



### GA100CS Series Combination Gas Fired Cast Iron Boiler and Indirect Water Heater

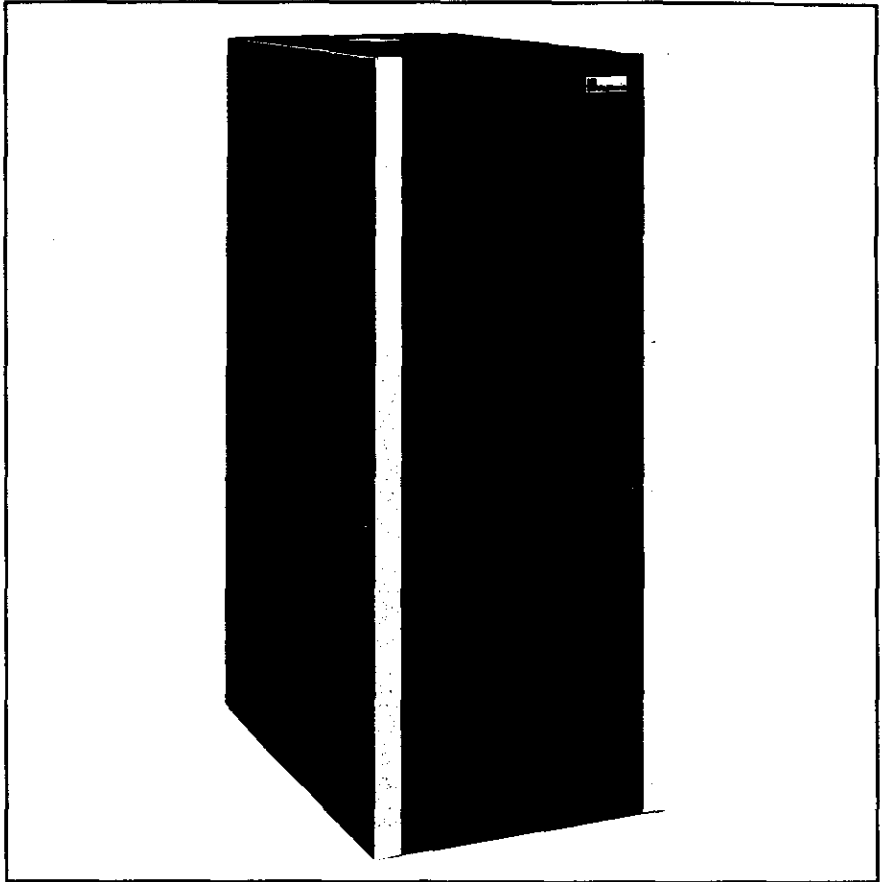


Table of Contents	Page Number
1. Boiler Dimensions & Specifications	2
2. Rules for Safe Installation & Operation	3
3. Locating the Unit	3
4. Combustion Air Requirements	3
5. Vent Pipe Connections	4
6. System Piping Boiler	5
7. Gas Supply Piping	5
8. Electrical Wiring	7
9. Flame Roll-Out	7
10. Blocked Vent System	9
11. Checkout Procedures	9
12. Maintenance Requirements	10



PRICE \$5.00



Vaillant Corp.  
2607 River Road  
Cinnaminson, NJ 08077  
(609) 786-2000  
Fax (609) 786-8465

All of our appliances should be installed by qualified fitters only, who will be responsible for the observance of all existing national and/or local installation instructions and code regulations. On installation please hand this pamphlet to your customer.

# 1. Boiler Dimensions & Specifications

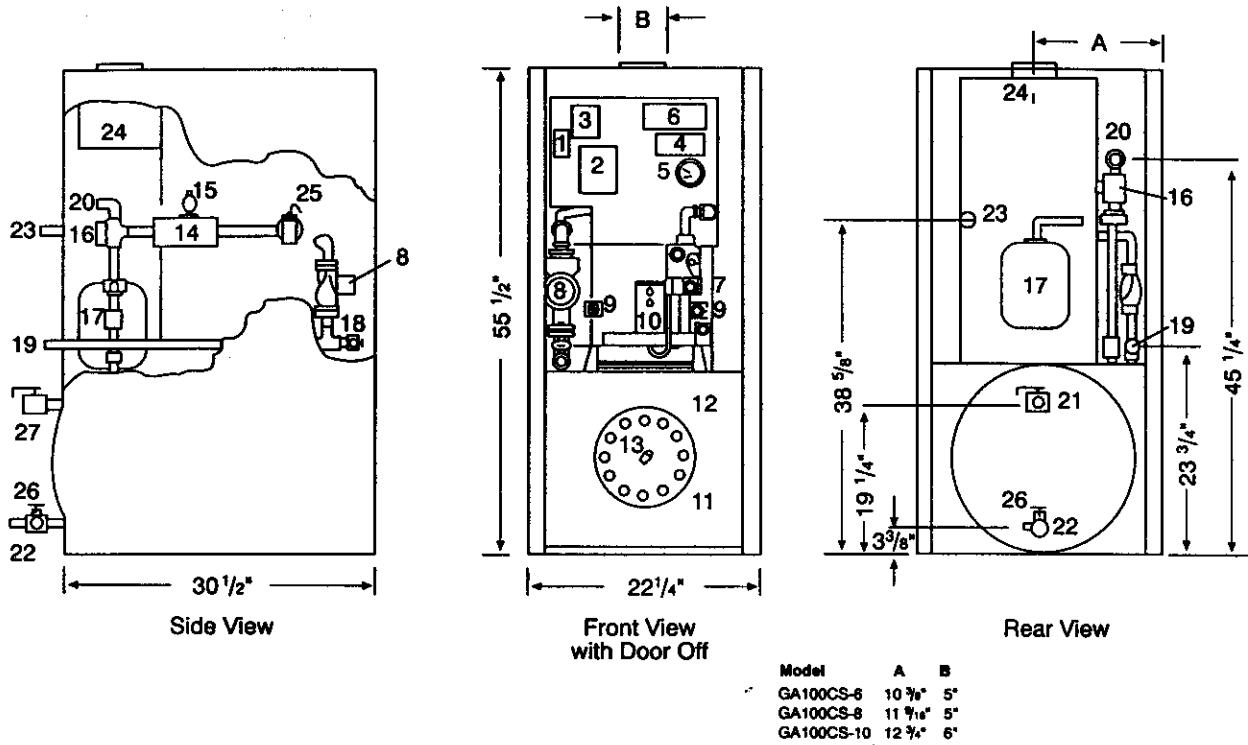


Fig. 1 - GA100 CS Series Boiler

- |                                     |                                       |
|-------------------------------------|---------------------------------------|
| 1. High Limit Control (Tank)        | 15. Vent Valve                        |
| 2. Combination Control              | 16. Diverting Valve                   |
| 3. Transformer Relay                | 17. Expansion Tank                    |
| 4. Intermittent Ignition Control    | 18. Boiler drain 3/4" NPT             |
| 5. Combination Pressure Temp. Gauge | 19. Return 1" NPT                     |
| 6. Damper Actuator                  | 20. Supply 1" NPT                     |
| 7. Combination Gas Valve            | 21. Domestic Water Out (Hot) 3/4"     |
| 8. Circulator                       | 22. Domestic Water In (Cold) 3/4"     |
| 9. Wet Leg Drain Tappings           | 23. Gas line 1/2" NPT                 |
| 10. Pilot Inspection Door           | 24. Draft Diverter                    |
| 11. Tank Inspection Plate           | 25. 30 PSI A.S.M.E. Relief Valve      |
| 12. Water Storage Tank              | 26. Tank Drain                        |
| 13. Temperature Sensor Well         | 27. 125 PSI A.S.M.E. T&P Relief Valve |
| 14. Air Scoop                       |                                       |

BOILER MODEL NO.	INPUT BTU/HR	HEATING CAPACITY BTU/HR	IB-R NET RATING BTU/HR	WEIGHT LBS.
GA100CS-6	60,000	50,000	43,000	340
GA100CS-8	80,000	67,000	58,000	360
GA100CS-10	100,000	85,000	74,000	390

## 2. Rules for Safe Installation & Operation

1. Read this manual and the Owner's Manual carefully. Failure to follow the rules for safe operation and the instructions could cause a malfunction of the boiler and result in death, serious injury, and/or property damage.
2. Check your local codes and utility requirements before installation. The installation must be in accordance with their directives.
3. Before servicing, allow boiler to cool and always shut off any electricity and gas to boiler when working on it. This will prevent any electrical shocks or burns.
4. Never test for leaks with open flame. Use soap suds to check all connections. This will avoid any possibility of fire or explosion.
5. Be certain boiler is equipped for type of gas (natural or propane) to be used. Over-firing will result in premature failure of the boiler sections and cause dangerous operation.
6. Never vent this boiler into an enclosed space. Always connect the boiler to the outside. Never vent to another room or inside a building.
7. Be sure there is adequate air supply for complete combustion.
8. Follow a regular service and maintenance schedule for efficient and safe operation.

### WHEN YOUR BOILER ARRIVES BE SURE TO SAVE AND REFER TO INSTRUCTIONS.

First, inspect each item received for visible damage or shortage. If any parts are damaged, report this to the freight company immediately, and request them to call and make an inspection before you make any installation. Have the inspector prepare a signed report. Send

Vaillant a copy of this report and we will send replacements for the damaged parts. But, we must have the signed inspection report of the freight company to prove their liability.

Examine all packaging material carefully for loose parts before discarding.

Also, store all parts received where they will not be lost or damaged.

If you have had to unpack the boiler outside, you may also have to disassemble it to carry it to the installation area. In this case, use the Parts List drawings herein to guide you.

NOTE: The GA100 CS Series of boilers were evaluated by the American Gas Association to certify that they meet all of the safety criteria of ANSI standard Z21.13a-Latest Edition "Gas Fired Low Pressure Steam and Hot Water Boilers." Safe lighting and other performance criteria were met with the gas manifold and control assembly provided on the boiler when the boiler underwent tests specified in this standard.

The following steps are all necessary for proper installation and safe operation of the boiler.

1. Locating the boiler.
2. Fresh air for combustion.
3. Chimney & vent pipe connection.
4. System piping.
5. Gas supply piping.
6. Electrical wiring.
7. Check out and adjust.
8. Maintenance.

## 3. Locating the Unit

If unit is to be part of an existing system, it is usually best to put it where the old one was. If you plan to change location, you will need additional material as well as an adequate base. The following rules apply not only to replacement boilers, they also apply to new installations:

1. The unit must be level.
2. Use a raised base if floor can become wet or damp.
3. The vent pipe connection should be short. The center of the chim-

ney opening must be high enough to allow a  $\frac{1}{4}$ " per ft. upward slope in vent from unit to chimney opening

4. Maintain clearances for fire safety as well as servicing.

The room must have a total cubic foot volume not less than 16 times that of the boiler.

5. Fresh air for combustion must be available at the front of the boiler.
6. While this boiler may be installed on combustible flooring, it must not be installed on carpeting.
7. The installation must conform to the requirements of the authority having jurisdiction or, in the absence of such requirements, to the national Fuel Gas Code. ANSI Z223.1-Latest Edition.
8. Where required by the authority having jurisdiction, the installation must conform to American Society of Mechanical Engineers Safety Code for Controls and Safety Devices for Automatically Fired Boilers, No. CSD-1.

### Clearance from Combustible Materials

The following minimum clearances are required between boiler and combustible construction:

Top .....	12 inches
Right Side .....	6 inches
Left Side .....	6 inches
Rear .....	6 inches
Flue Connector .....	6 inches
Hot Water Pipe .....	1 inch

Flue and stack must be at least 6" from combustible surfaces.

If hot water pipe passes through combustible floors, walls, or ceilings, clearance must be not less than  $\frac{1}{2}$ " capped with a non-combustible plate (see NFPA bulletin 89M, heating equipment clearance).

Servicing requirements may require larger clearances than those required for fire safety.

As the electrical and piping connections are at the rear of the unit, there should be space to permit access to the rear of the unit for service.

## 4. Combustion Air Requirements

### WARNING

#### Be Sure to Provide Enough Fresh Air for Combustion

You must provide for enough fresh air to assure proper combustion. The fire in the unit uses oxygen. The air in a house contains only enough oxygen to supply the burner for a short time. Outside air must enter the house to replace that used by the burner. Study the following examples to determine your fresh air requirements.

#### EXAMPLE 1: UNIT LOCATION IN UNCONFINED SPACE

If your unit is in an open area in a conventional house, the air that leaks through the cracks around the door and windows will usually be adequate to provide air for combustion. The doors should not fit tightly. Do not caulk the cracks around the windows.

#### EXAMPLE 2: UNIT LOCATED IN A HOUSE HAVING TIGHT CONSTRUCTION

If the house is of tight construction with weatherstripped windows, not enough outside air will enter for safe combustion. Install a duct or pipe from a point near the burner to a ventilated attic or crawl space or the outside where fresh air is freely available. Vertical ducts should have a net free area of 1 square inch for each 4,000 BTU per hour input of all gas appliances and for each 2,000 BTU/hr. if horizontal ducts are used. Screen the openings to keep animals and birds from entering. This is also required if the boiler is installed near an exhaust fan or clothes dryer.

Provisions for combustion and ventilation air in accordance with section 5.3, Air for Combustion and Ventilation, of the National Fuel Gas Code, ANSI Z223.1-Latest Edition, or applicable provisions of the local building codes.

## 5. Vent Pipe Connections

### Check Your Chimney

This is a very important part of your

heating system. It must be clean, the right size, properly constructed and in good condition. No boiler can function properly with a bad chimney. If your chimney is just big enough for your new boiler, it will not have extra capacity for other gas appliances.

When two or more appliances are vented into the same chimney, the cross-section area inside the chimney must be at least equal to the area of the largest vent PLUS  $\frac{1}{2}$  the area of each additional vent.

For example, if your boiler vent has a diameter of 5 inches (area 19.6 square inches), the water heater vent, a diameter of 4 inches (12.6 square inches), the minimum chimney area must be  $19.6 + \frac{1}{2}$  of 12.6 or 25.9 square inches. They will require a 6" diameter round chimney.

When removing a boiler from a common venting system the venting system is likely to be too large for proper venting of the remaining appliances connected to it.

At the time of removal of an existing boiler, the following steps shall be followed with each appliance remaining connected to the common venting system placed in operation, while the other appliances remaining connected to the common venting system are not in operation.

- (a) Seal any unused openings in the common venting system.
- (b) Visually inspect the venting system for proper size and horizontal pitch and determine there is no blockage or restriction, leakage, corrosion and other deficiencies which could cause an unsafe condition.
- (c) Insofar as is practical, close all building doors and windows and all doors between the space in which the appliances remaining connected to the common venting system are located and other spaces of the building. Turn on clothes dryer and any appliance not connected to the common venting system. Turn on any exhaust fans, such as range hoods and bathroom exhausts,

so they will operate at maximum speed. Do not operate a summer exhaust fan.

(d) Place in operation the appliance being inspected. Follow the lighting instructions. Adjust thermostat so appliance will operate continuously.

(e) Test for spillage at the draft hood relief opening after 5 minutes of main burner operation. Use the flame of a match or candle, or smoke from a cigarette, cigar or pipe.

(f) After it has been determined that each appliance remaining connected to the common venting system properly vents when tested as outlined above, return doors, windows, exhaust fans, fireplace dampers and any other gas burning appliance to their previous conditions of use.

(g) Any improper operation of the common venting system should be corrected so the installation conforms with the National Fuel Gas Code, ANSI Z223.1-Latest Edition. When resizing any portion of the common venting system, the common venting system should be resized to approach the minimum size as determined using the appropriate tables in Appendix G in the National Fuel Gas Code, ANSI Z223.1-Latest Edition

### Connect the Vent Pipe

#### WARNING

NEVER INSTALL A MANUALLY OPERATED DAMPER IN THE VENT PIPE OF ANY GAS APPLIANCE.

1. Do not modify draft diverter furnished with the boiler.
2. Vent pipe must be same size as outlet collar on draft diverter.
3. Slope pipe up from boiler to chimney not less than  $\frac{1}{4}$ " per foot.
4. Run pipe as directly as possible with as few elbows as possible.
5. Do not connect to fireplace flue.
6. The sections of vent pipe should be fastened with sheet metal screws to make the piping rigid. Use stovepipe wires to support the pipe from above.

### Minimum Vent Pipe Clearance

If the vent pipe must go through a crawl space, double wall vent pipe should be used. Where vent pipe passes through a combustible wall or partition, use a ventilated metal thimble. The thimble should be 4 inches larger in diameter than the vent pipe. If boiler is installed with a single wall galvanized type vent, it must have 6" clearance between its surface and any combustible material. If Underwriters Laboratories listed type B (insulated vent pipe) is used, clearance between it and combustible material to be as listed.

In lieu of thimble protection, all combustible material in the wall shall be cut away from the vent pipe a sufficient distance to provide the clearance required from vent pipe to combustible material. Any material used to close up such opening shall be non-combustible.

For boilers for connection to gas vents or chimneys, vent installations shall be in accordance with Part 7, Venting of Equipment, of the National Fuel Gas Code, ANSI Z223.1—Latest Edition, or applicable provisions of the local building codes.

### Automatic Vent Damper

The GA100 Series of boilers are fitted with an integral vent damper which is operated by an actuator mounted on the front panel (See Fig. 1).

The stack damper should be checked for alignment and freedom of operation prior to installation and during subsequent routine service.

## 6. System Piping

### Boiler

Place the boiler in a selected location (as near chimney as possible). Your boiler is shipped assembled. You need only to install a ¾" relief valve drain line. Run a pipe from the relief valve outlet to an open drain, tub or sink, or other suitable drainage point not subject to freezing. Failure to do so may cause water damage or injury should the relief valve open. Pipe must be same size as outlet and open end

must not be threaded.

Connect supply and return lines to boiler. The connections may require certain additional fittings and parts as shown on Fig. 2.

If you are replacing an old boiler with this new one, possibly all you will need to do is to connect the existing piping to your boiler.

If you are installing an entire new heating system, first install all of your radiation units (panels, radiators, or cabinets) and the supply and return mains—then make the connection to the boiler.

When connecting the cold water supply to the water valve, make sure that a clean water supply is available. When the water supply is from a well or a pump, a sand strainer should be installed at the pump.

When boiler is used in connection with refrigeration systems, it shall be installed so that the chilled water is piped in parallel with the heating boiler with appropriate valves to prevent the chilled water from entering the heating system boiler.

The boiler piping system of a hot water heating boiler connected to heating coils located in air handling units where they may be exposed to refrigerated air circulation must be equipped with flow control valves or other automatic means to prevent gravity circulation of the boiler water during the cooling cycle.

NOTE: A hot water boiler installed above radiation level must be provided with a low water cutoff device at the time of boiler installation.

It is recommended that the boiler be installed with gate valves on the supply and return lines so that it may be removed for service without draining the entire system. The gate valve on the supply pipe must not be located between the boiler and the relief valve or expansion tank.

### Water Heater

The relief valve and drain valve for the flow and for the hot water tank (Fig. 2) are packed in separate boxes and mount directly to the flow and return.

If the selected temperature at the temperature control (Fig. 1, No. 1) is in excess of 125°F a mixing valve should be installed to minimize the danger of scalding.

## 7. Gas Supply Piping

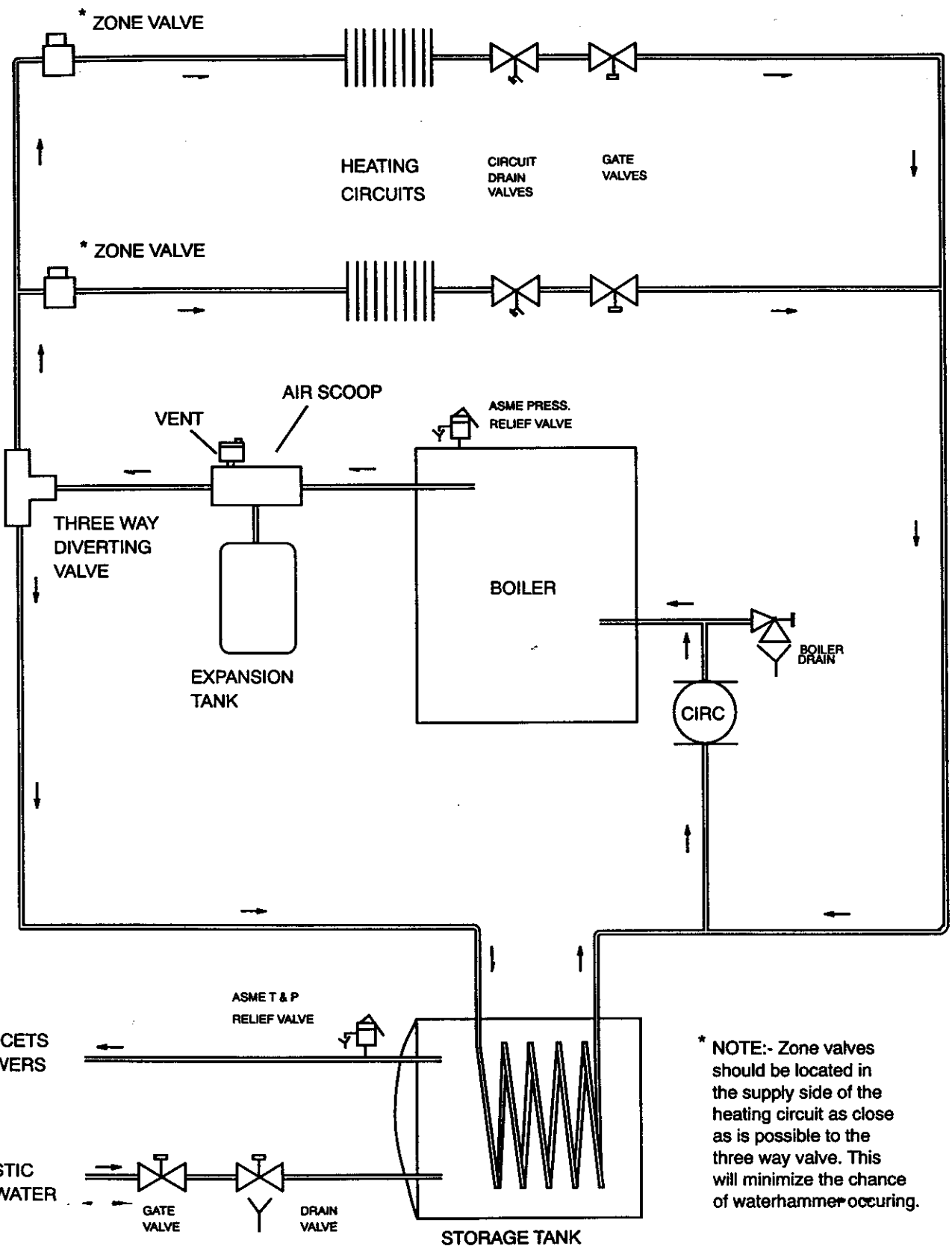
INSTALL GAS PIPING AS OUTLINED IN THE AMERICAN NATIONAL STANDARD ANSI Z223.1-1984—NATIONAL GAS FUEL CODE FOR U.S.A. INSTALLATIONS

The gas pipe to your boiler should run direct from the gas meter (or propane regulator). It should supply only the boiler. It must be the correct size for the length of the run and the boiler rating. See Fig. 3 for the proper size. Be sure your gas line complies with local codes and the gas company requirements.

### Connecting the Gas Piping

Refer to Fig. 1 for the general layout at the boiler. It shows the basic fittings you will need. The gas line enters the boiler from the back. The following rules apply:

1. Use new, properly cleaned black iron piping and fittings, free from chips.
2. Apply good quality pipe dope to pipe only, leaving 2 end threads bare.
3. Install a sediment trap to trap dirt and moisture before it can enter the boiler.
4. Install a manual shut-off valve in vertical pipe about 5 feet above, floor (not supplied by Vaillant).
5. Tighten all joints securely.
6. Propane gas connections should only be made by a licensed propane installer.
7. The boiler and its individual shut-off valve must be disconnected from the gas supply piping system during any pressure testing of that system at test pressures in excess of ½ psig.
8. The boiler 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 pressure equal to or less than ½ psig (3.5KPa).



\* NOTE:- Zone valves should be located in the supply side of the heating circuit as close as is possible to the three way valve. This will minimize the chance of waterhammer occuring.

CAUTION: When storage tank is above 125°F a mixing valve should be installed to minimize the chance of scalding.

Fig. 2 - Typical Piping Arrangements

## Checking the Gas Piping

Upon completion of piping, check right away for gas leaks. Open the manual shut-off valve. Test for leaks by applying soap suds (or a liquid detergent) to each joint. Bubbles foaming indicate a leak.

**CORRECT EVEN THE SMALLEST LEAK AT ONCE.**

### WARNING

**NEVER USE A MATCH OR OPEN FLAME TO CHECK FOR LEAKS.**

NATURAL GAS				
LENGTH OF PIPE - FT.	PIPE CAPACITY CUBIC FEET/HOUR			
	½"	¾"	1"	1½"
20	74	150	280	580
40	50	100	195	400
60	40	84	155	320
80	34	72	135	275

Fig. 3 - Gas Pipe Capacities

MODEL GA100 CS	-60	-80	-100
Elevation			
Sea level to 2,000 ft.	38	42	38
2,000 to 5,000 ft.	40	43	41
5,000 to 7,000 ft.	41	44	42
7,000 to 9,000 ft.	42	46	43
9,000 to 10,000 ft.	43	47	44

Fig. 4 - Orifice Size for Natural Gas

MODEL GA100 CS	-60	-80	-100
Elevation			
Sea level to 2,000 ft.	52	53	52
2,000 to 5,000 ft.	53	55	53
5,000 to 7,000 ft.	53	55	53
7,000 to 9,000 ft.	55	56	54
9,000 to 10,000 ft.	55	56	54

Fig. 5 - Orifice Size for Propane (LPG)

## Orifice Sizing

All Vaillant GA100 CS series units are factory equipped with orifices sized for installation at elevations ranging from sea level up to 2,000 feet. For higher elevations, smaller orifices are required to assure safe operation. Order the proper orifices from your supplier and install them

before turning boiler on. See Figs. 4 & 5.

## 8. Electrical Wiring

### Install Your Thermostat.

The thermostat location has an important effect on the operation of your boiler system. **BE SURE TO FOLLOW THE INSTRUCTIONS INCLUDED WITH YOUR THERMOSTAT.**

Locate the thermostat about five feet above the floor on an inside wall. It may be mounted vertically on the wall or on a vertically mounted outlet box. It should sense average room temperature, so avoid the following:

Dead Spots:

1. Behind doors
2. Corners and alcoves

Hot Spots:

1. Concealed pipes
2. Fireplaces
3. TV sets
4. Radios
5. Lamps
6. Direct sunlight
7. Kitchens

Cold Spots:

1. Concealed piping or ducts
2. Stairwell drafts
3. Door drafts
4. Unheated rooms on other side of wall

## Control Wiring Diagrams

### Field Wiring and Wire Replacement

In the following wiring diagrams dashed lines - - - - represent factory wiring 24V; dashed lines ▲▲▲ represent field wiring 24V; solid lines ——— represent factory wiring 120V; solid lines ▲▲▲▲ represent field wiring 120V.

Field wiring, whether for a new installation or to replace damaged field or factory installed wiring, must be the type listed below, and must be installed in accordance with the National Electric Code and all other codes and standards covering the boiler installation.

## 120-Volt Wiring

All new and replacement wiring must be U.L. listed and 14-gauge size (minimum). Install wire in approved conduit. All terminals and splices must be in a listed covered box.

If an external electrical source is utilized, the boiler, when installed, must be electrically ground in accordance with the requirements of the authority having jurisdiction or, in the absence of such requirements, with the National Electrical Code, ANSI/NFPA No. 70-Latest Edition.

### 24-Volt (Low Voltage) Wiring

Use listed low-voltage cable. All junctions must be clean, joined firmly, and suitably covered with electrical tape or approved wire connectors.

## 9. Flame Roll Out

The GA100 CS Series is equipped with a Flame Roll-Out Safety Shut-Off System. The system is designed to shut off the boiler if a blockage occurs in the heat exchanger that causes flames to roll-out the bottom of the burner tray. Temperature activated switch is located on a bracket next to the pilot or ignitor on the underside of the burner tray.

When corrective action has been taken to eliminate the restriction the pre-set switch has to be replaced with a Vaillant supplied replacement.

## 10. Blocked Vent System

The GA100 CS Series is equipped with a "Blocked Vent Shut-Off System". This system relies on a temperature sensitive switch located on the side of the draft hood. If the vent pipe or chimney should become obstructed to the point of not completely evacuating the flue gases, the switch will break and close down the unit.

When the vent or chimney restriction has been removed, the switch can be reset.

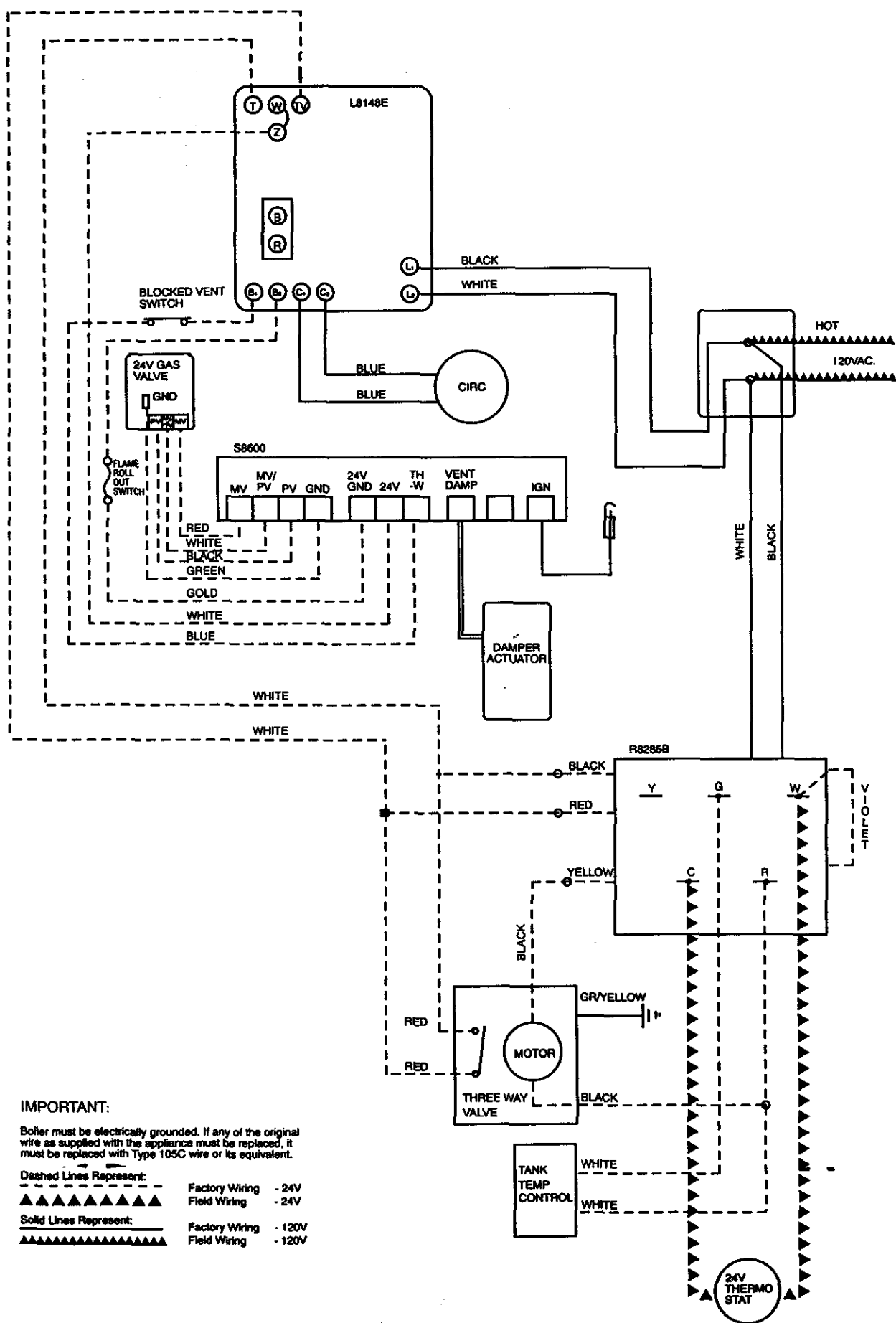


Fig. 6 - 24 Volt Intermittent Pilot System - Field Wiring Diagram



## 11. Checkout Procedures

### Test for Any Gas Leaks

Inspect carefully all gas connections for gas leaks before lighting burner. Do not check for leaks with an open flame.

Test for leaks with a soap solution made of 2 tablespoons of flake, granular, or liquid soap mixed well with ½ cup of warm water and spread generously on connection in question, using a brush or cloth.

### For Your Safety Read Before Operating

#### 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 is equipped with an ignition device which automatically lights the burners. Do not try to light the pilot by hand.
- B. Before operating 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 electric 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.

### Operating Instructions

1. STOP! READ THE SAFETY INFORMATION.
2. Set room thermostat to lowest temperature.
3. Turn off electric power.
4. Turn gas cock knob clockwise and turn to OFF. Wait five minutes, then turn knob to latch position at ON.
5. Turn on electric switch. Burner should turn on when thermostat is set above room temperature.

### Reset Ignition System

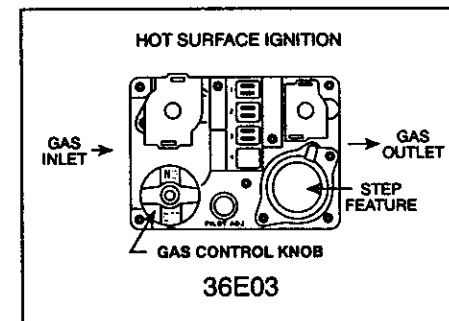
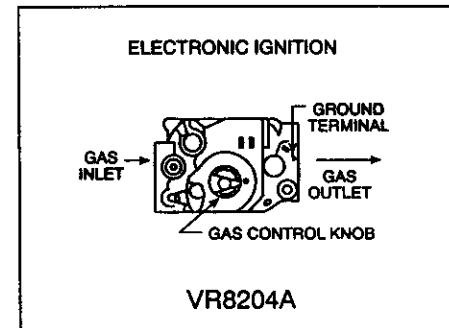
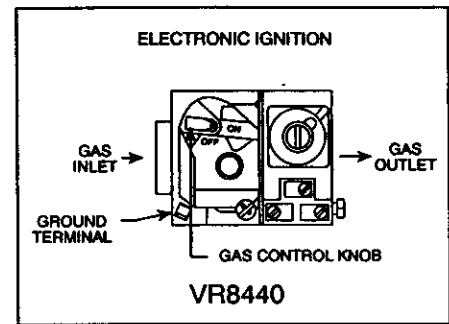
1. Turn the thermostat to the low end of its temperature range.
2. Turn the electric switch to the OFF position.
3. Wait 5 minutes, then turn the system switch to ON position set the thermostat at least 4°F (2.2°C) above room temperature. The boiler should start. If the above steps do not start the pilot and main burner, call your gas appliance service technician, do not attempt to light manually.

### To Turn Off Gas To Appliance

1. Set the thermostat to lowest setting.
2. To shut off burner manually, turn gas cock knob clockwise and turn to OFF position.
3. Turn off electric switch.

### Adjustment of Gas Input—Natural Gas

To check for proper flow of gas into combustion chamber, determine the BTU/hr. input from the instruction plate on the jacket. Divide this input by the BTU per cubic foot of available gas to get the required number of cubic feet of gas per hour.



Determine flow of gas through the gas meter for 2 minutes and multiply by 30 to get the hourly flow rate. Turn off all other gas equipment connected to meter when making this test.

Manifold pressure should be set to about 4" W.C. for natural gas. Small variations in gas flow may be made by means of the gas pressure regulator adjustment. However, the final manifold pressure setting should not vary more than plus or minus 0.3" from the 4" valve. Any necessary major changes in the flow should be made by changing the size of the burner orifice.

## Safety Check of Controls

After boiler has been hooked up and is ready for operation, a few simple checks should be made to be sure all controls are functioning properly.

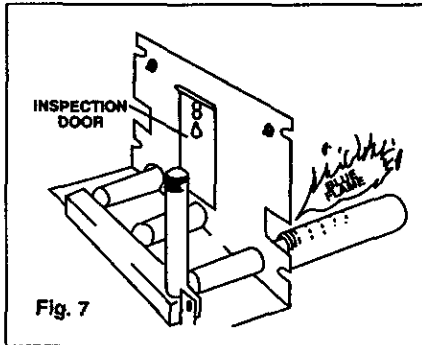
1. Thermostat—Turn thermostat to highest setting. This should turn on the main burner. Adjust heat anticipator to proper current draw.
2. Thermocouple—The pilot lights the main burner on demand and provides a safety feature through either a single couple thermocouple or multiple couple thermocouple which is placed in the pilot flame. These thermocouples generate a small amount of electricity which permits the valve to open only when the pilot is burning. To check the thermocouple for safe operation, ignite the main burner, then disconnect the thermocouple lead. The main burner should shut off.
3. Limit—The limit turns off the burner when the boiler water temperature reaches the temperature setting of the limit. To check this, set the limit at a lowest setting and let the burner run until the limit turns it off. Raise temperature setting of limit. This should turn on burner.

## Relief Valve

You have a safety relief valve on your boiler. It will automatically open at 30 psig pressure. This will relieve the strain on the boiler and system. Run a pipe from the relief valve outlet (pipe must be same size as outlet and open end must not be threaded) to an open drain, tub or sink, or other suitable drainage point not subject to freezing. Failure to do so may cause water damage or injury should Relief Valve release.

## Main Burner

The main burner flame can be observed through the inspection door (Fig. 7). The flame should be translucent and blue in color. The presence of any yellow streaking would indicate the presence of dust or lack of primary air. A vacuum cleaning of the burner tray and combustion area is indicated.



## Checks for Electronic Ignition

The probe lead connections to sensing probe and control terminal must be secure. Electrodes should have a spark gap of  $\frac{1}{8}$ ". If the pilot burner does not ignite, check to see that all connections are proper.

Observe presence of spark. If spark is not present, determine if power is available to the control. The ignition control should be replaced if, with power applied and spark gap properly set at  $\frac{1}{8}$ ", sparking does not occur. If pilot gas does not light even though a spark is present, gas is not available at the pilot burner or the gas pressure is too low or high. If pilot ignites, but burner does not, check probe lead connections to the sensing probe and control. Do not attempt to field repair the control. Replace defective controls.

## 12. Maintenance Requirements

CLEANING MUST INCLUDE PERIODIC EXAMINATION OF VENTING SYSTEMS. ALL FLUE GAS PASSAGEWAYS FROM BOILER TO CHIMNEY AND THE CHIMNEY ITSELF SHOULD BE INSPECTED AND CLEANED IF NECESSARY. THIS SHOULD BE PERFORMED AT LEAST ONCE A YEAR, PRIOR TO THE STARTING OF THE HEATING SEASON.

1. Brush entire surface of all flues using a long handled wire brush. Remove all soot, rust and scale found. Inspect with a flashlight to see that all flueways are completely open. Remove soot and dirt from bottom of boiler.
2. Inspect the flue cover, draft diverter, and smokepipe and replace unserviceable parts, clean all soot, rust or scale from these parts and from chimney. Clean the burners; use a soap solution if necessary.

**CAUTION:** If it becomes necessary to remove the draft diverter, it must be resealed to the casting using new sealant to be sure no fumes can escape.

3. Reassemble all parts and start the boiler following the installation instructions. Carefully inspect fire above each burner for a stable and blue flame. Carbon monoxide poisoning can be caused by yellowish unstable (wavy) flame.

### Burner Cleaning

Burners should be inspected after each boiler cleaning. Slots (ports) can be brushed free of dirt and lint with a stiff bristle brush. Do not damage metal at ports. The pilot and thermocouple or pilot generator should be brushed free of dirt. Take care not to damage pilot, bend it out of position, or to plug pilot gas port.

### Maintained Inspection

The homeowner and service personnel must, at all times, be alerted for these items:

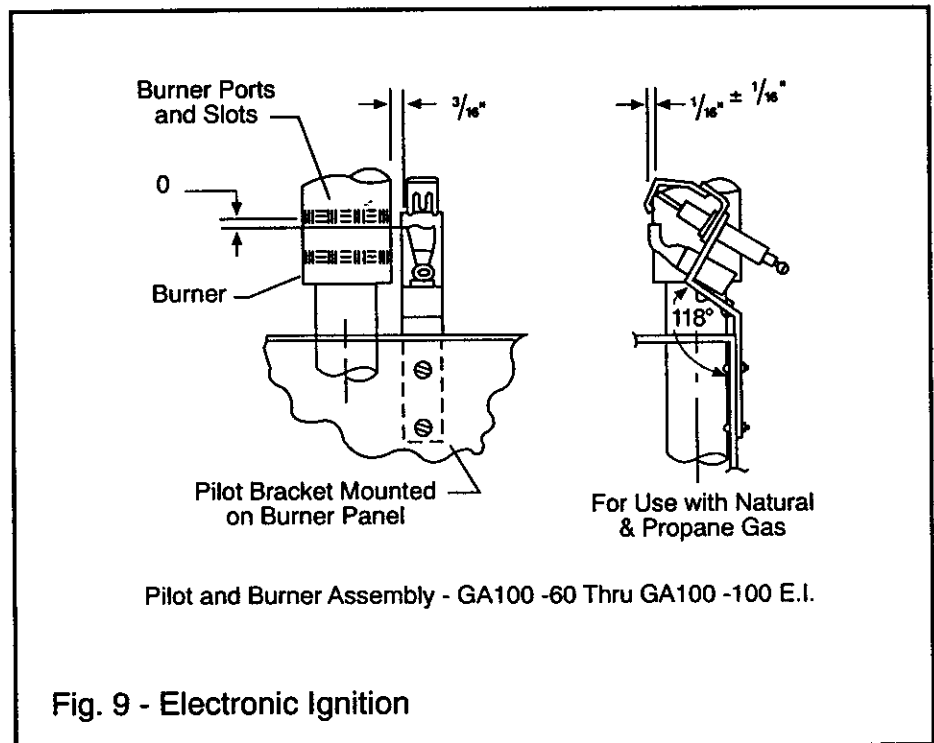
1. Gas odor.
  - a) Open the windows.
  - b) Do not touch any electrical switch.
  - c) Extinguish any open flame, if possible.
  - d) Shut off the main gas valve.
  - e) Call the gas supplier.
2. Excessive heat, odors, smoke, unusual noise. Shut off gas to all appliances and call gas supplier or Fire Department and service organization.
3. Keep area around the boiler clean and free from combustible materials, gasoline and other flammable vapors and liquids.
4. Make allowances and maintain free flow of combustion and ventilating air.

### Freeze Protection

If the boiler is taken out of service during potentially freezing weather, always **DRAIN IT COMPLETELY** since any water left in the boiler or pipes can freeze and cause damage. Be sure to open drain cocks on the wet legs of the left and right castings, see Fig. 1.

### Pilot and Burner

Check for proper pilot flame as explained in "Checkout Procedures" on page 9.





Vaillant Corp.  
2605-07 River Road  
Cinnaminson, NJ 08077  
(609) 786-2000