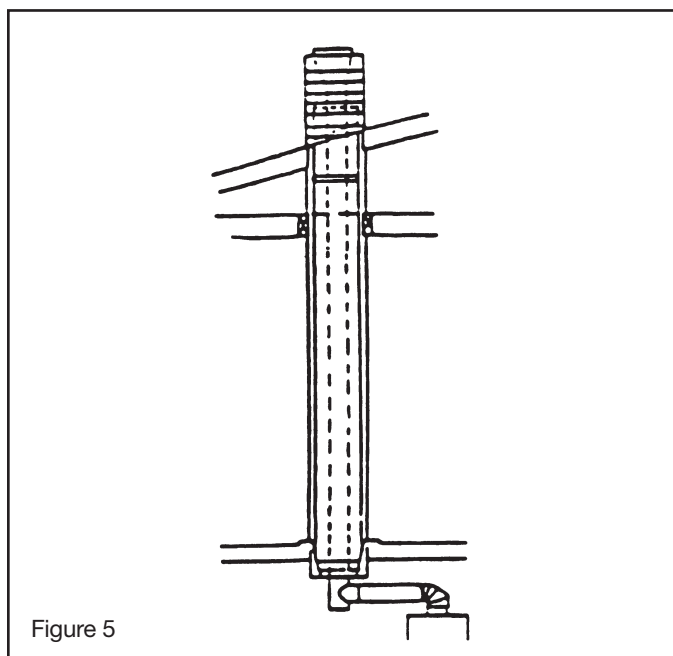


Figure 5

sonnel, etc.). If a listed or certified manufactured chimney is to be used, make certain it is installed in accordance with the manufacturer's instructions and all local and state codes. See Figure 5, Manufactured Chimney Installation and Figure 6 of Masonry Chimney (note roof clearance) in accordance with NFPA 211.

## COMMON CHIMNEY PROBLEMS

In order to have a proper operating Solid Fuel Heat System, the chimney must be capable of providing the draft required.

In the Vapor-Fire Model 100 Furnace, the required draft is .04 to .06 water column (W.C.). This can be measured using a draft gauge.

If the chimney cannot supply this constant draft, the unit will not operate properly.

In all furnace installations using Vapor-Fire Model 100 furnaces, a barometric draft regulator must be used and properly adjusted for proper draft. Provided – Set to .06 W.C. by sliding wt. to #6 vertical.

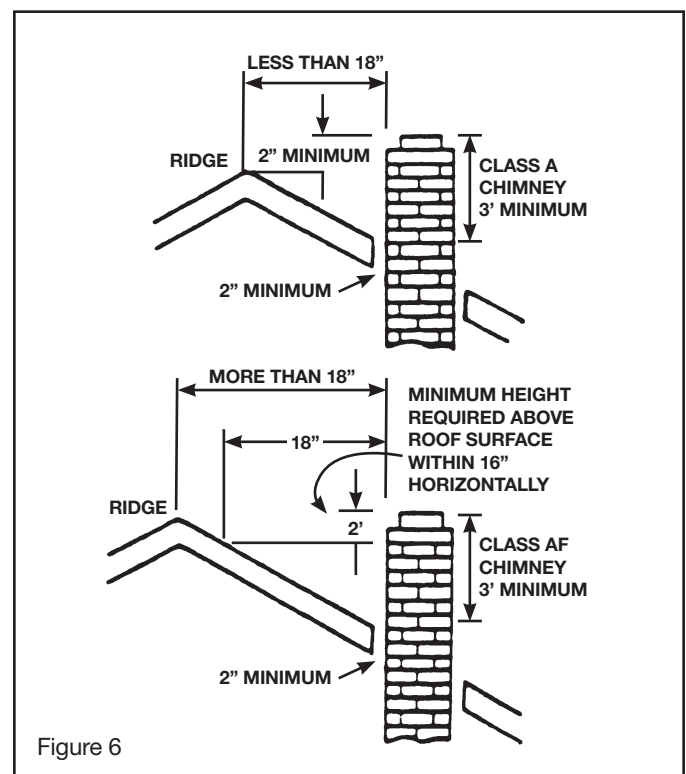
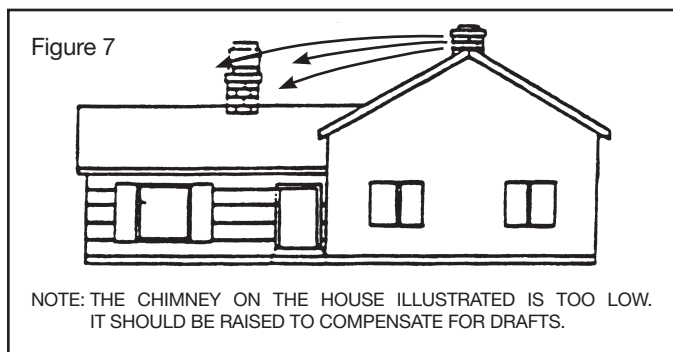


Figure 6

## REASONS for insufficient draft readings:

1. **Leaky Chimney** – Air leaking in around a loose fitting clean-out door, flue pipes not tight at the joints, improper plug openings, or defective masonry.
2. **Chimney Improper Height** – Chimney does not extend through the roof to a sufficient height to promote sufficient draft or causes a down draft condition to take place. See NFPA 211.
3. **Obstructions in the chimney** – Check prior to using holding a mirror in chimney cleanout door. This will give an inside view of the chimney.
4. **Trees or other topographical barriers** – Impending the chimneys operation or causing a down draft condition to exist. This can also be caused by adjacent building or the roof of the same structure where the chimney is not high enough (Figure 7).

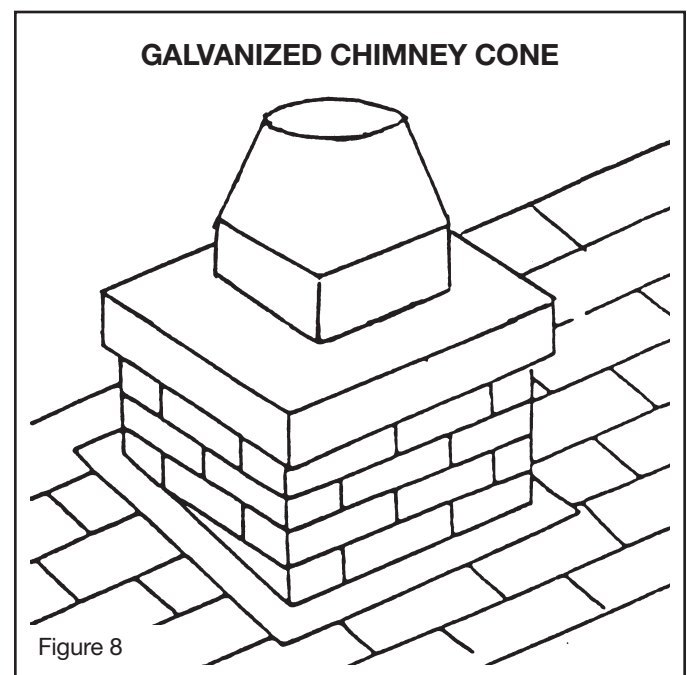


5. **Chimney Size** – Chimney is not properly sized to adequately fit the appliance. It is either too small or too large. Minimum chimney height – 14 foot. Minimum Diameter – 6 inches.
6. **Chimney Offsets** – Chimneys with offsets should not be used. They cause an obstruction to draft as well as a place for debris to collect.
7. **Elbow Restrictions** – The flue pipe is connected to the chimney with too many elbows reducing the draft the chimney can provide.
8. **Multiple Venting** – When more than one (1) device vents into the same chimney flue.

When smoke rises into the chimney, it will rise in a spiraling path.

The most important thing to remember about chimneys is their need for maintenance and cleaning. If chimneys are not cleaned on a regular basis, it affects the draft, as well as make an attributing cause to a chimney fire.

The draft can be improved by using a chimney cone (figure 8) or by extending the height of the chimney and reducing the flue area. A cone or chimney extension can be made by a local sheet metal shop.



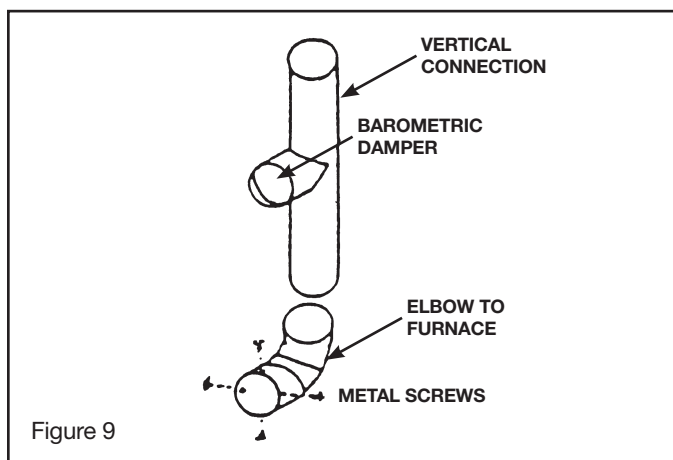
A properly operating chimney will tend to reduce the amount of creosote that is left deposited.

Instructions for installation, draft measurement, adjustment of the barometric draft regulator.

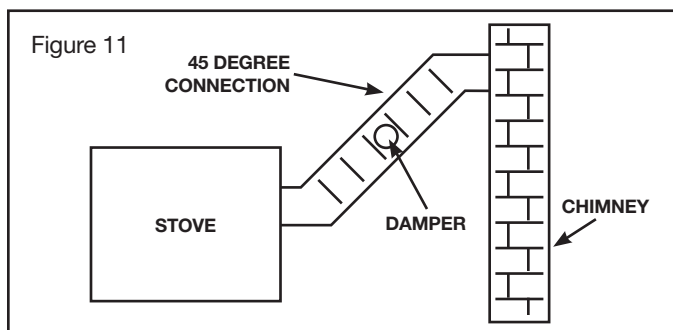


## INSTALLATION

Barometric Draft Control field 6" RC/BT provided with your model 100 Vapor Fire Furnace. A draft regulator is designed for insertion into a six (6) inch tee. Refer to Figure 9 and 11 for mounting of the barometric damper. It is recommended that the stove pipe be installed with the crimped end down so that if any creosote is formed, as a natural by-product of combustion, it will run back towards the furnace and not run through the joint to the outside of the smoke pipe. The section of pipe (tee) holding the draft regulator must be installed in either an angled or vertical direction.



Use approximate 45 degree adj. elbows for angled connections – NO HORIZONTAL PIPING.



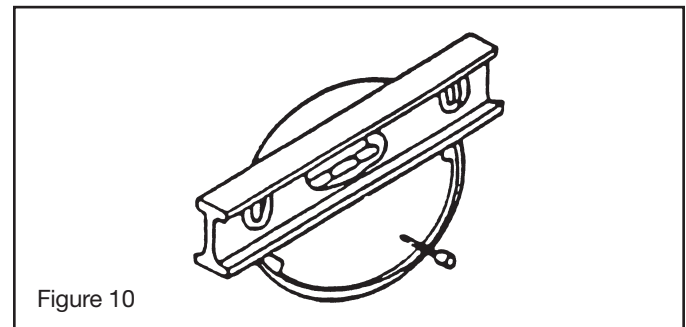
### CAUTION

**FOLLOW MANUFACTURER'S INSTRUCTIONS ON HOW TO INSTALL THE BAROMETRIC REGULATOR.**

The draft control can be positioned within its collar to an upright position.

It is essential that the draft regulator be located in the same room (pressure zone) as the furnace and as close as possible to the flue outlet.

After installation, make certain the draft control barometric regulator is upright and level. Tighten the screw to hold firmly in place. See Figure 10.



### WARNING

#### LACK OF ENOUGH AIR FOR PROPER COMBUSTION

If your house is fairly well insulated and relatively air tight, it may be necessary for you to think of providing an additional source of fresh air into your house to eliminate the possibility of starving the wood burning stove of the necessary amount for good combustion.

If you have a clothes dryer, kitchen or a bathroom exhaust fans, or even a fireplace burning and is competing for the available combustion air which could cause improper combustion. This could result in some smoke backing up into your house.

You might need to look at installing an air to air exchanger or finding another way to get some fresh air to prevent the smoke back up.

For any questions feel free to call 1-800-358-2049.

Figure 12

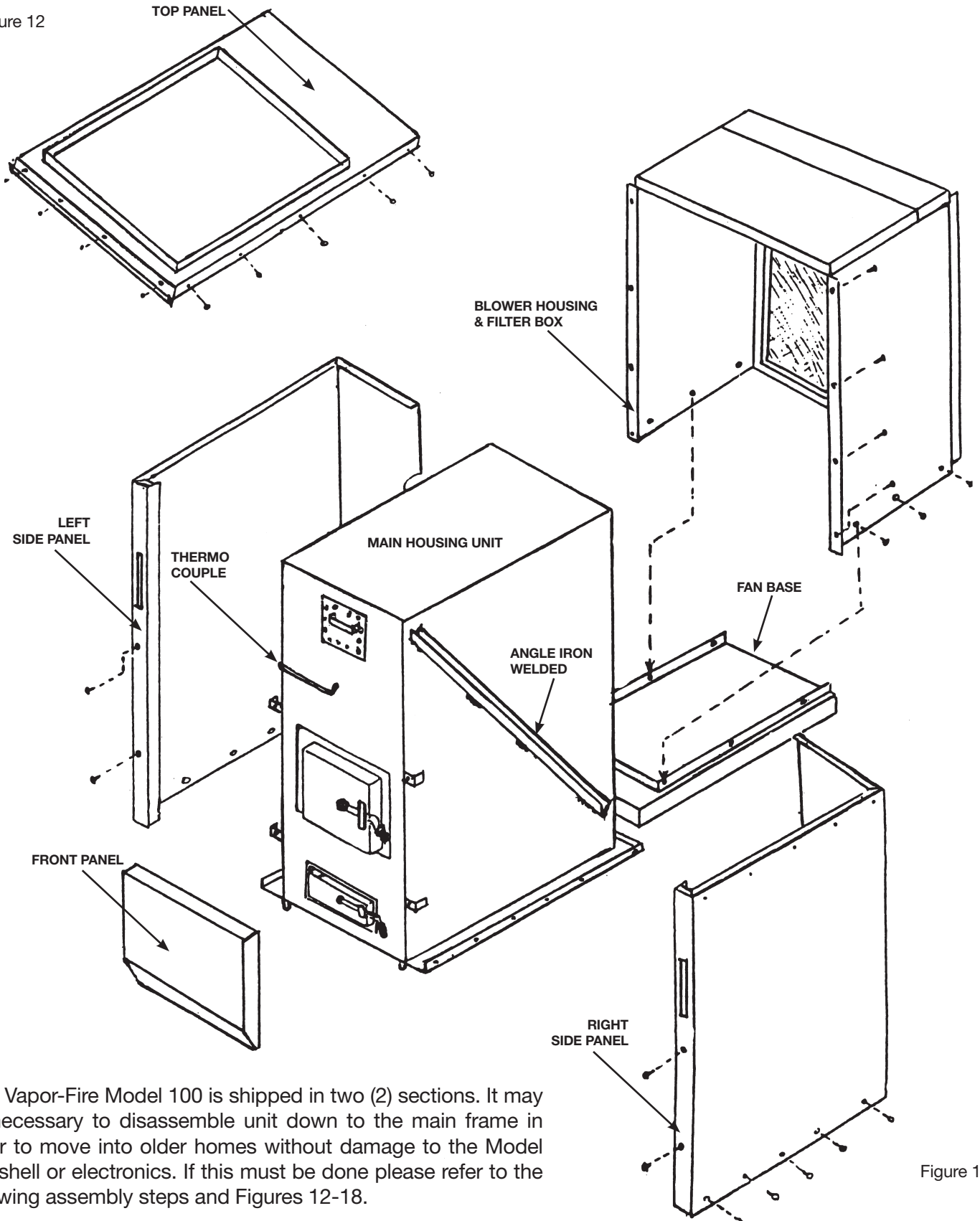


Figure 13

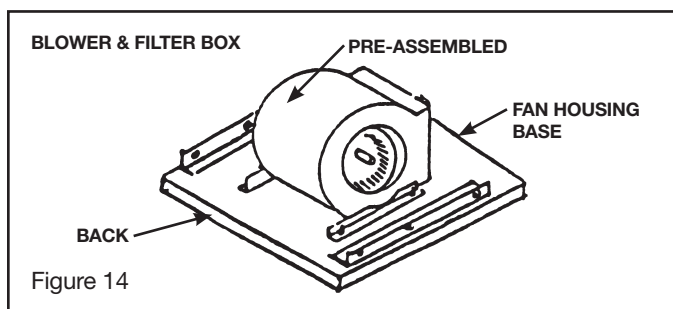
Your Vapor-Fire Model 100 is shipped in two (2) sections. It may be necessary to disassemble unit down to the main frame in order to move into older homes without damage to the Model 100 shell or electronics. If this must be done please refer to the following assembly steps and Figures 12-18.

## ASSEMBLY IF UNIT IS NOT ASSEMBLED

Set main housing unit in place, refer to figure 12, with metal screws provided, attach the right and left panels to the bottom lip of the channel as shown. Then place the top panel in place and secure it to the top of the side panels with the metal screws. Secure the front of the side panels with four screws to brackets that are welded to both sides of the main housing. Where the side panels overlap in the back fasten the overlap with the metal screws. Install the slip joint onto the back of the hood as shown. When the hood is all assembled slide the felt, with the metal slip joints into the square hole in the back.

## ASSEMBLY OF THE BLOWER & FILTER HOUSING BOX

Refer to figures 14 and 16, place fan assembly on the fan housing base so that the holes in the brackets align with the bolts that are already in the base. Place the washers and nuts in place, but don't tighten down the nuts yet. Next, attach the side panels with the metal screws that were provided. Then slide the bottom channel in place so that the holes align with the side panel holes and secure with metal screws (the holes are on each end of the channel). Do the same with the top channel and secure tightly.



Now slide the blower assembly housing towards the back of the main housing so that the base slides underneath the main housing, about 2-3 inches, making sure that the side panels are against the main housing hood and secure it with the metal screws. Make sure that the fan outlet lip slides into the felt lined square hole in the hood and forms a tight seal around the lip. Now tighten the nuts. Set the large cover in place so that the front lip slides into the slip joint in the back of the hood.

Place the air filters into the channels. Place the filter cover in place.

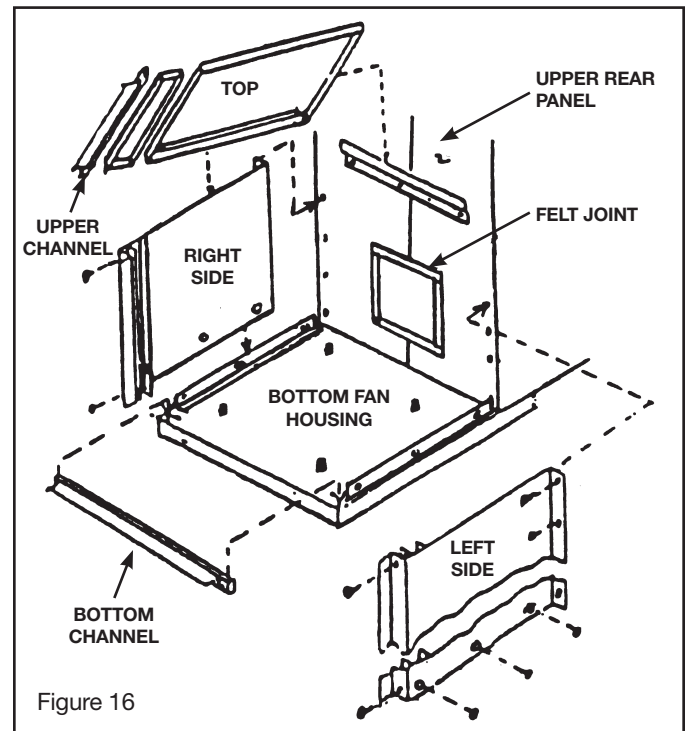


Figure 16

The completed assembly, without the fans, should look like the drawing in Figure 15.

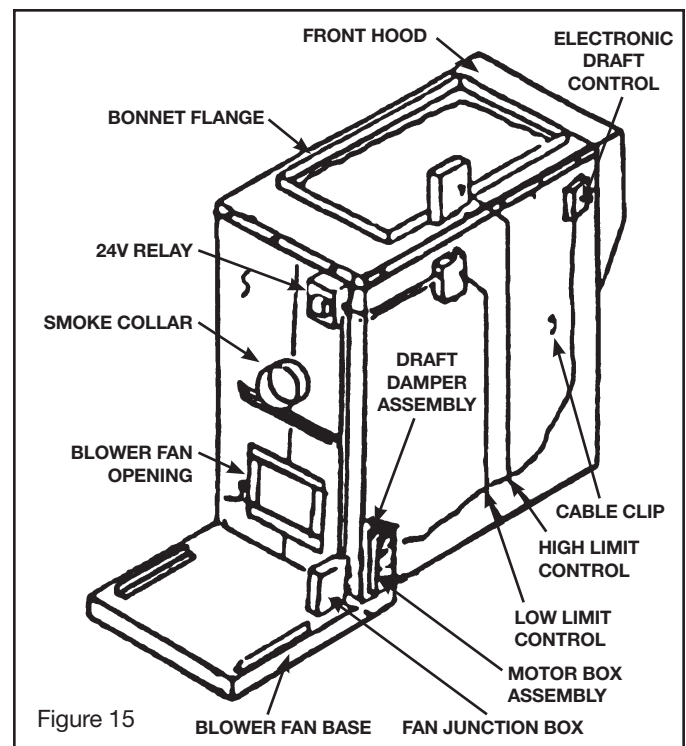
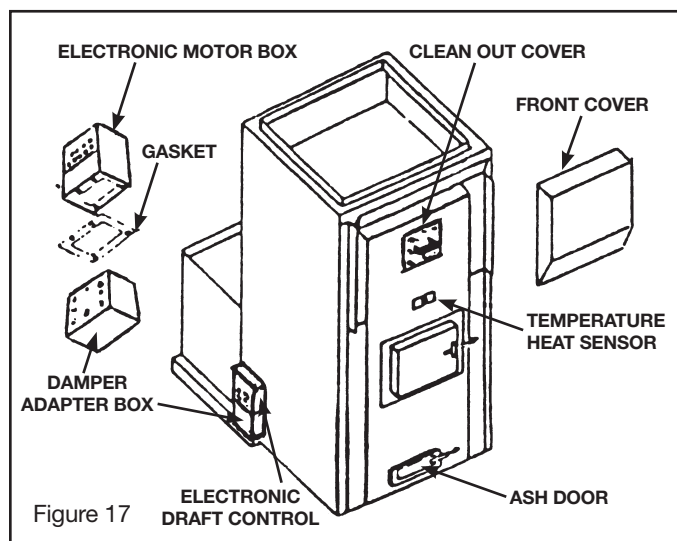


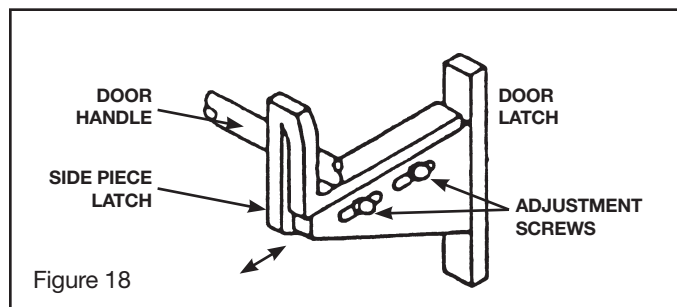
Figure 15

Add front upper cover (refer to Figure 17). Cover lifts up and slides into stove, when in, cover drops down and is locked in place.

Fasten the draft control with gasket to the draft intake assembly (four screws). Note that it is critical to keep this complete assembly airtight.



To tighten the door on the handle side – loosen the two set screws, lower handle behind latch, push door in tightly and tighten set screws. (Figure 18)

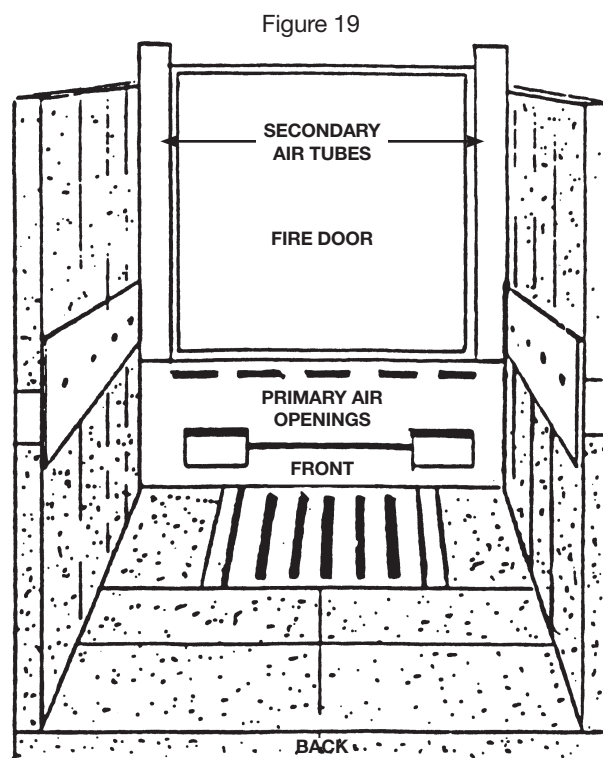


**THE LOGS BURN FROM THE FRONT TO THE BACK.**

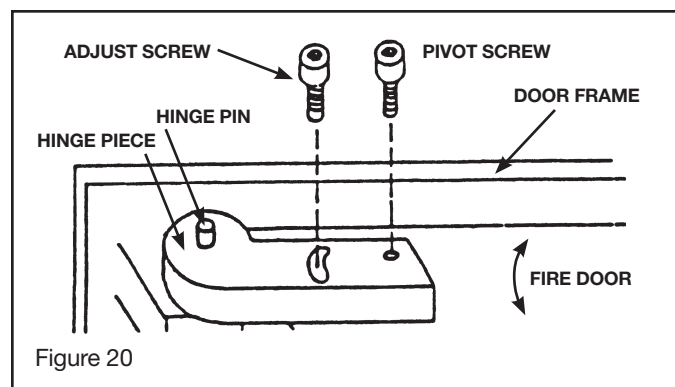
The fire chamber (brick liner), grate, preheating intake air chamber, primary and intermediate air distributor is illustrated in figure 19, with the back removed.

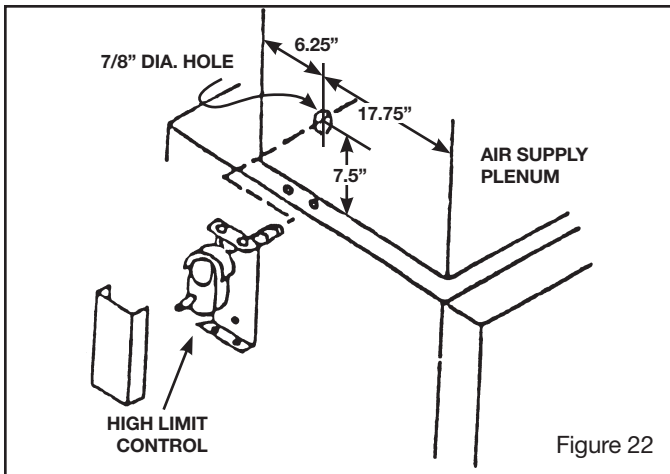
Check vertical secondary air tubes to see if they are in place. (Figure 19)

Inspect grate to see that it is setting flush with the fire box floor.



When adjusting doors, loosen the two screws (Figure 20) and push door in until there is a slight bind. As you close the door, making sure it is not too tight, tighten the screws.

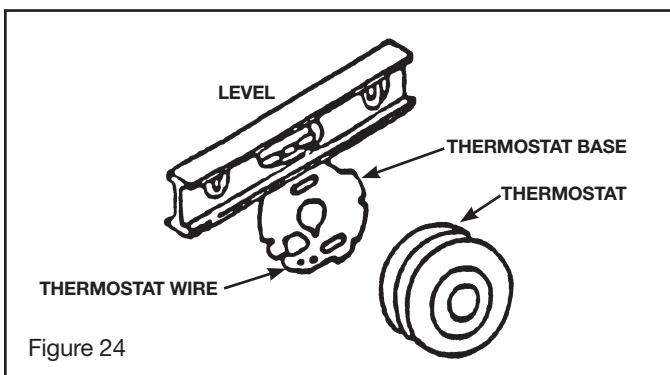




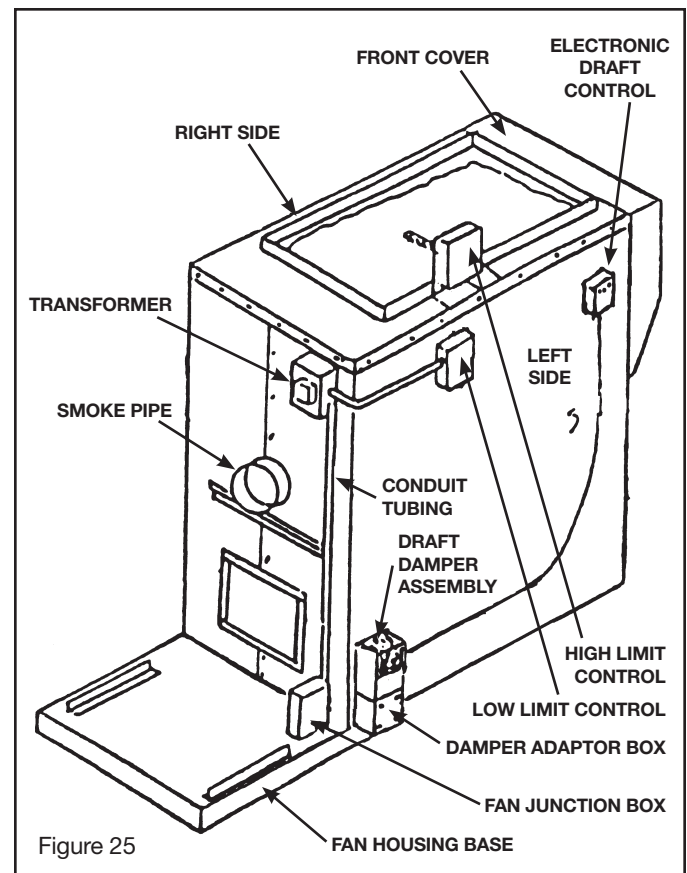
Install warm air plenum and cut hole for high limit control. Refer to Figure 22.

Refer to wiring diagram Figure 23 and 25.

- A. Mount control transformer.
- B. Mount high limit control.
- C. Mount low limit control.
- D. Mount electronic control.
- E. Connect thermocouple to terminals (yellow lead to - red lead +).
- F. Connect conduit from draft control box to fan junction box with conduit nut and connect wires.
- G. Run conduit from transformer to low limit switch and fan junction box, Figure 26.



- H. Add wires as shown in Figure 23 and connect.
- I. Mount thermostat in house and connect to relay control (24 VAC). Refer to Figure 23.
- J. Connect wiring to fans in fan enclosure as shown in Figure 23.
- K. Run incoming conduit to transformer junction box and connect to a separate circuit breaker panel. Use a 15 amp AWG copper wire to the furnace. Ground the furnace to the electrical system ground.
- L. We recommend that a licensed electrician do the electrical wiring.
- M. With wiring completed, check the system by turning on the power. The light on the electronic control should energize. The draft control will remain closed until the thermocouple is heated to approximately 100-120 degrees F.



- N. Install the cool air return plenum over the filters at the rear of the furnace. See Figure 3.
- O. Install the chimney smoke pipe along with the barometric draft control furnished with the furnace. See Figure 10.
- P. Set draft for maximum setting. (.06 WC) Slide WT to #6 Vertical.

320 Volt AC surge protector may be installed. One leg connects to the red/brown connection and the other to the white neutral connection on the 115 volt side (inside cover) of the 24 volt relay. (This prevents surges to the 24 volt electronic control when the blower switches from high to low speed.)

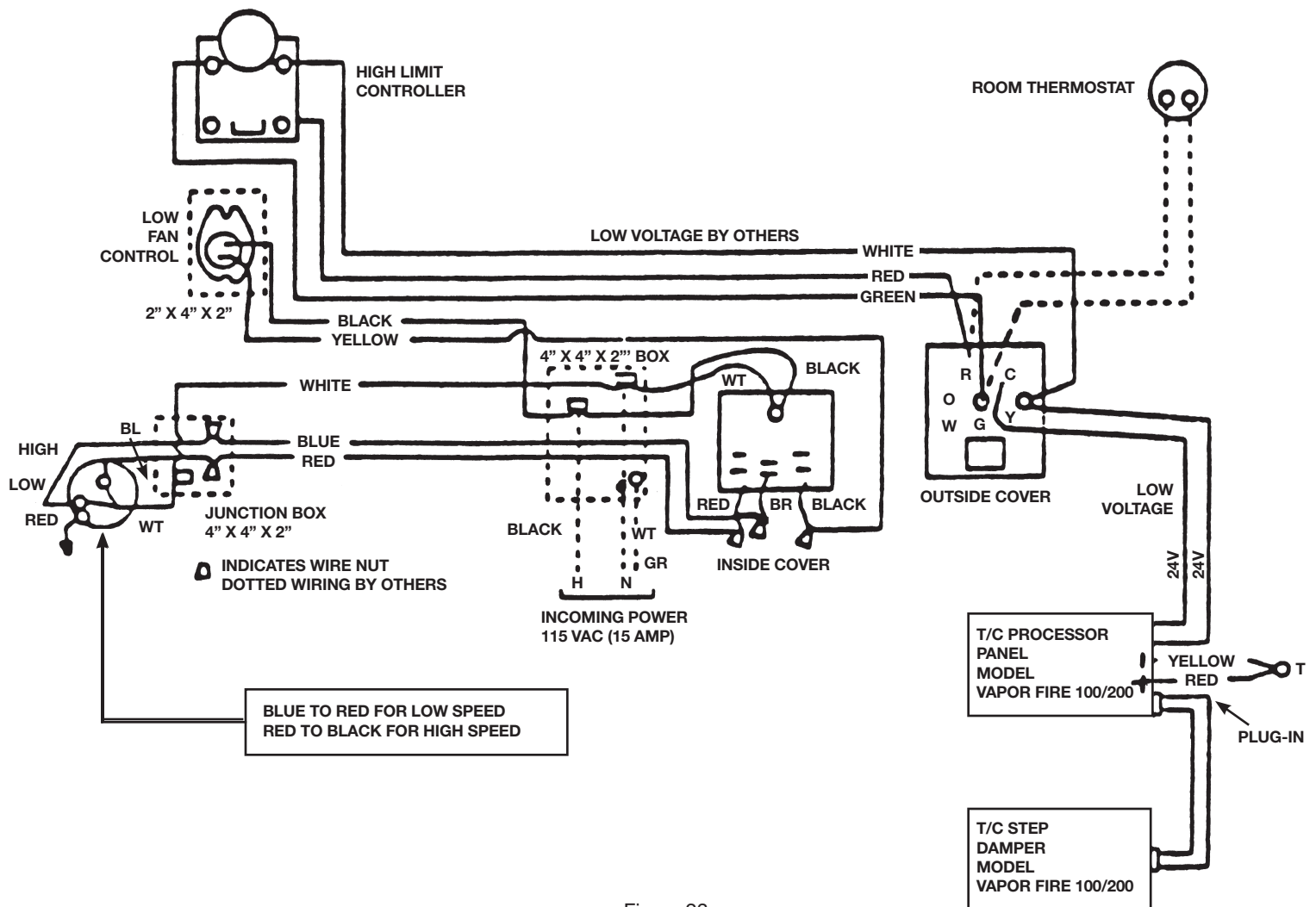
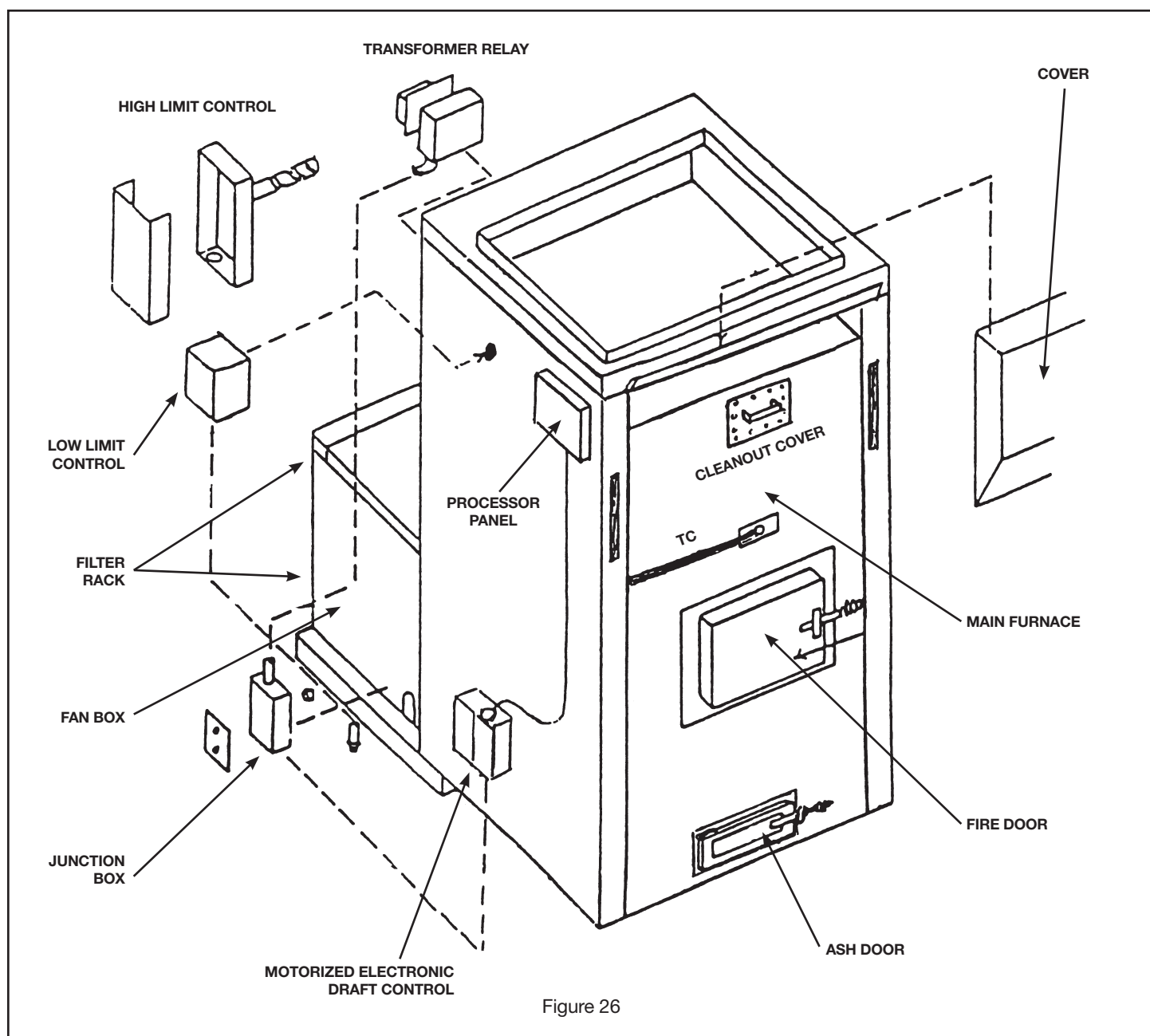


Figure 23



### INSTRUCTIONS ON CONNECTING THE 6" STOVE PIPE

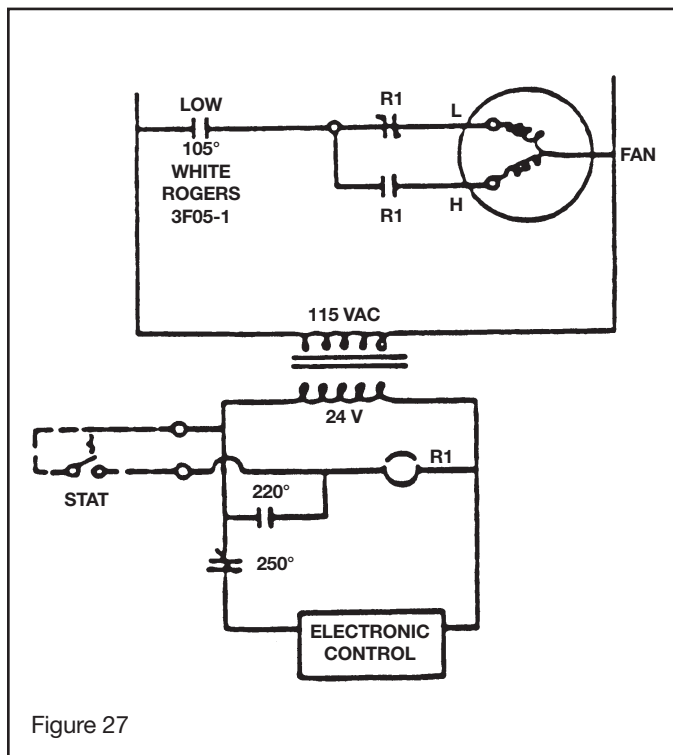
1. Use 24 ga. stove pipe and adjustable elbows.
  2. Angle your stove pipes upward towards the chimney smoke exit hole.
  3. Install barometric damper provided.
  4. Avoid using 90 degree pipe bends unless it's one 90 degree and then straight up.
  5. Use sheet metal screw to attach all the pipes with at least three screws evenly spaced around the pipe and any joint.
  6. Check and inspect pipes periodically for corrosion or any other defects.
- SAFETY SHOULD ALWAYS BE NUMBER ONE



## NORMAL AUTOMATIC OPERATION

When power is turned on the furnace is cold, the draft will be closed. As the temperature in the fire box rises to approximately 100-120 degrees F., the automatic draft opens allowing combustion air to enter the fire chamber. As the temperature in the fire chamber rises, the automatic draft will begin its throttling process until it is completely closed, allowing maximum furnace idling. (When it reaches your desired setting)

As the outer heat exchanger temperature rises past 105 degrees F. The secondary fan (low speed) starts automatically and continues to operate until the fire burns down and the heat exchanger cools to approximately 90 degrees F. This is adjustable.



The primary fan (high speed) will turn on automatically provided the side jacket is at 105 degrees F whenever the remote room thermostat is calling for heat. The fan will also turn on automatically if the plenum temperature rises to the setting on the high

limit switch (set at approximately 220 degrees F.) and will continue to operate until the temperature of the plenum has cooled down to approximately 100 degrees F. The high limit is set at approximately 250 degrees F. and if this temperature is ever obtained, the electronic control will be entirely de-energized and the automatic draft controller will close. Conditions will remain in this state until plenum temperature has cooled with large fan running allowing the automatic high temperature cut-out switch to reset the controller.

If this condition ever occurs, check to see if the damper from the plenum is closed or for any obstructions in the cool air return or in the air supply ducts and registers.

Indicating lights are furnished on the electric control to provide the following:

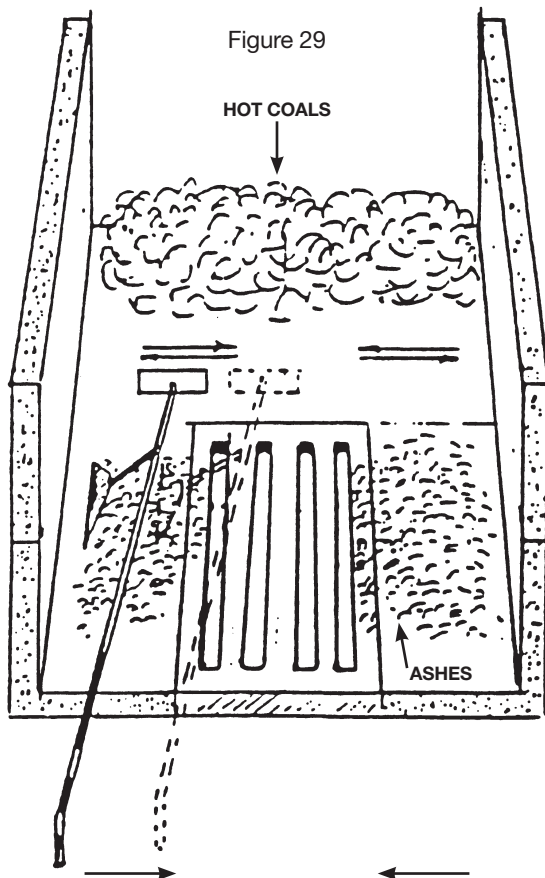
- A. The RED THERMOCOUPLE LIGHT is on when there is an open circuit in the thermocouple. The automatic draft will remain CLOSED. Replace the thermocouple.
- B. The GREEN LOW TEMPERATURE INDICATOR LIGHT is on when the fire chamber is cold (70-100. F) and this indicates that the automatic draft damper is closed. To heat the fire chamber, start the fire with the ash pan door open, as soon as the GREEN LIGHT goes off CLOSE the ASH PAN door. The draft indicator lights will come on.
- C. The DRAFT INDICATOR LIGHTS are on indicating that the various draft damper stages are open.
- D. The RED HIGH TEMPERATURE INDICATING LIGHT & BEEPER are on when the temperature in the fire chamber is too high. If this condition occurs check the "to do" list located on the processor panel (circuit board).
- E. If you are unable to solve the problem, call the factory 1-800-358-2049.



### IMPORTANT

**KEEP ASH DRAWER EMPTY.**

**IF ASHES ARE PERMITTED TO BUILD UP ABOVE THE GRATE, THE GRATES COULD WARP AND EVENTUALLY BURN OUT.**



### DANGER

**NEVER BURN MATERIALS OTHER THAN WOOD LOGS, PREFERABLY SPLIT AND DRIED.**

**A CHIMNEY FIRE OR HEAT EXCHANGER FAILURE COULD RESULT. THIS INCLUDES LARGE AMOUNTS OF CORRUGATED BOXES, WOODSHAVINGS, PAPER SCRAPS, DRIED CHRISTMAS TREES, COAL, GARBAGE, TIRES OR OTHER BURNABLE PRODUCTS.**

### DOS AND DONT'S OF OPERATION

Wood Firing the Unit

### IMPORTANT

**DURING NORMAL OPERATION, FIRING DOOR AND ASH DOOR MUST BE KEPT TIGHTLY CLOSED. AIR LEAKAGE WILL CAUSE LOSS OF EFFICIENCY RESULTING IN HIGHER HEATING COSTS. IF DOOR GASKETS BECOME WORN, REPLACE WITH 5/8" AND 1/2" CERAMIC ROPE AVAILABLE FROM LOCAL SOURCES.**

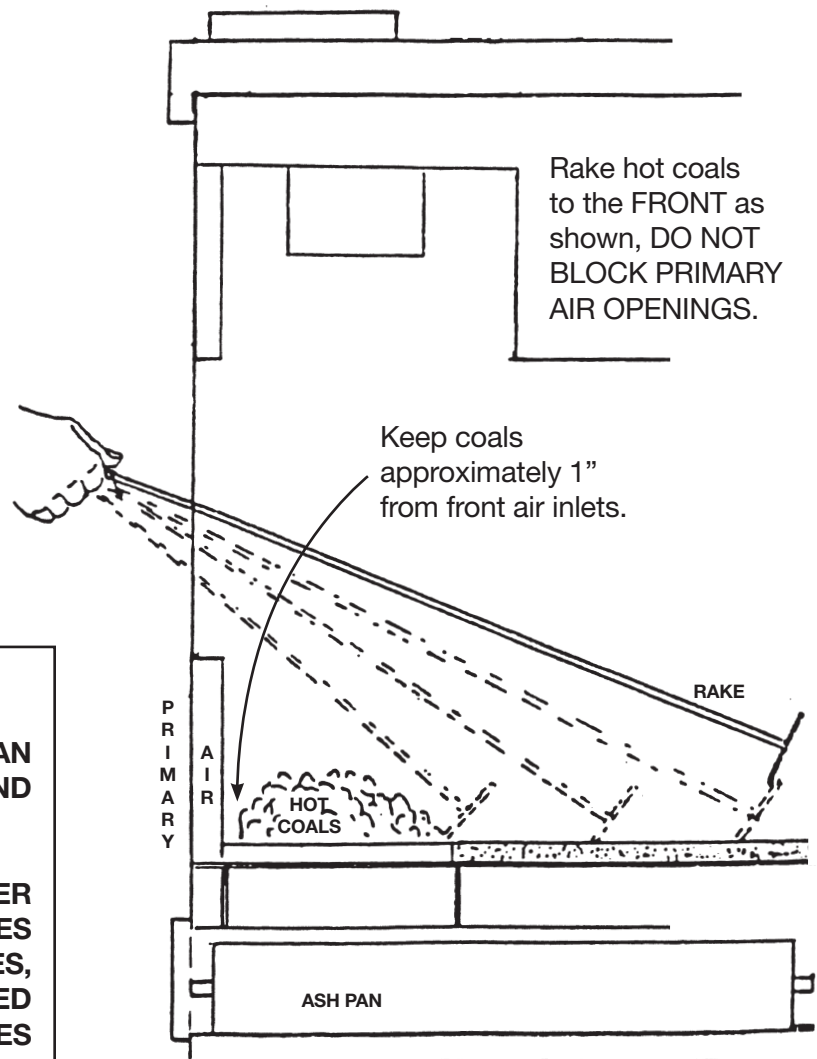


Figure 30

## BASIC FIRING INSTRUCTIONS

### RULES TO FOLLOW

- A. Use dry seasoned wood (15 to 30 percent moisture content), soft wood cut and split in the spring and dried over the summer under cover. Hardwood requires one year drying time – fall to fall.
- B. Use a maximum of 22 inch wood lengths.
- C. Never burn less than two (2) rows of wood (3 pc. min.) in a triangle shaped pile.
- D. Always preheat a cold stove before any wood lengths are added by burning paper and kindling.
- E. ALWAYS RAKE COALS FORWARD TO THE FRONT BEFORE ADDING WOOD LENGTHS, NEVER RAKE THEM ANY CLOSER THAN 1" FROM THE FRONT AIR INLET HOUSING.
- F. ALWAYS ADD WOOD LENGTHS LENGTHWISE IN THE FIRE CHAMBER AND PLACE THEM IN THE FIRE CHAMBER SO THAT THE FRONT FACE OF THE WOOD IS APPROXIMATELY ONE (1) INCH AWAY FROM THE AIR INLET HOUSING. BOTTOM PIECES MUST MAKE CONTACT WITH THE HOT COALS THAT WERE RAKED FORWARD.
- G. Keep the front approximately one-third (1/3) 9" portion of the fire chamber free of ash by scraping the ashes through the open front grate and into the ash pan using rake provided.
- H. With the fire chamber cold, periodically empty the ash pan via the ash pan door. Secure the door tightly when finished.

### STARTING A COLD FURNACE – NO HOT COALS

- A. Open fire door.
- B. Scrape entire fire chamber ashes through open grate, into ash pan using side paddle on ash scraper provided.

- C. Preheat fire chamber with generous cuts of paper and kindling and light.
- D. Close fire door – allow to preheat 5-10 minutes.
- E. Open fire door.
- F. Rake hot coals forward.
- G. Add full lengths of wood (18-22" minimum of two rows) 1 to 2 inches from front face air inlets usually against back wall.
- H. Close fire door tight – the fire and heat will be electronically controlled.

### STARTING WITH WARM FURNACE AND WITH HOT COALS

- A. Open fire door.
- B. Scrape front approximately 9" (1/3) of fire chamber ashes through open grate. Scrape front corners, using side paddle. Ashes in the front are usually grey and fluffy.
- C. Rake hot coals forward.
- D. Add wood lengths (minimum of two rows) so that there is at least 1 to 2 inches of space between front of log and front face of air inlet.
- E. Close fire door tight – fire and heat is electronically controlled.

#### CAUTION

**YOU MUST CHECK YOUR CHIMNEY FLUE PIPE CONNECTOR FREQUENTLY WHEN FIRST STARTING TO BURN WOOD TO DETERMINE THE AMOUNT OF CHIMNEY MAINTENANCE (CLEANING) THAT WILL BE REQUIRED. THIS, OF COURSE, IS ALSO DEPENDENT ON WOOD TYPE, MOISTURE, AND, IN GENERAL, HOW THE FURNACE IS USED.**

## **RUNNING FURNACE DURING POWER FAILURE**

If unit was in operation during power failure leave ash door closed, leave fire door closed.

### **CAUTION ELECTRIC POWER FAILURE**

- TO IMPROVE GRAVITY AIR FLOW REMOVE AIR FILTERS.**
- DO NOT TAMPER WITH WOOD PRIMARY AIR CONTROL.**
- OPEN ALL AIR REGISTERS AND REMOVE ALL OBSTRUCTIONS NEAR THEM.**
- KEEP CHILDREN AWAY FROM AIR REGISTERS, OR BURNS COULD RESULT.**
- PRIMARY AIR DAMPER WILL OPERATE AUTOMATICALLY WHEN ELECTRIC POWER IS RESTORED.**
- REMOVE FRONT LIFT OFF HOOD FOR MORE GRAVITY HEAT FLOW.**

### **NOTE**

**IF FOR ANY REASON THERE SHOULD BE AN ELECTRIC POWER FAILURE, EITHER FROM HIGH LIMIT CUT-OFF OR ELECTRICAL POWER OUTAGE, THE DAMPER WILL AUTOMATICALLY CLOSE, PREVENTING OVER-FIRE WITH NO BLOWER AND HEAT EXCHANGER DAMAGE.**

## **WOOD BURNING FACTS**

**BE AWARE OF CREOSOTE "BUILD-UP" WHEN BURNING WOOD!**

Wood burning equipment will give you trouble with creosote deposits under certain conditions, unless you are aware of these conditions and avoid them.

Creosote is a tarry liquid or solid resulting from the distilling of wood during the combustion process. It consists of a number of elements which condense and bake layer upon layer in the chimney flue.

### **WARNING**

**SERIOUS FIRE MAY RESULT IF A SUFFICIENT CREOSOTE "BUILD-UP" IS PERMITTED OVER AN EXTENDED PERIOD OF TIME.**

Highly combustible in its solid and semi-liquid state, creosote is present in the gases given off by burning wood. Creosote may build up a considerable thickness on the interior surface of the chimney and flue pipes, considerably reducing their cross-sectional area.

Creosote condenses from the flue gases when the stack temperature drops below 250 degrees F. The amount of creosote deposited in the pipe and chimney is dependent on the amount of moisture in the flue gases, the temperature of the stack, and how completely the combustible elements in the flue gases have been burned in the combustion process. Most problems with creosote are due to poor chimneys with low draft and cold walls and to a low rate of burning when heat is needed during the spring and fall months.

Moisture in the flue gases may be controlled by using the driest wood possible, mixing small pieces with a very full load, and never using only large wood during mild weather when combustion is relatively slow.

## BEST WOOD FOR BURNING

Generally wood should be cut at least a year in advance and properly split at that time.

This wood should also be stored out of the weather, if possible. If the wood is to remain outside, be sure to cover the top of the wood piles with sheets of metal, etc. This wood should be brought inside and stored there for at least two (2) weeks before it is fired to obtain top performance.

Soft woods burn at a faster rate per cord than do hard woods, and have less BTUs per cord.

Know what types of wood to burn. Wood is safe, clean and economical fuel. Freshly felled wood is not suitable fuel due to the moisture content of the wood. Well-seasoned wood is best for the proper production of heat. The following table will give you some relative values of the heating content of some of (the more readily available wood).

Type	Weight Cord	BTU's Per Cord Air Dried Wood	Equivalent Value #2 Fuel Oil Gallons
White Pine	1800#	17,000,000	120
Aspen	1900	17,500,000	125
Spruce	2100	18,000,000	130
Ash	2900	22,500,000	160
Tamarack	2500	24,000,000	170
Soft Maple	2500	24,000,000	170
Elm	2750	24,500,000	175
Yellow Birch	3000	26,000,000	185
Red Oak	3250	27,000,000	195
White Oak	3750	27,700,000	200
Hard Maple	3000	29,000,000	200
Hickory	3500	30,500,000	215

## USEFUL FACTS

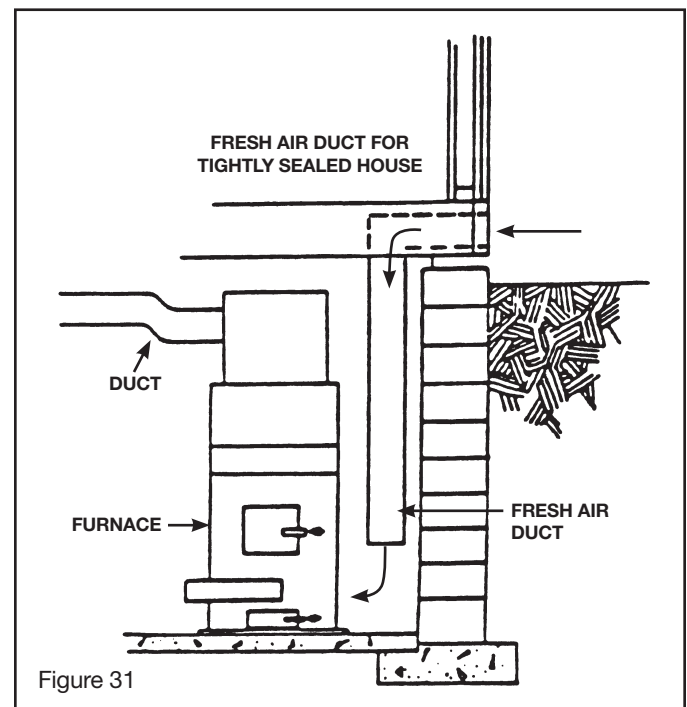
No. 2 Fuel Oil – 140,000 BTU/gallon  
Natural Gas – 100,000 BTU/therm  
Propane Gas – 93,300 BTU/gallon  
Butane Gas – 100,671 BTU/gallon  
Electricity – 3,413 BTU/kilowatt – hour

## TROUBLESHOOTING

**IMPORTANT:** Your Vapor-Fire Furnace is a controlled combustion solid fuel burning device that heats by the pyrolysis of wood at a slow rate. If you load the furnace and in a short period of time open the fire door, smoke will be expelled from the fire door. This is to be expected.

### SMOKE PUFFS FROM VAPOR-FIRE FURNACE

- Check the chimney draft. With a wood fire burning, the chimney should supply .04" to .06" up-draft.
- Check automatic draft control for proper operation.
- Check the smoke pipe and be sure it's clean.
- Chimney may be too low. Increase its height. Make sure the chimney is structurally sound.
- Add more air to the furnace room. Your home may be so airtight, not enough oxygen is reaching the fire. Your heating contractor can do this. Refer to Figure 31.



### IMPORTANT

**NEVER OPERATE YOUR VAPOR-FIRE FURNACE WITH THE FIRE OR ASH DOOR OPEN.**

- F. Check the smoke pipe and make certain each joint is tight and the connections to the Vapor-Fire Furnace and chimney are air tight.
- G. Check the ashes. Ash pan and fire compartment may be overloaded with ashes.
- H. Check type of wood being burned. If too green or wet wood is being used, it may cause excessive smoking.
- I. Check your chimney for down drafts. This is caused by air currents being deflected down the chimney from higher objects, such as trees, buildings, and hills. This problem can usually be corrected with an open vented chimney cap.
- J. Make sure the chimney clean-out door is tightly closed.
- K. If other fuel-burning devices are connected to the chimney, they may be causing draft problems. This must be corrected by your heating contractor.
- L. Remove any mesh from your chimney cap.

### YOU ARE NOT RECEIVING ENOUGH HEAT FROM YOUR FURNACE

- A. Make sure the pipe or duct from the Vapor-Fire Furnace, as well as the pipe connections, are air tight.
- B. The cold air return of your forced air upflow furnace is blocked. NEVER PLACE SOLID OBJECTS IN FRONT OF OR OVER THE COLD AIR RETURNS IN YOUR HOME.

C. The cold air return of your forced air upflow furnace is inadequate. It may be necessary to increase its capacity.

D. If you don't seem to get enough air circulation – POSSIBLE CAUSES:

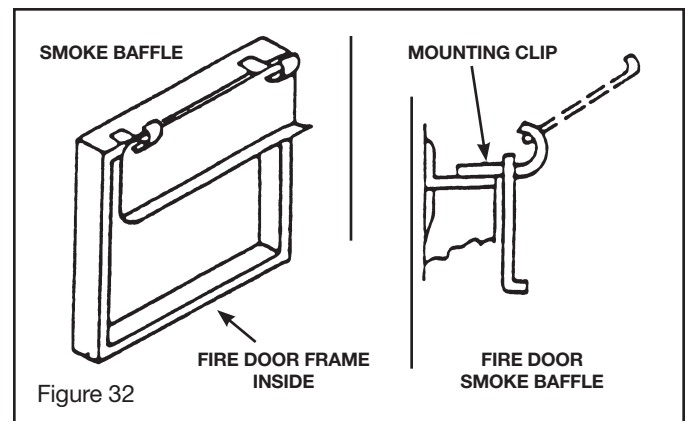
1. Air filter is dirty. Clean or replace air filter, as necessary.

2. Registers and grills are obstructed. Check supply pipe or damper positions. Check registers and grills to make sure they are not closed or obstructed by carpet, draperies or furniture. Remove any obstructions.

E. Contact your dealer or installer for further technical assistance.

### SERVICE HINTS

- A. Thermostat is not set correctly. Check adjustment.
- B. No electric power to furnace. Check fuse or circuit breaker. If fuse is blown, replace. If breaker is tripped, reset. Check to be sure shut off switch is "ON".
- C. Clean the inside of heat exchanger through opening on the front face of main housing unit. Remove plate covering the opening and scrape the inside of exchanger clean. Remove any loose soot through the flue collar in rear of stove.



- D. Smoke baffle not in place. Refer to Figure 32 for proper installation.
- E. Automatic damper fails to open. POSSIBLE CAUSES:
  - 1. Improper thermocouple wiring. Recheck field wiring against wiring diagram (Figure 10 and 24).
  - 2. No power to electronic control. Check transformer wiring. Wiring diagram (Figure 24).
  - 3. Motor damper return spring too tight. Adjust for less tension.
- F. Room thermostat not working. Reset the high limit bonnet control by turning counter clockwise until you hear a click. If this does not correct the problem, replace thermostat.

#### **FLOORS ARE COLD**

- A. Return (cold) air grills blocked. Check to make sure rugs and carpets are not covering return air grills.
- B. Air filter is dirty. Clean or replace air filter, as necessary.
- C. System is out of balance. Check supply pipe dampers or registers to balance system.

#### **BLOWER/MOTOR IS NOISY**

- A. Blower motor and/or blower housing need tightening.
- B. Air filter is dirty. Clean or replace air filter, as necessary.

#### **SMOKE PUFFS OUT THROUGH DOORS**

- A. Chimney draft incorrect. Check chimney draft. With normal wood fire, chimney should draw .04 to .06" W.C. between furnace and barometric control.
- B. Soot and creosote buildup in heat exchanger or chimney. Clean if necessary.
- C. Chimney too low. Increase chimney height.
- D. Obstruction in chimney. Check for obstruction such as loose mortar, bird nests, squirrels nests. Clean chimney to eliminate obstructions.
- E. Not enough fresh air to furnace room. Check for obstructions in combustions air inlet.
- F. Chimney diameter too large. A too cold a chimney will chill flue gases as they rise up the chimney. As this gas cools, it becomes heavy and other gases from the fire try to penetrate this heavy column of cool air. This results in back puffing, poor combustion or burning, and may cause odors in your home.
- G. Chimney clean-out door partially open. Make sure chimney clean-out door is tightly closed.
- H. Other fuel burning device connected to same chimney. Make sure other device enters chimney at a higher level than your wood furnace. (It is necessary that the wood furnace have its own flue.)
- I. Remove mesh from chimney cap. It is not designed for wood burning furnaces because it reduces your updraft.



## HOW THE VAPOR FIRE ELECTRONIC DRAFT CONTROL WORKS

READ OVER THE FOLLOWING EXPLANATIONS VERY CAREFULLY

1. When you first turn on the power – the 24 volt electronic control is energized, the controls high temperature siren sounds for only a short time, then after this, the control will automatically go to the low temperature setting which is when only the GREEN LIGHT is on.
2. When first starting a fire, you may open the ash pan door for a very short while until the control senses the heat which is being generated by the fire. Once the control senses the heat it will automatically open the draft shutter. (ALL THREE LIGHTS WILL THEN BE ON). Allow the ash pan door to remain open for a short period of time to assure that the wood has properly ignited. NOW CLOSE THE ASH PAN DOOR AND THE ELECTRONIC CONTROL WILL TAKE OVER AND IT WILL CONTROL THE DRAFT AS NEEDED TO BURN THE WOOD, MAKE SURE THE ASH PAN DOOR REMAINS CLOSED AND THAT THE LATCH IS HOOKED THROUGHOUT THE ENTIRE BURN.

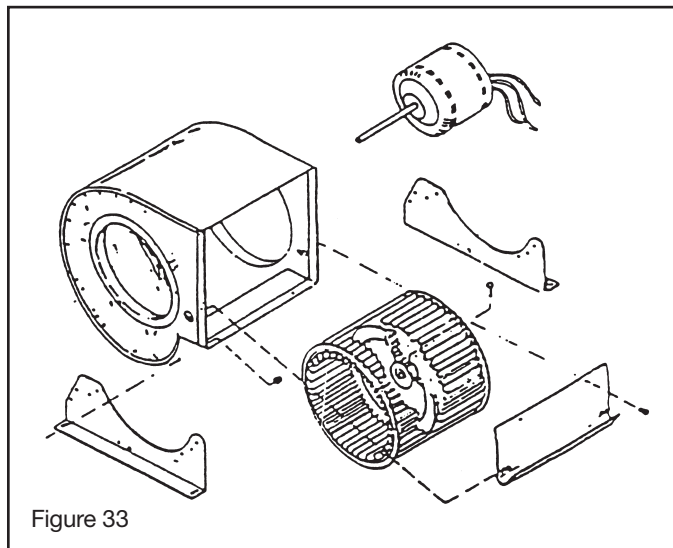


Figure 33

**\*\*\* NEVER EVER BURN THE STOVE WITH THE ASH PAN DOOR OPEN OTHER THEN DURING THE FIRST FEW MINUTES WHEN STARTING THE FIRE.**

3. The electronic control has four different stages and the lights on the control indicate how much air is entering the fire chamber, for example as follows:
  - A. At start up, ALL THREE LIGHTS are on and also again at the end of the burn cycle, this indicates that the shutter is wide open.
  - B. As the fire gradually intensifies, only two lights are on which means that the control has automatically decreased the amount of air going into the fire chamber, now the shutter is partially closed.
  - C. As the temperature in the fire chamber continues to rise, the control automatically closes so that only ONE LIGHT is on which means that the shutter is almost closed.
  - D. When the temperature in the fire chamber has reached it's optimum level, THERE WILL BE NO LIGHTS ON. Now the shutter is completely closed, the stove is now what we call on the pilot burn and will continue like this until the fire chamber cools down and then the control again takes over and will adjust the shutter opening based on the fire chamber temperature.
4. The LOW TO HIGH TEMPERATURE KNOB is used to adjust the total heat output of the vapor fire furnace, depending on what the temperature is outside.

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