Series PDE

Gas Boilers

As an ENERGY STAR® Partner, Peerless Heater Company has determined that this product meets the ENERGY STAR® guidelines for energy efficiency.

Installation, Operation & Maintenance Manual

Read carefully, study the control folder and consult drawings before beginning work.

This boiler must be installed by a qualified contractor.

The boiler warranty can be voided if the boiler is not installed, maintained and serviced correctly.

– IMPORTANT –

THIS IS AN INDUCED DRAFT BOILER WHICH HAS SPECIAL VENTING REQUIREMENTS AND MUST BE INSTALLED IN ACCORDANCE WITH SECTION "F" IN THIS INSTALLATION MANUAL. DO NOT VENT THIS BOILER INTO ANY OTHER VENTING SYSTEM OR CHIMNEY.

The equipment shall be installed in accordance with those installation requirements of the authority having jurisdiction or, in the absence of such requirements to the current edition of the National Fuel Gas Code ANSI Z223.1/NFPA 54.

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. ANSI/ASME CSD-1.

A — ACCESSIBILITY CLEARANCES

1. To provide for reasonable conditions of accessibility, the following minimum clearances are recommended.

   a. 24" between the sides, top and front of the boiler and adjacent wall or other appliance, when access is required for servicing.

B — CLEARANCE FROM COMBUSTIBLE CONSTRUCTION

1. This boiler is design certified for the following standard clearances:

   a. Design certified for closet installation.

   b. 1" between combustible construction and flue connector.

   c. 6" between combustible construction and top, sides, rear and front of jacket.

   d. 6" from hot water pipes.

2. This boiler is DESIGN CERTIFIED for installation on combustible flooring with one exception.

   WARNING: UNIT MUST NOT BE INSTALLED ON CARPETED FLOORS.

C — AIR FOR COMBUSTION AND VENTILATION

1–Be certain adequate facilities are available to provide air for satisfactory combustion and ventilation.

2–Appliances Located in Unconfined Spaces:

a. Installations in unconfined spaces with conventional construction and larger areas; the supply of air for combustion and ventilation can usually be considered adequate.

3–Appliances Located in Confined Spaces:

a. If all air for combustion and ventilation is to come from within the building; two openings shall be provided with one opening commencing within 12 inches of the top and one opening commencing within 12 inches of the bottom of the enclosure. These openings shall not be located closer than 3 inches from either the top or bottom of the enclosure and shall be open into areas communicating freely with the outdoors. The area of each opening shall be equal to one square inch per 1000 BTU/HR of total input rating of all appliances within the enclosure; with a minimum of 100 square inches for each opening.

b. If all air for combustion and ventilation is to come from outside the building; two openings shall be provided with one opening commencing within 12 inches of the top and one opening commencing within 12 inches of the bottom of the enclosure. These openings shall not be located closer than 3 inches from either the top or bottom of the enclosure and shall communicate directly or by ducts with the outdoors. The area of each opening shall be equal to one square inch per 4000 BTU/HR of total input rating. If ducts are used to convey the air, vertical ducts require areas of one square inch per 4000 BTU/HR; horizontal ducts require one square inch per 2000 BTU/HR. Ducts shall have the same cross sectional area as the full area of the openings to which they connect.

D — SETTING UP BOILER

1. Separate the wood shipping pallet from the boiler base by removing two (2) hold down bolts at each end of the boiler base.

2. Provide a good level foundation. The boiler should be located as near to the outside wall that it is to be vented through.

E — PIPING

NOTE: THIS BOILER IS PROVIDED WITH A "THERMOSTATIC BY-PASS VALVE" THAT REDUCES THE POSSIBILITY OF CONDENSATION WITHIN THE FLUEWAYS, BY NOT ALLOWING RETURN WATER BELOW 160°F FROM ENTERING THE BOILER. BETWEEN 160°F AND 180°F, SYSTEM WATER FLOWS THROUGH THE BY-PASS LOOP AND THE BOILER. AT 180°F THE THERMOSTATIC ELEMENT IN THE BY-PASS VALVE IS FULLY OPENED ALLOWING ALL WATER TO FLOW THROUGH THE BOILER. REFER TO FIGURE 2.

1. The recommended piping hook up is as follows. Refer also to the Hydronics Institute Installation Guide 2000 and the Peerless Water Survey for additional guidance.

   A. The supply and return piping shall be sized to suite the system.

      a. Supply piping is connected to the 1-1/4" supply tapping located on the "thermostatic by-pass valve."

      b. Return piping shall be piped to inlet connection of the circulator.

   B. The bypass piping shall be installed as shown in Figure 2. The 3/4" x 3/4" female adaptors are furnished with the boiler. The 3/4" copper pipe and 90° elbow are to be supplied by the installer.

   C. Remove the shipping nipple from boiler and install the 3/4" x 9" nipple into the boiler tapping. Thread the 3/4" tee onto this nipple and use the side outlet of the tee to mount the relief valve using a 3/4" street ell and short nipple, supplied with boiler, as shown on dimensional drawing under Section Q.

CAUTION: PIPE THE DISCHARGE OF RELIEF VALVE TO PREVENT INJURY IN THE EVENT OF PRESSURE RELIEF. SUGGEST DISCHARGE TO BE PIPED TO DRAIN. PIPE FULL SIZE OF OUTLET.

NOTE: A HOT WATER BOILER INSTALLED ABOVE RADIATION LEVEL MUST BE PROVIDED WITH A LOW WATER CUTOFF DEVICE, EITHER AS A PART OF THE BOILER OR AT THE TIME OF BOILER INSTALLATION.

NOTE: THIS BOILER SHALL BE INSTALLED SO THAT THE GAS IGNITION SYSTEM COMPONENTS ARE PROTECTED FROM WATER (DRIPPING, SPRAYING, ETC.) DURING APPLIANCE OPERATION AND SERVICE (CIRCULATOR REPLACEMENT, CONDENSATE TRAP, CONTROL REPLACEMENTS, ETC.).

NOTE: IF THIS BOILER AND DISTRIBUTING SYSTEM IS USED IN CONJUNCTION WITH A REFRIGERATION SYSTEM, THE CHILLED MEDIUM SHALL BE PIPED IN PARALLEL WITH THE BOILER AND THE PROPER VALVE APPLIED TO PREVENT THE CHILLED MEDIUM FROM ENTERING THE BOILER. A DRAWING ILLUSTRATING THIS HOOK-UP IS PROVIDED IN FIGURE 1.

NOTE: WHEN THE BOILER IS CONNECTED TO HEATING COILS LOCATED IN AIR HANDLING UNIT WHERE THEY MAY BE EXPOSED TO REFRIGERATED AIR CIRCULATION, THE BOILER PIPING SYSTEM MUST BE EQUIPPED WITH FLOW CONTROL VALVES OR OTHER AUTOMATIC MEANS TO PREVENT GRAVITY CIRCULATION OF THE BOILER WATER DURING THE COOLING CYCLE.

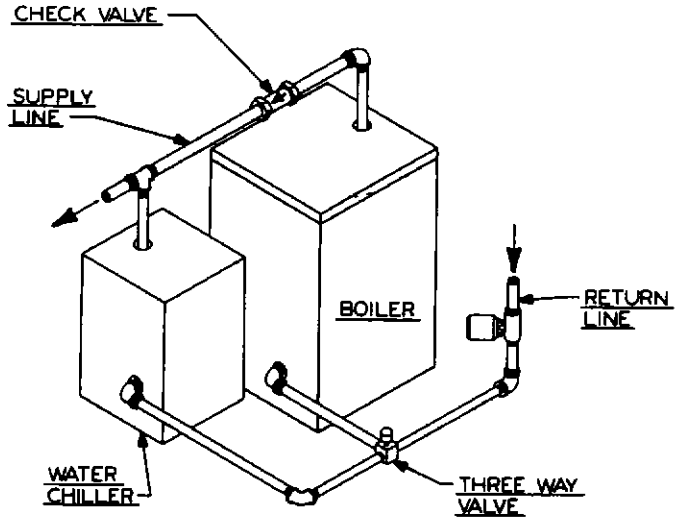


Figure 1

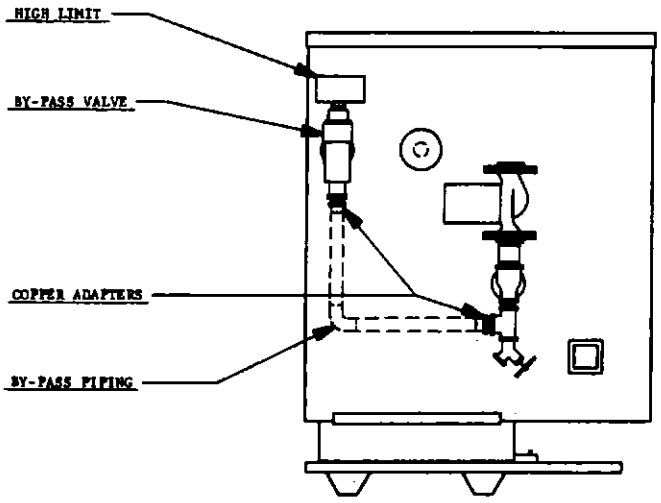


Figure 2

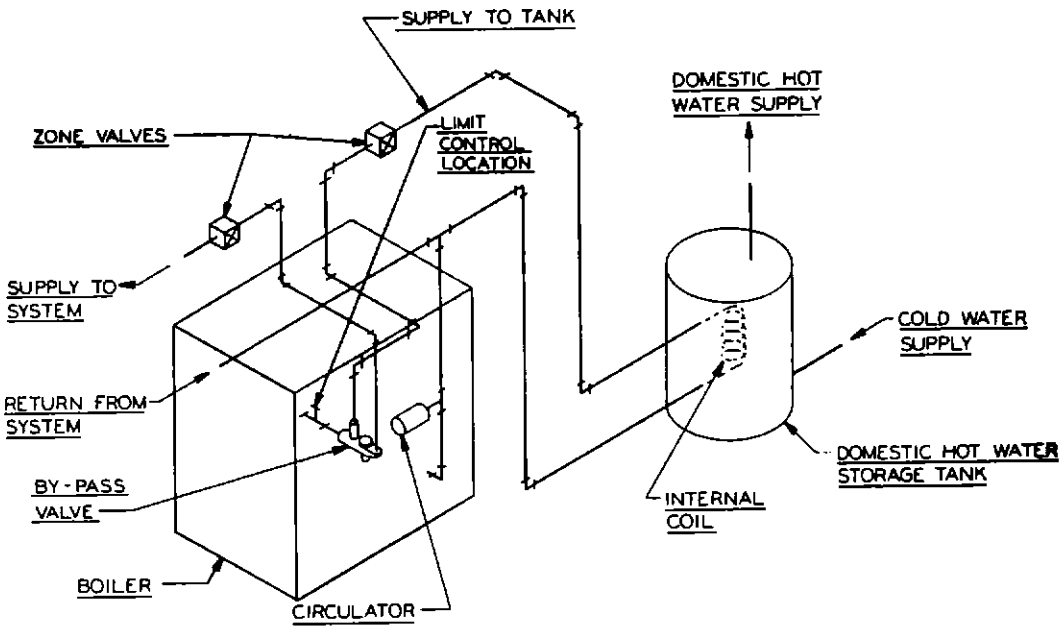


Figure 3

Storage Tank Heater - if the boiler is to be used in conjunction with a storage tank heater refer to Figure 3 for typical piping. Also refer to additional instructions supplied with tank.
Remove limit control from by-pass valve and install in tee at boiler outlet.

CAUTION: WATER MIXING VALVE SHOULD ALWAYS BE INSTALLED IN THE HOT WATER SUPPLY TO PREVENT INJURY.

F — VENT PIPE ASSEMBLY

The following components are supplied with boiler in the miscellaneous parts box:

- Stainless steel condensate drain tee and trap assembly
- Stainless steel vent cap adapter
- Stainless steel vent cap
- Tube of high temp silicone

1. Refer to the Saf-T-Vent Installation Instructions supplied in the boiler folder and section G-Venting of this manual before proceeding with vent pipe assembly. Pay close attention to the "Conduit Installation" portion of Saf-T-Vent Instructions and clean joint with alcohol pad, supplied with vent pipe, before assembling.
2. Use only the stainless steel vent cap and silicone provided.
3. The minimum vent length is 2-1/2 feet and the maximum equivalent vent length is 40 feet. Each 90° elbow has an equivalent length of 5 feet.
4. The condensate drain trap should be filled with water which will provide a seal against products of combustion exiting through the drain assembly. Drain trap can then be piped to drain or a container and discarded accordingly. Do not install drain lines above trap outlet.

NOTE: MAINTAIN VENT OUTLET OF CONDENSATE DRAIN TEE IN VERTICAL POSITION.

NOTE: LOCAL CODES AND ORDINANCES MAY DICTATE SPECIAL REQUIREMENTS FOR THE DISPOSAL OF CONDENSATE.

HEAT FAB SAF-T VENT 3" AL294C STAINLESS STEEL

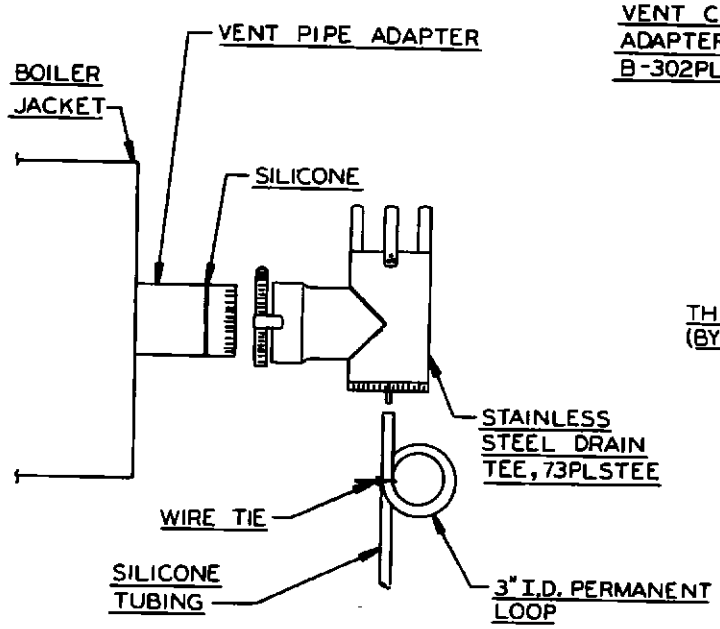


FIG. A

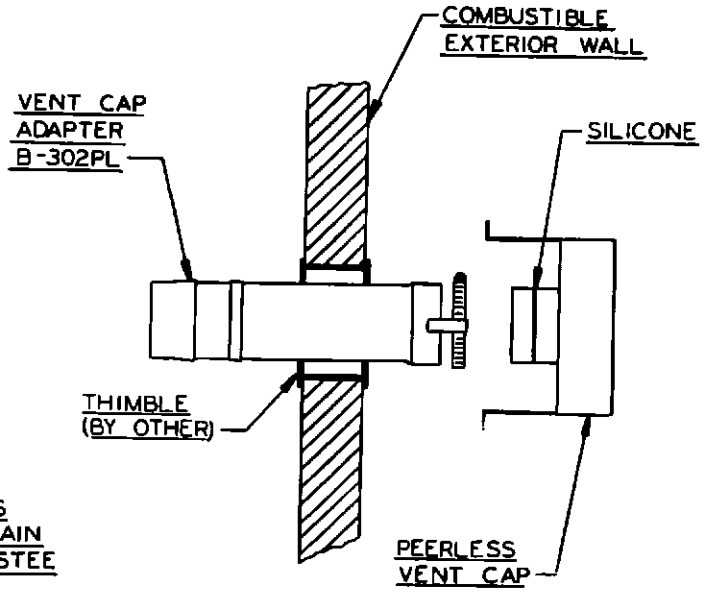


FIG. B

ASSEMBLY INSTRUCTIONS

1. Attach the stainless steel drain tee to the vent pipe adapter by spreading a 1/4" bead of high temp-silicone around the vent pipe adapter and slip tee over adapter. Refer to figure A.
2. Fill in any voids at joint with silicone and smooth out with a moistened finger or flat tool.
3. Tighten hose clamp until snug.
4. Slip the 3/8" I.D. silicone tubing over the drain plug and form a 3" diameter continuous loop with wire tie provided, to create a drain trap.
5. Fill trap with water and pipe to drain or condensate container.
6. Assemble vent pipe per Heat Fab Saf-T-Vent instructions.
7. The vent cap adapter is attached to the Peerless Vent Cap in the same method as in step 1 thru 3 above. Refer to Figure B. Run a bead of silicone down the full length of the seam weld of the vent cap adapter.

Z-FLEX Z-VENT 3" AL294C STAINLESS STEEL

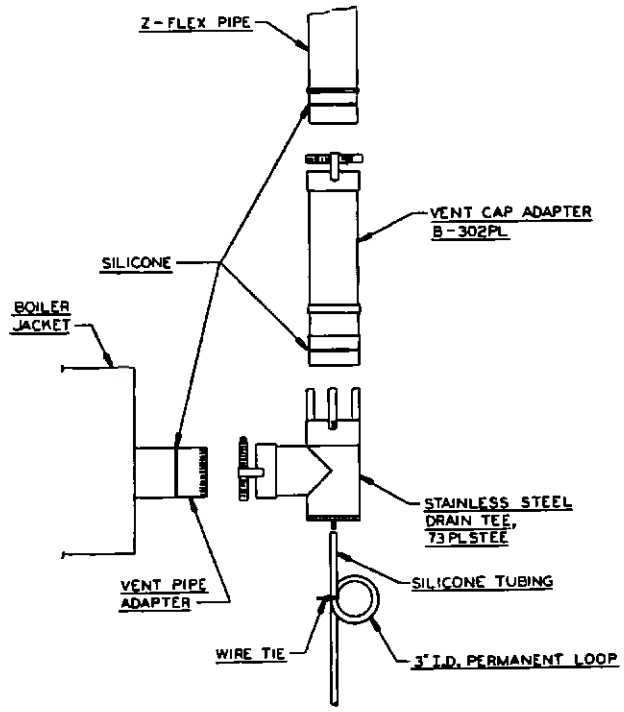


FIG. C

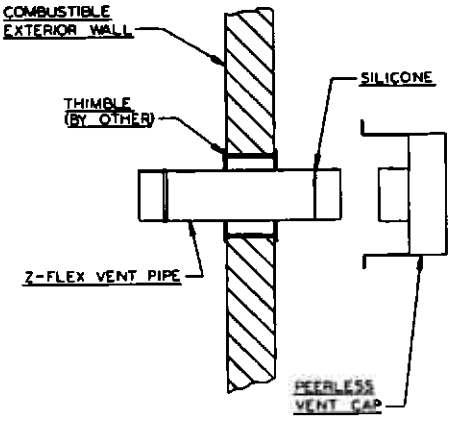
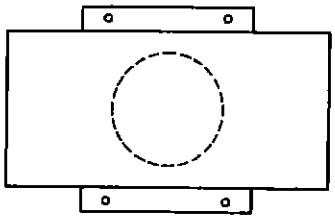


FIG. D

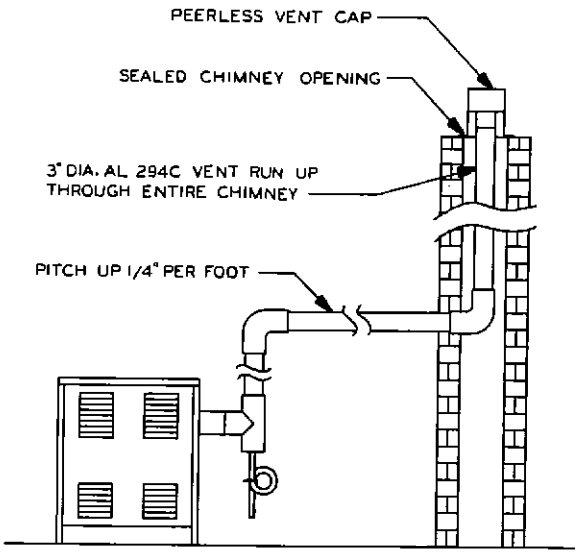
ASSEMBLY INSTRUCTIONS

1. Attach the stainless steel drain tee to the vent pipe adapter by spreading a 1/4" bead of high temp-silicone around the vent pipe adapter and slip tee over adapter. Refer to figure C.
2. Fill in any voids at joint with silicone and smooth out with a moistened finger or flat tool.
3. Tighten hose clamp until snug.
4. Slip the 3/8" I.D. silicone tubing over the drain plug and form a 3" diameter continuous loop with wire tie provided, to create a drain trap.
5. Fill trap with water and pipe to drain or condensate container.
6. Attach vent cap adapter to drain tee by applying a 1/4" bead of high temp silicone around the male end of adapter and also run a bead of silicone down the full length of the adapter seam weld.
7. Fully insert adapter into drain tee and slide the locking ring over the tabs and bend tabs back over locking ring until they contact vent pipe. Fill in any voids at joint as in step 2 above. Refer to Figure C.
8. Attach Z-Vent pipe to vent cap adapter applying 1/4" silicone bead around male end of Z-Vent pipe and fully insert into vent cap adapter. Fill in voids at joint with silicone and tighten hose clamp until snug.
9. Assemble vent pipe as per Z-Flex, Z-Vent instructions.
10. Attach Z-Vent pipe to Peerless vent cap by first cutting off female end of vent pipe.
11. Apply 1/4" bead of high temp silicone around end of vent pipe, (Refer to Figure D), and insert vent pipe into the sleeve of the Peerless vent cap. Fill in voids around joint with silicone.



MOUNTING POSITION FOR SIDEWALL VENTING

Figure 4



RECOMMENDED USE OF CHIMNEY

Figure 5

G — VENTING

NOTE: FLUE GASES WILL CONDENSE AS THEY EXIT THE OUTSIDE VENT CAP. THIS CONDENSATE CAN FREEZE ON EXTERIOR WALLS WHICH MAY CAUSE SOME DISCOLORATION OF EXTERIOR BUILDING SURFACES.

1. Vent connectors serving appliances vented by natural draft shall not be connected into any portion of mechanical draft systems operating under positive pressure.
2. Horizontal portions of the vent pipe shall slope upwards not less than 1/4" per foot from the boiler to the vent terminal. The vent pipe shall also be supported by metal strapping or equivalent means located at no greater than 5 foot intervals.
3. Do not vent into a common chimney. Refer to Figure 5 for routing vent pipe through existing chimney.
4. Do not vent directly through brick or masonry walls without a rust resistant sheet metal backing plate (2 x 2 ft. sq.).
5. When installing vent pipe through a combustible wall, it must pass through a metal thimble allowing at least a 1 inch clearance between the walls of the vent pipe and the metal thimble.
6. Vent pipe, when installed, shall not have any sags which would allow condensate to accumulate.
7. The vent cap shall be located at least 3 feet above any forced air inlet located within 10 feet.
8. The vent cap shall be at least 4 feet below, 4 feet horizontally from, or 1 foot above any door, window, gravity air inlet into any building. The bottom of the vent cap shall be located 1 foot above ground level or normal snow lines.
9. Vent cap shall not terminate over public walkways or over areas where condensate could create a nuisance or hazard.
10. Do not install vent cap above or below electric meters, gas meters, regulators and relief equipment unless a 4 foot horizontal distance is maintained.
11. Vent cap should not be installed directly under roof overhangs to prevent icicles from forming.
12. When an existing boiler is removed from a common venting system, the common venting system is likely to be too large for proper venting of the appliances remaining 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 any clothes dryers 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. Close fireplace dampers.

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

e. Test for spilliage 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 current edition of the National Fuel Gas Code, ANSI Z223.1/NFPA 54. When resizing any portion of the common venting system, the common venting system should be resized to approach minimum size as determined using the appropriate tables located in the chapter "Sizing of Category I Venting Systems," in the current edition of the National Fuel Gas Code, ANSI Z223.1/NFPA 54.

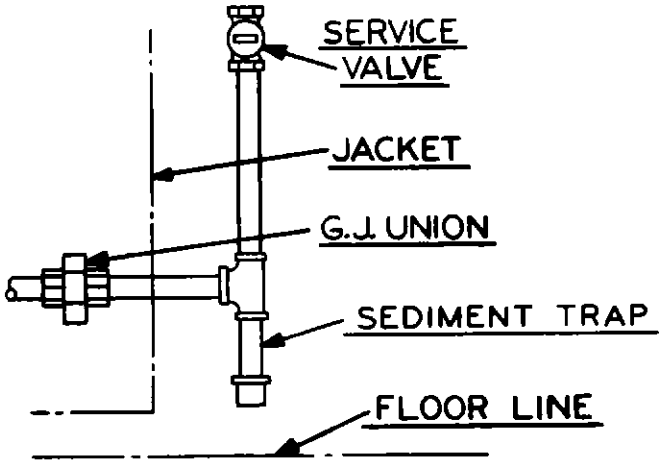


Figure 6

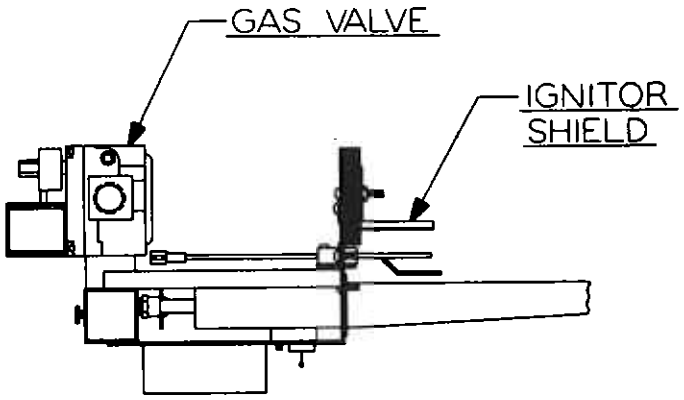


Figure 7

H — GAS PIPING

1. Gas supply piping is to be sized and installed properly in order to provide supply of gas sufficient to meet the maximum demand without undue loss of pressure between the meter and the boiler.
2. Consult the following table for proper sizing of gas piping for various lengths and diameters.

Pipe Length Feet	¾" Pipe	1" Pipe	1¼" Pipe	1½" Pipe
10	278	520	1,050	1,600
20	190	350	730	1,100
30	152	285	590	890
40	130	245	500	760
50	115	215	440	670
60	105	195	400	610

MULTIPLIERS TO BE USED WITH ABOVE TABLE, WHEN THE SPECIFIC GRAVITY OF THE GAS IS IS OTHER THAN 0.60.

Specific Gravity	0.5	0.55	0.60	0.65	0.70
Multiplier	1.10	1.04	1.00	0.962	0.926

4. Locate the drop pipe adjacent to, but not in front of the boiler.
5. Locate a tee in the drop pipe at same elevation as the gas inlet connection to the boiler. Extend the drop pipe to a pipe cap as shown in Figure 6, to form a sediment trap.
6. If boiler is equipped with combination gas controls, install a ground joint union ahead of the gas control assembly to permit servicing of the control. See Figure 6. Some local codes require an additional shut-off valve when using the combination gas controls. If your code requires such a valve, a suggested location is shown in Figure 6.
7. NOTE: When installing boiler, be sure a pipe compound resistant to the action of liquified petroleum is used.
8. Check piping for leaks. Always check leaks with a water and soap solution or equal. DO NOT USE A FLAME FOR CHECKING GAS LEAKS.
9. The boiler and its individual shutoff valve must be disconnected from the gas supply piping system during any pressure testing of that system at test pressure in excess of ½ psig (3.5 kPa).
10. The boiler must be isolated from the gas supply piping system by closing its individual manual shut-off valve during any pressure testing of the gas supply piping system at test pressure equal to or less than ½ psig (3.5 kPa).

I — CONTROLS

1. For proper locations of controls and accessories refer to Section Q "Ratings, Tappings, Locations and Dimensional Date."
2. In the event of control failure, the replacement shall be identical to original equipment.
3. Additional control specifications sheets are in enclosed folder.
4. This boiler is supplied with controls and safety switches that are not found on natural draft fired units. The following is a description of these accessories and how they work in conjunction with the safe operation of the boiler.

   A. Peerless Status Panel — This electronic circuit board controls the operation of the circulator and blower and also provides status indication of the boiler sequence of operation. The six L.E.D. lights are marked as follows:

   1 — "PWR" light indicates there is 115V AC at boiler.

   2 — "T' STAT" light indicates a call for heat by thermostat.

   3 — "H' LMT" light indicates high limit switch is closed.

   4 — "TCO" light indicates flame rollout safety shutoff switch is closed.

   5 — "PS" light indicates pressure switch is closed.

   6 — "MV" light indicates main gas valve is powered.

   The Status Panel is designed to aid the serviceman in troubleshooting boiler operation. The lights are powered in succession through the various limits and switches located in the 24 volt control circuit. If any light is out, the lights below it will also be out. For example: If thermostat calls for heat and the boiler high limit switch is open; lights 3 thru 6 will not be lit.

   An added feature of the status panel is the test switch, located on the outside of the left jacket panel. With line voltage supplied to boiler the "PWR" light is lit. Pressing the test switch powers lights 2-6 only, indicating these lights are functional. The test switch does not control any operating functions of the boiler, so it can be pressed any time during a boiler operating cycle.

   Refer to "Sequence of Operation" Section M.

   B. Pressure Switch — This device senses a negative or suction pressure in the blower housing when the blower is energized. If there is no excessive blockage in the venting system, the switch will close, allowing power to energize the ignition system.

   C. Flame Rollout Safety Shutoff Switch — This is a thermally activated switch that is located on the burner plate manifold, that will sense excessive temperature, caused by continued flame roll-out, and shut down main burner gas.

   This is a non-recycling type switch that must be replaced once it has been activated and the cause of the roll-out eliminated.

   NOTE — Set anticipator setting to .2 amp on thermostat.

J — INSTRUCTIONS FOR OPERATION

1. The installation is not complete until Rating and Lighting Plates are on the boiler and the "Users Information Manual" and "Installation Instructions" are hung near the boiler.
2. System should be maintained in good repair. Radiators, baseboard units and/or convectors must be kept clean.
3. If a radiator does not heat all over, air has probably accumulated and should be vented.
4. Before starting boiler refer to the operating instruction label located on the inner front jacket panel of boiler.
5. The boiler and its gas connections must be leak tested before placing the boiler in operation. Check gas connections with soap solution.

K — ADJUSTMENT TO GAS PRESSURE REGULATOR

1. Set manifold pressure as follows for various gases.

   a. Natural Gas . . . . . .3-1/2" Water Column b. Propane Gas . . . . . .10" Water Column

2. To adjust gas pressure, turn adjusting screw or gas pressure regulator, out to decrease pressure, turn in to increase pressure. Refer to control sheets supplied with boiler for location of gas pressure regulator.

3. In no case should the final manifold pressure vary more than plus of minus 0.3 inches water column from the above specified pressures. Any necessary major changes in the flow should be made by changing the size of the burner orifice.

   Minimum Permissible Supply Pressure For Purposes Of Input Adjustment . . . . . .5" W.C. Nat. Gas 11" W.C. L.P. Gas

   Maximum Permissible Supply Pressure To The Boiler . . . . . .13.5" W.C. Nat. Gas 13.5" W.C. L.P. Gas

L — BURNER INPUT

1. Refer to rating label mounted on the Jacket Top Panel to obtain the required BTU per hour input. In no case shall the input to the boiler exceed that shown on the rating label.

2. Check input by use of the following formula: Suggest reading meter for 2 Cu. Ft.

$$\frac{3600 \times F \times H}{T} = \text{BTU/Hr. Input}$$

3600 — Seconds per hour
F — Cu. ft. Gas Registered On Meter
H — Heat Value of Gas in BTU/Cu. Ft.
T — Time in seconds the Meter is Read

NUMBER OF ORIFICES REQUIRED

Model Number	PDE-03	PDE-04	PDE-05
Orifices	3	5	6

M — SEQUENCE OF OPERATION

The following steps describes the sequence of boiler operation from the initiation of line voltage to the boiler, to the energizing of the main gas valve.

1. With 115V AC connected to L1 and L2 on the "Peerless Status Panel," L.E.D. light PWR on panel is lit.

2. Check to be sure all 24 volt L.E.D. lights are functional by pressing and holding the test switch located on left jacket panel.

3. On a call for heat by the thermostat, the T'Stat L.E.D. is lit.
   - Circulator relay is energized, closing contacts to power the circulator.

4. If high limit is closed, the H'Lmt L.E.D. is lit.

5. If the flame roll-out safety shutoff switch is closed, the TCO L.E.D. light is lit.
   - Blower relay is then energized through the normally closed contacts of the pressure switch, powering the blower.

6. Pressure switch normally OPEN contacts will CLOSE energizing the hot surface ignition control and lighting the PS L.E.D.
   - Hot surface ignition contrl goes through it's ignitor warm-up time and at end of warm-up time energizes the gas valve for the trial for igntion timing of the control.

7. When main gas valve is energized, the MV L.E.D. is lit. If main flame is proven, the boiler will run until thermostat is satisfied. When the thermostat opens, the PWR L.E.D. remains lit and all other lights on the panel will be off.

N — CHECK OUT PROCEDURE

1. After starting boiler, be certain all controls are working properly before leaving it unattended. Check to be sure that the temperature limit control will shut off the boiler in the event of excessive temperature, by lowering limit set point until main burners shut down. Return limit to desired set point.
2. Check gas tightness of main gas valve when closed to be certain there is no leakage to the burners. Check all joints periodically for gas leakage. Use soap solution to check leakage.
3. Check the operation of the ignition system safety shut-off device using the following methods:

Hot Surface Ignition System: With the unit operating, turn off the gas at the inlet shut-off valve upstream from the boiler. The hot surface igniter will glow for a timed warm-up period of approximately forty-five (45) seconds or thirty-four (34) seconds and attempt to relight. If unit is equipped with a retry option, unit will attempt a total of three (3) tries for ignition, after which lock-out will occur and the ignitor will stop glowing. To relight follow "Operating Instructions'.

SHUT DOWN CAUSED BY IGNITOR OUTAGE OR FLAME ROLLOUT SAFETY SHUTOFF SWITCH

1. In the event of shut down caused by an ignitor outage or action of the flame rollout safety shutoff switch effecting a shut down of the main burners, turn off all electric power to boiler, turn gas cock knob to "OFF" position. Call a qualified heating service organization or the local gas company. Have the cause of shut-down investigated and corrected. Boiler can now be re-started. Refer to "Operating Instructions".

NOTE

SHOULD OVERHEATING OCCUR OR THE GAS SUPPLY FAIL TO SHUT-OFF, DO NOT TURN OFF OR DISCONNECT THE ELECTRICAL SUPPLY TO THE PUMP. INSTEAD, SHUT-OFF THE GAS SUPPLY AT A LOCATION EXTERNAL TO THE APPLIANCE.

DO NOT USE THIS APPLIANCE IF ANY PART HAS BEEN UNDER WATER. IMMEDIATELY CALL A QUALIFIED SERVICE TECHNICIAN TO INSPECT THE BOILER AND TO REPLACE ANY PART OF THE CONTROL SYSTEM AND ANY GAS CONTROL WHICH HAS BEEN UNDER WATER.

O — WIRING

NOTE: THIS UNIT WHEN INSTALLED MUST BE ELECTRICALLY GROUNDED IN ACCORDANCE WITH THE REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION OR, IN THE ABSENCE OF SUCH REQUIREMENTS, WITH THE CURRENT EDITION OF THE NATIONAL ELECTRICAL CODE, ANSI/NFPA NO. 70, IF AN EXTERNAL ELECTRICAL SOURCE IS UTILIZED.

1. All electrical wiring shall be done in accordance with The National Electric Code and local requirements.
2. See Figure 8 for location of wiring and controls. For recommended wiring of controls, refer to Figures 9 thru 14.
3. For recommended wiring with zones, refer to Figures 15 and 16.
4. The boiler should be connected by a separate, permanently live electrical supply line with a fused switch.

NOTE: Single pole switches including those of safety controls or protective devices shall not be wired in a grounded line.

CAUTION: LABEL ALL WIRES PRIOR TO DISCONNECTION WHEN SERVICING CONTROLS. WIRING ERRORS CAN CAUSE IMPROPER AND DANGEROUS OPERATION . VERIFY PROPER OPERATION AFTER SERVICING.

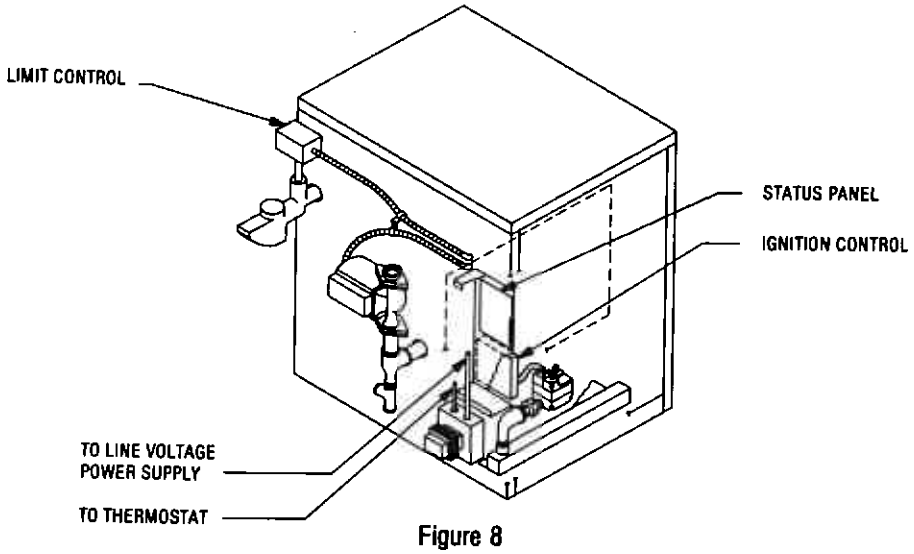


Figure 8

WHITE-RODGERS HOT SURFACE IGNITION

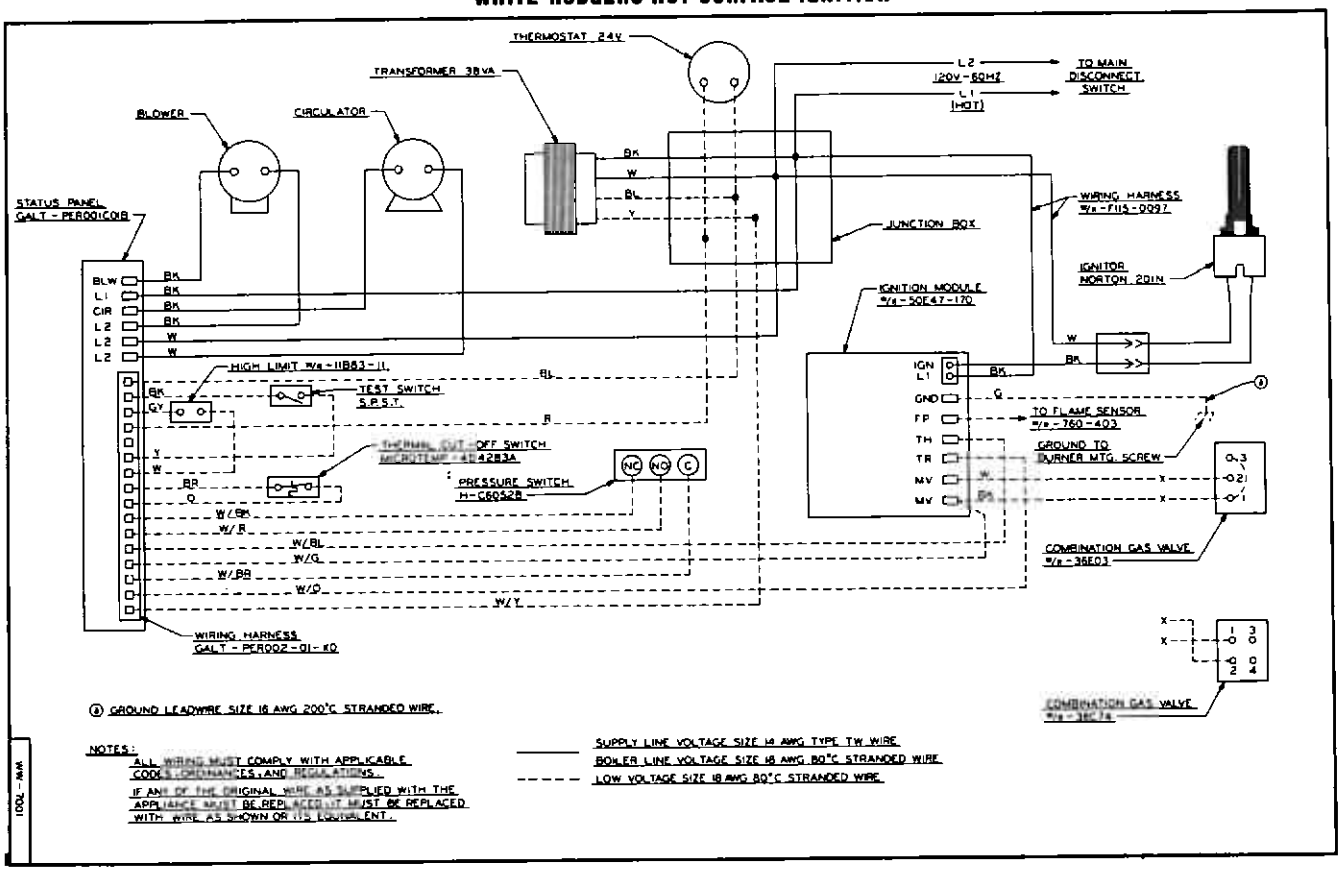


Figure 9

HONEYWELL HOT SURFACE IGNITION

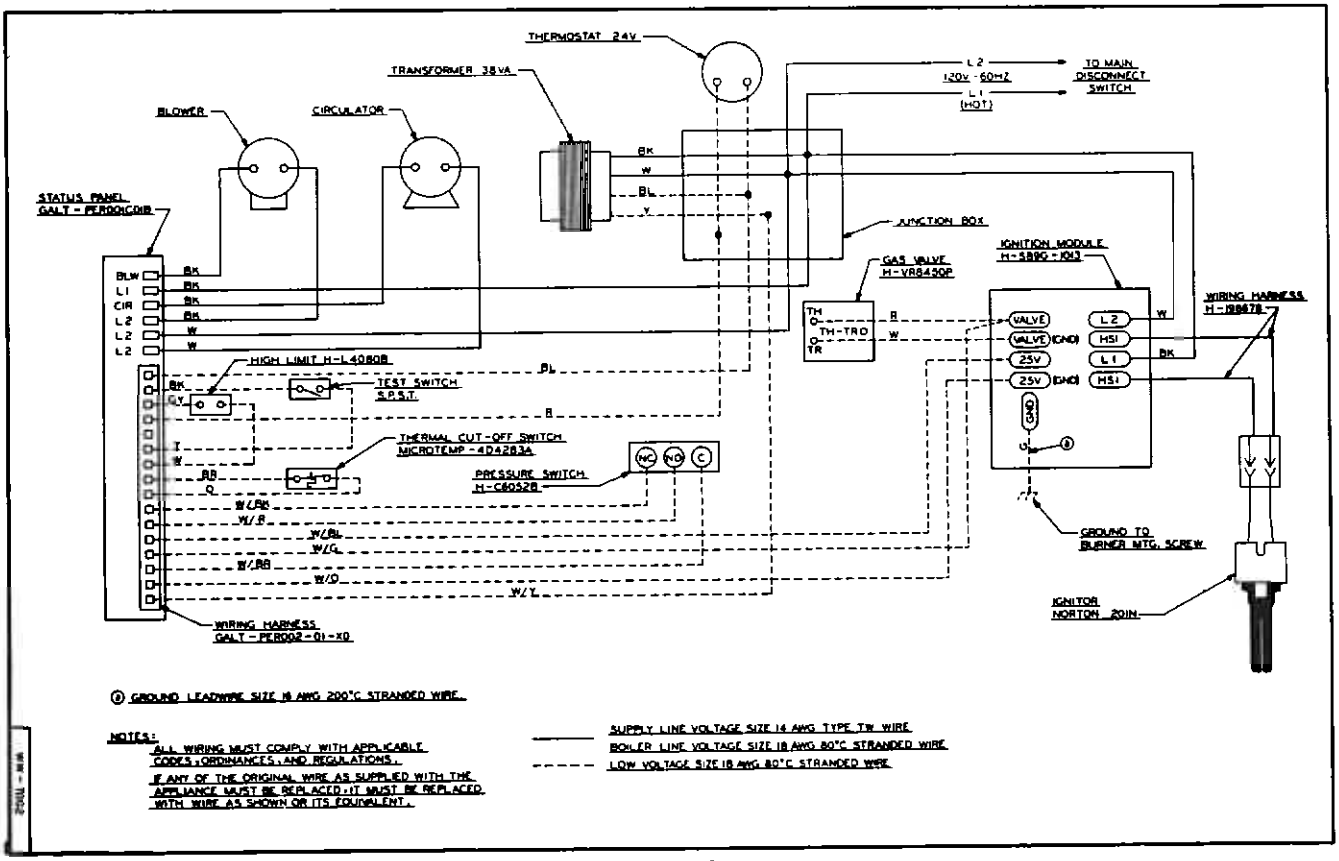


Figure 10

WHITE-RODGERS HOT SURFACE IGNITION

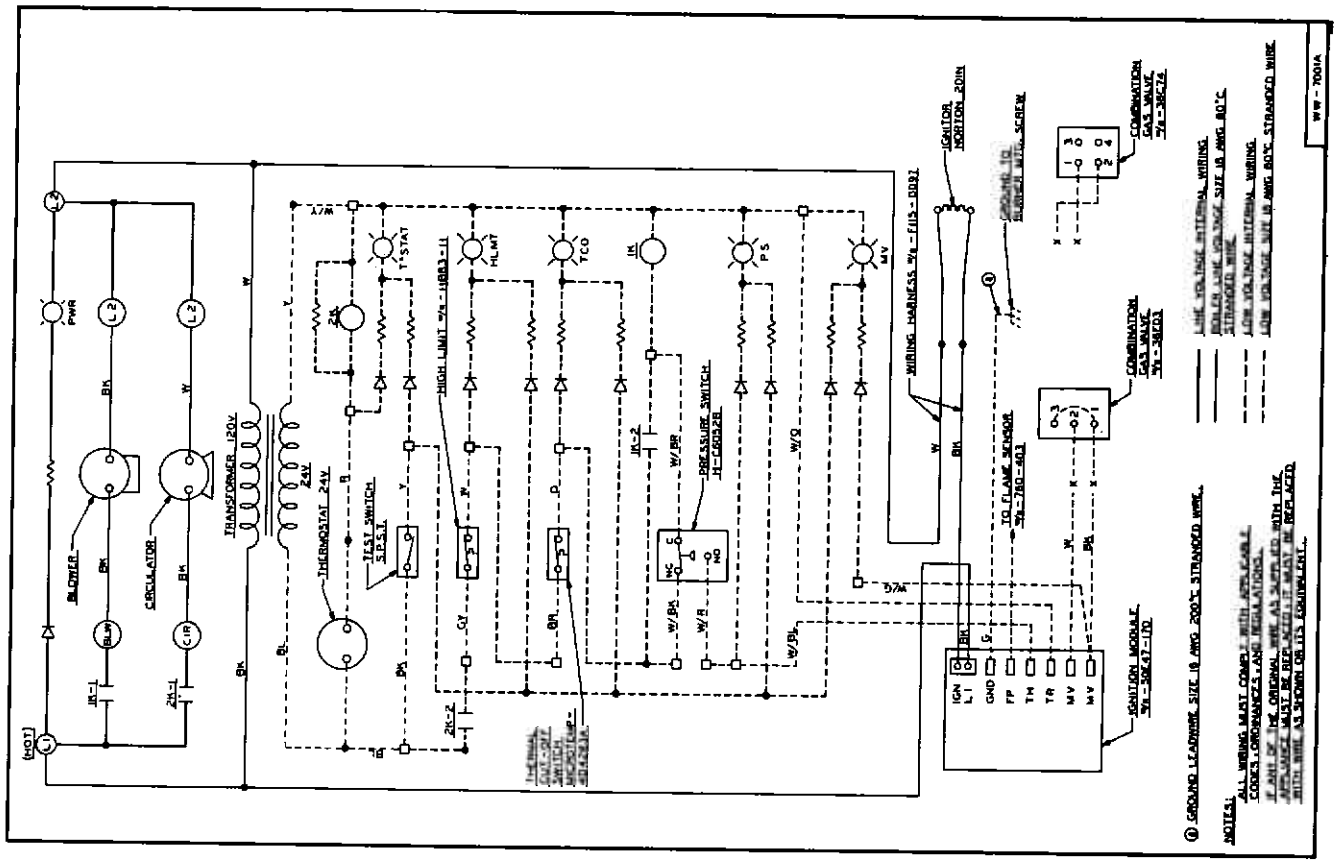


Figure 11

HONEYWELL HOT SURFACE IGNITION

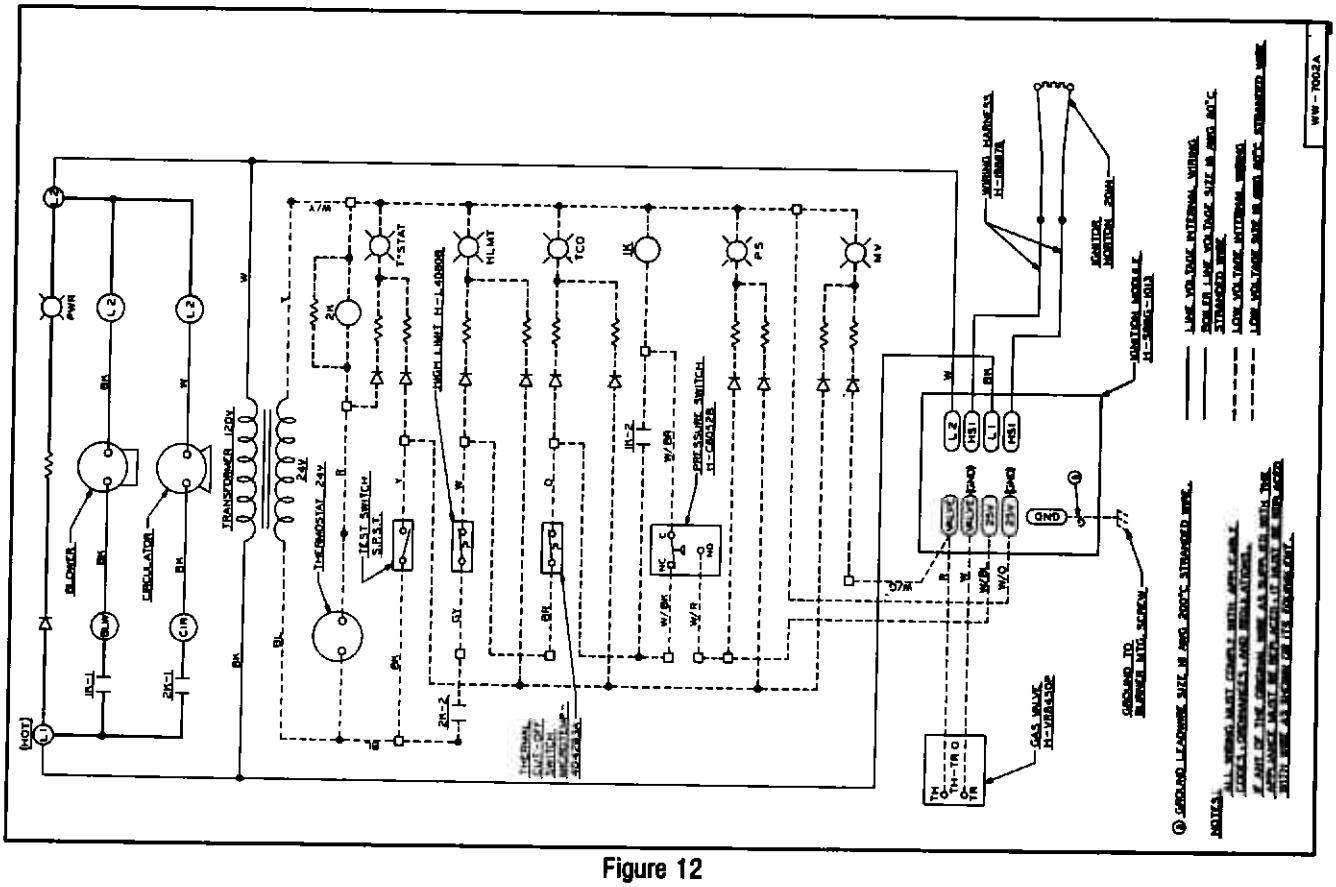


Figure 12

HONEYWELL HOT SURFACE IGNITION W/REMOTE SENSOR

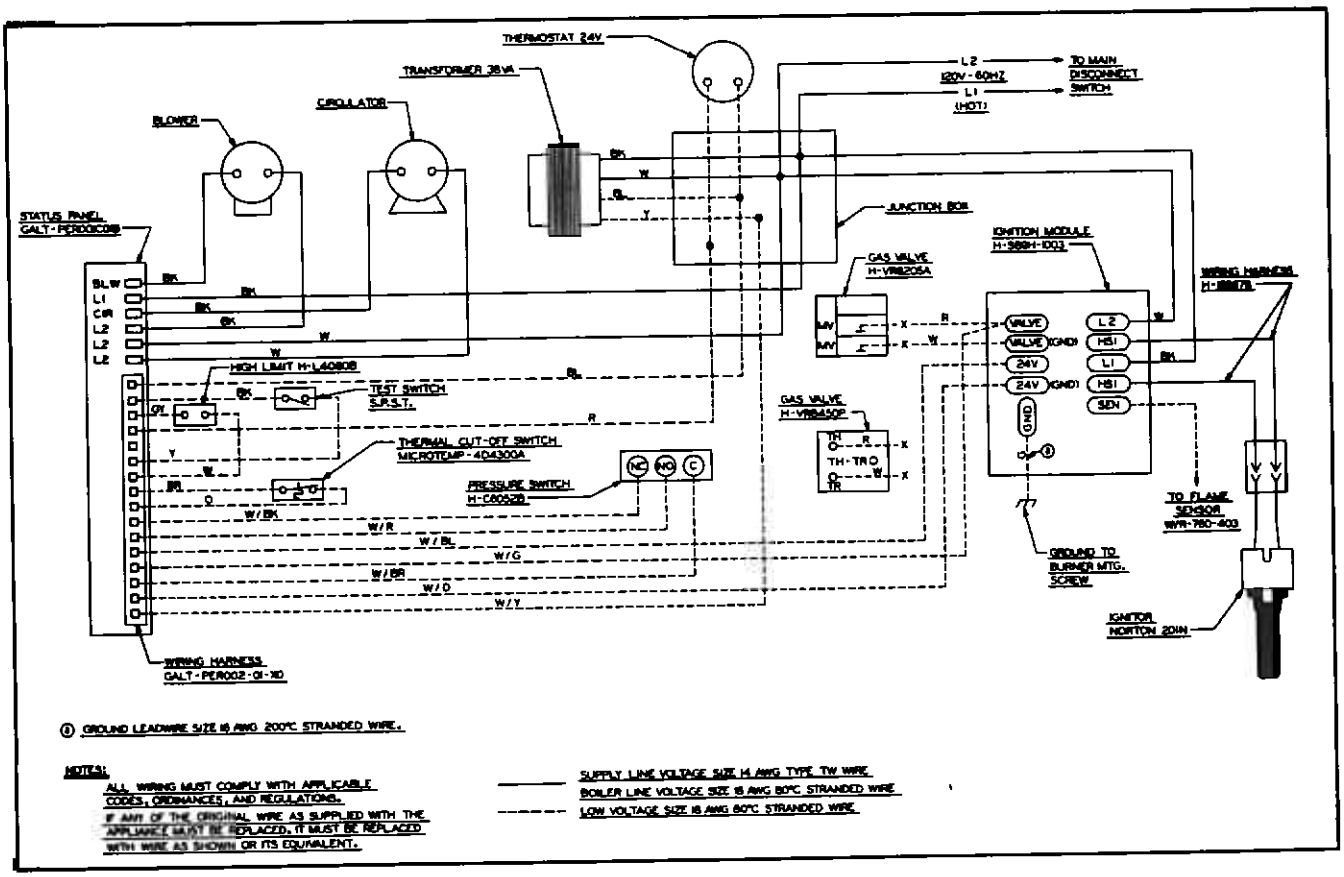


Figure 13

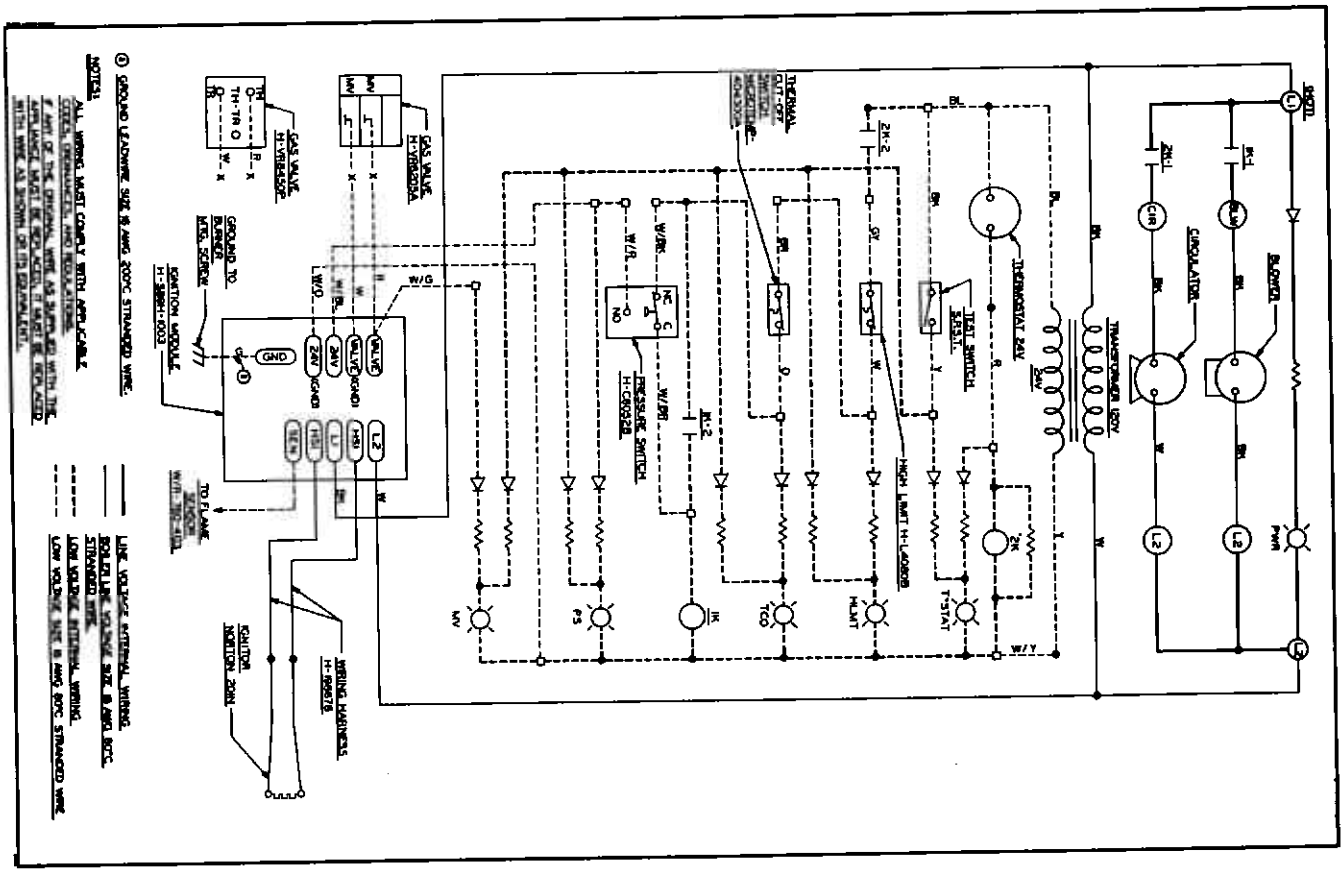


Figure 14

ZONING WITH CIRCULATORS

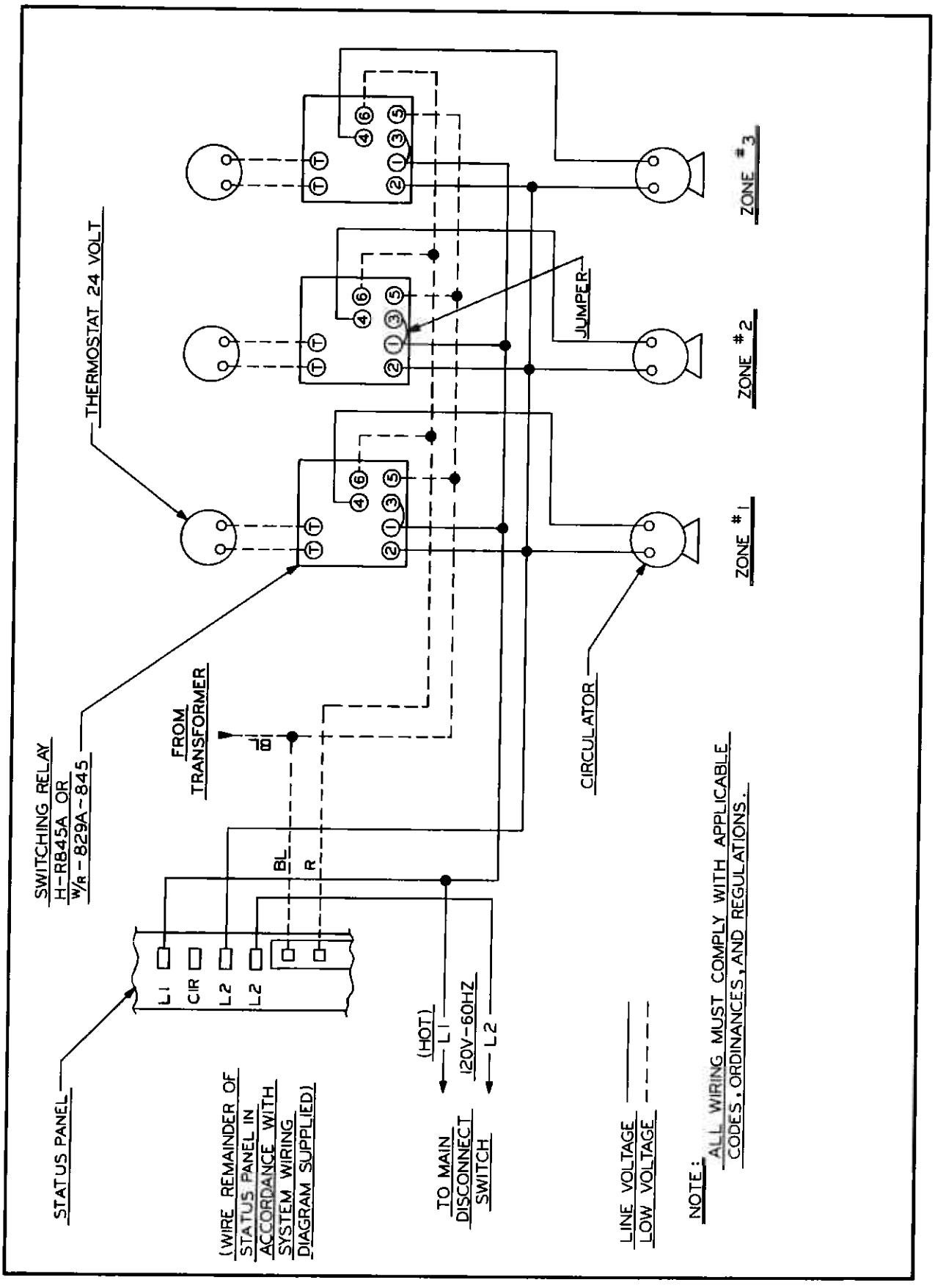


Figure 15

ZONING WITH ZONE VALVES

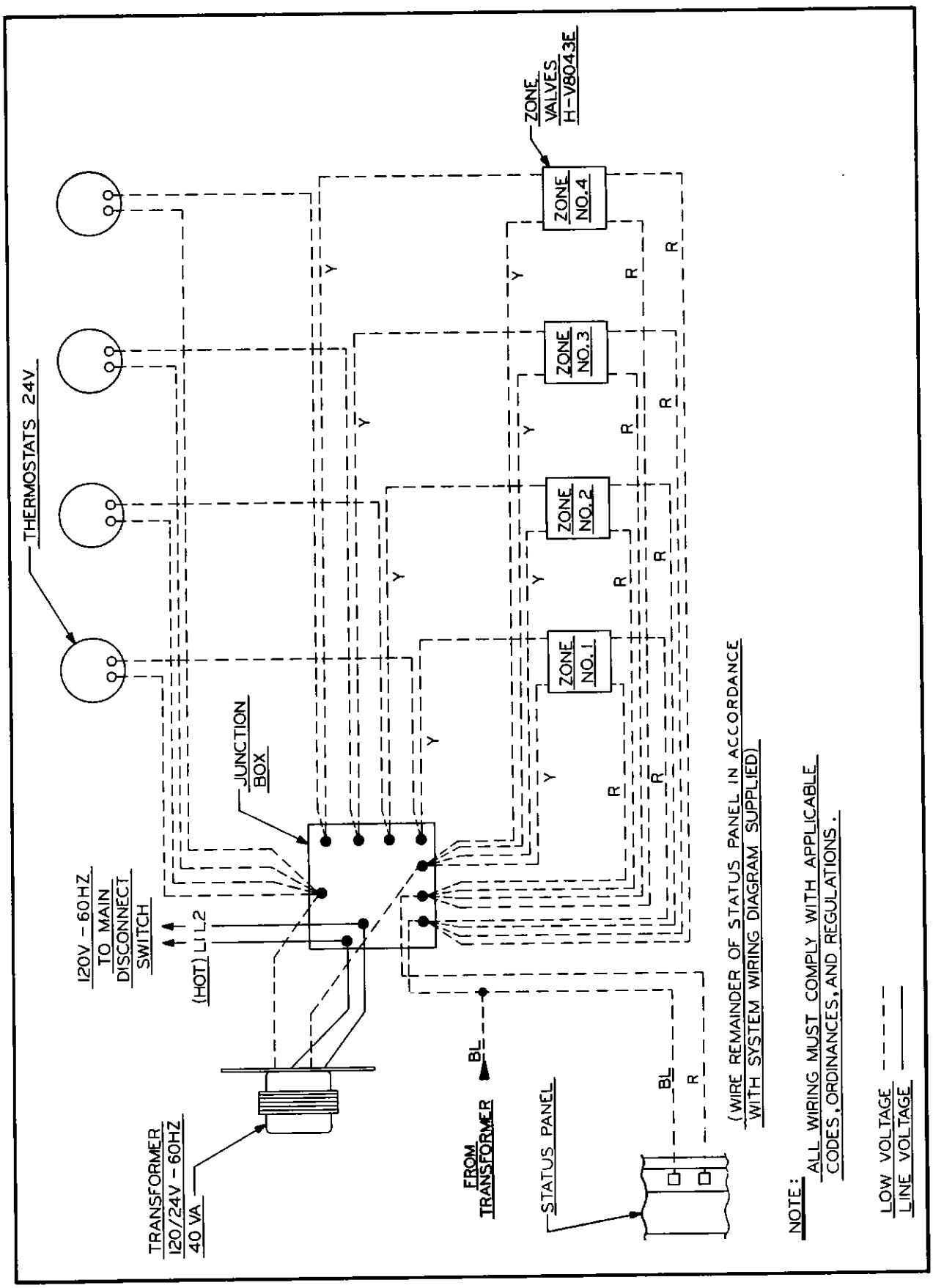


Figure 16

BOILERS EQUIPPED WITH HOT SURFACE IGNITION AND A COMBINATION GAS VALVE

OPERATING INSTRUCTIONS

NOTE: BE CERTAIN SYSTEM IS FULL OF WATER BEFORE PROCEEDING WITH THESE INSTRUCTIONS.

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 does not have a pilot. It is equipped with an ignition device which automatically lights the burner. Do **not** try to light the burner 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.

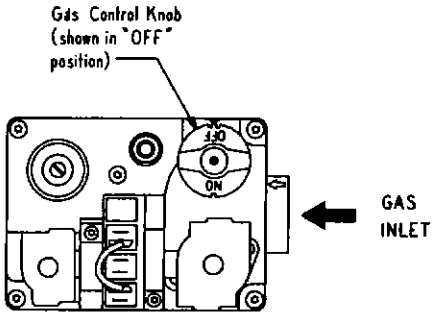
WHAT TO DO IF YOU SMELL GAS
- Do not try to light any appliance.
- Do not touch any electric switch; do not use any phone in your building.
- Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
- If you cannot reach your gas supplier, call the fire department.

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.

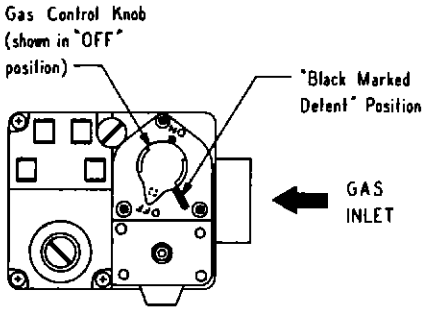
D. Do not use this appliance if any part has been under water. Immediately call a qualified service technician to inspect the appliance and to replace any part of the control system and any gas control which has been under water.

OPERATING INSTRUCTIONS

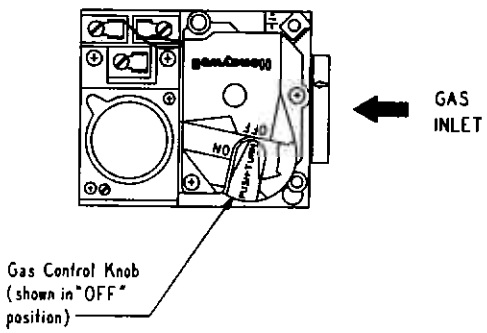
1. STOP! Read the safety information above on this page.
2. Set the thermostat to lowest setting.
3. Turn off all electric power to the appliance.
4. This appliance is equipped with an ignition device which automatically lights the burner. Do **not** try to light the burner by hand.
5. If the gas valve is not visible, remove control access panel. Before proceeding, identify which of the gas valves illustrated below is on your unit.



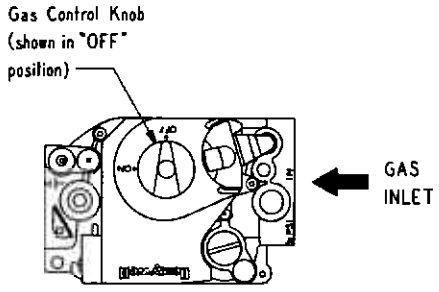
WR-36E VALVE



WR-36C VALVE



H-VR8450 VALVE



H-VR8205 VALVE

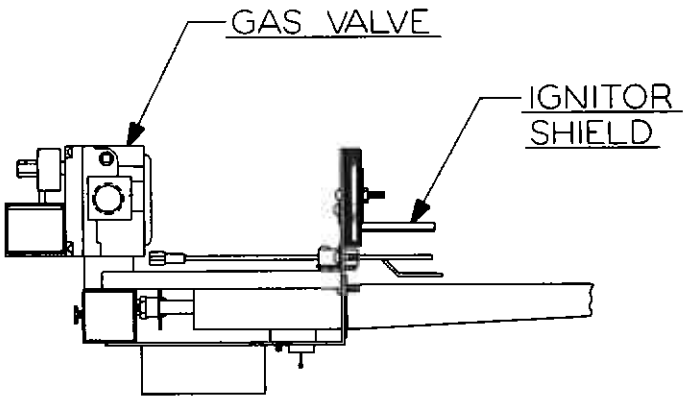
6. WR-36E, H-VR8450 AND H-VR8205 VALVE
   If the gas control knob is not in the "OFF" position, turn the knob clockwise to "OFF."

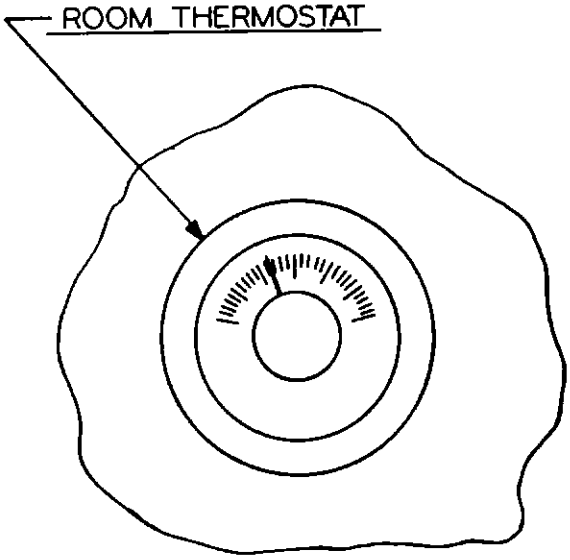
   WR-36C VALVE:
   If the gas control knob is not in the "OFF" position, turn the knob clockwise to the black marked detent. Push the knob in slightly, and continue to turn clockwise to "OFF."

7. Wait five (5) minutes to clear out any gas. Then smell for gas, including near the floor. If you smell gas, STOP! Follow "B" in the safety information above on this label. If you don't smell gas, go to the next step.
8. WR-36E AND H-VR8205 VALVE
   Turn the gas control knob counterclockwise to "ON."

   WR-36C VALVE
   Turn the gas control knob counterclockwise to the black marked detent. Pull the knob up slightly, and continue to turn counterclockwise to "ON."

   H-VR8450 VALVE
   Turn the gas control knob counterclockwise until it stops. Depress knob and continue to turn counterclockwise to "ON."
9. Replace control access panel, if applicable.
10. Turn on all electric power to the appliance.
11. Set the thermostat to desired setting.
12. If the appliance will not operate, follow the instructions "To Turn Off Gas To Appliance" and call your service technician or gas supplier.





TO TURN OFF GAS TO APPLIANCE

1. Set the thermostat to lowest setting.
2. Turn off all electric power to the appliance if service is to be performed.
3. If the gas valve is not visible, remove control access panel.
4. WR-36E, H-VR8450 AND H-VR8205 VALVE

   WR-36C VALVE:
   Turn the gas control knob clockwise to the black marked detent. Push the knob in slightly, and continue to turn clockwise to "OFF."
5. Replace control access panel, if applicable.

P — MAINTENANCE AND INSPECTION

1. This boiler must be disconnected from the gas supply piping during any pressure testing of the system. Refer to "GAS PIPING" Section H.
2. The area where the boiler is contained should be clear and free from combustible materials, gasoline and other flammable vapors and liquids. The boiler area should have ample air for combustion and ventilation and there should be no obstructions preventing a free flow of air.
3. All low water cut-offs should be inspected annually, any float types should be flushed on a weekly basis to remove any sediment from the float bowl.
4. A visual check of burner flame should be conducted at least once a year. The flame intercone should be approximately 1½ inches high and should have a very sharp, blue color characteristic. See Figure 17.
5. The venting system should be inspected at the beginning of each heating season as follows:
   a. Horizontal lengths should have no sags and be firmly supported as described in Section G — VENTING.
   b. Check all pipe joints for a tight seal.
   c. Flush out condensate drain trap annually with water, to remove any debris or obstructions. Fill trap with water after cleaning.
   d. Inspect vent cap and inner screen for any debris that may hinder the normal venting of the boiler.
   e. If using a container to collect condensate, empty and clean weekly or as required.
6. At the beginning of each heating season, flueways and burners should be checked for cleanliness and cleaned if necessary.

   Following procedure would apply if cleaning is required.
   a. Turn off all electrical power to boiler before beginning cleaning operation.
   b. Remove the inner front panel and clean out cover plate located on front of boiler. (The Status Panel and mounting bracket should be removed for easier access.) Brush flueways with a wire brush.
   c. Replace clean out cover plate making sure the blanket seals tightly against front of boiler sections.
   d. Replace inner front panel and Peerless Status Panel with mounting bracket.
   e. Remove the burnerplate/manifold control assembly from the front of the base assembly to gain access to the steel gas burners. Refer to Figure 18. Brush gas burner outlet ports lightly, using a soft bristle brush.

   NOTE: WHEN CLEANING BURNERS ON UNITS EQUIPPED WITH HOT SURFACE IGNITION, TAKE CARE TO AVOID CONTACT WITH SILICON CARBIDE IGNITOR.

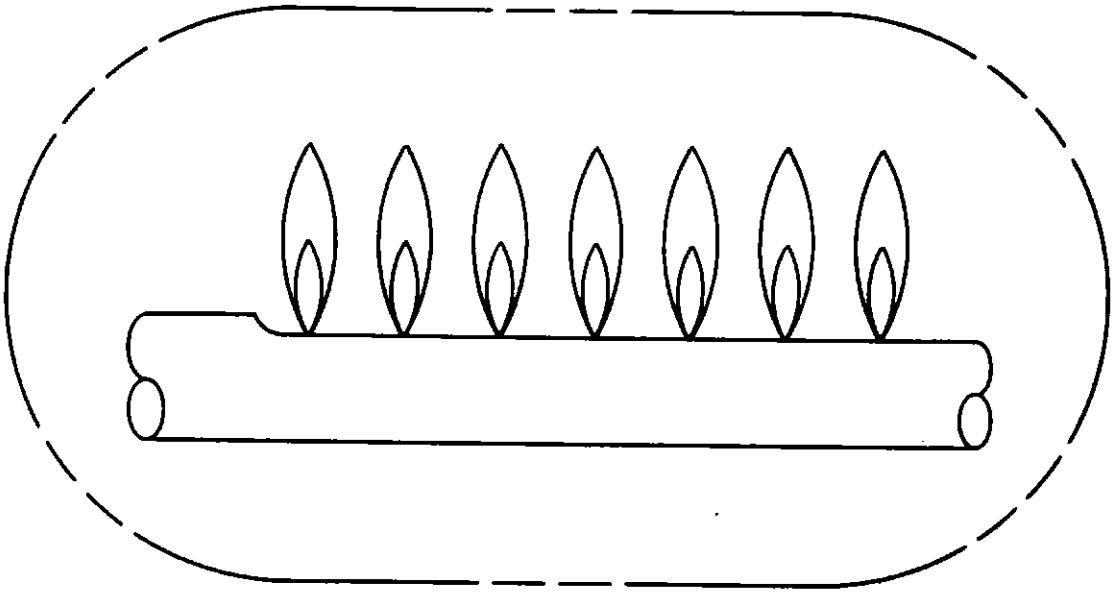
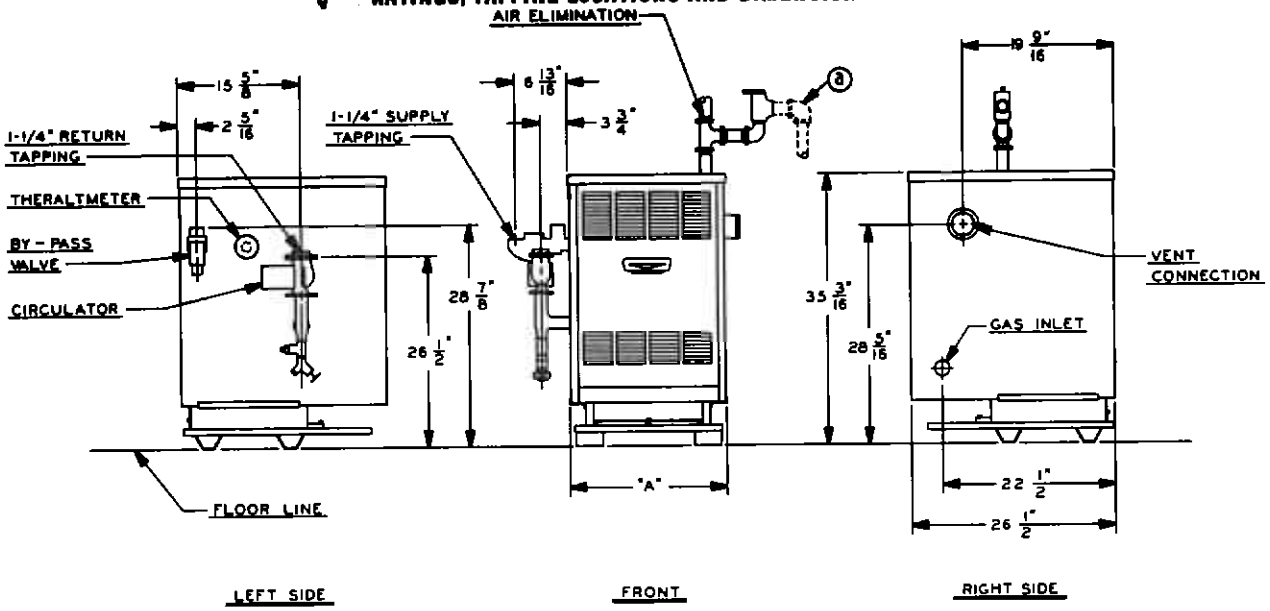


Figure 17

Q — RATINGS, TAPPING LOCATIONS AND DIMENSIONAL DATA



a **CAUTION:** PIPE THE DISCHARGE OF RELIEF VALVE TO PREVENT INJURY IN THE EVENT OF PRESSURE RELIEF. SUGGEST DISCHARGE TO BE PIPED TO DRAIN. PIPE FULL SIZE OF OUTLET.

SERIES PDE BOILER DIMENSIONS

Boiler Model No.	Jacket Width "A"
PDE-03	13 3/8
PDE-04	16 3/4
PDE-05	20 1/8

SERIES PDE RATINGS

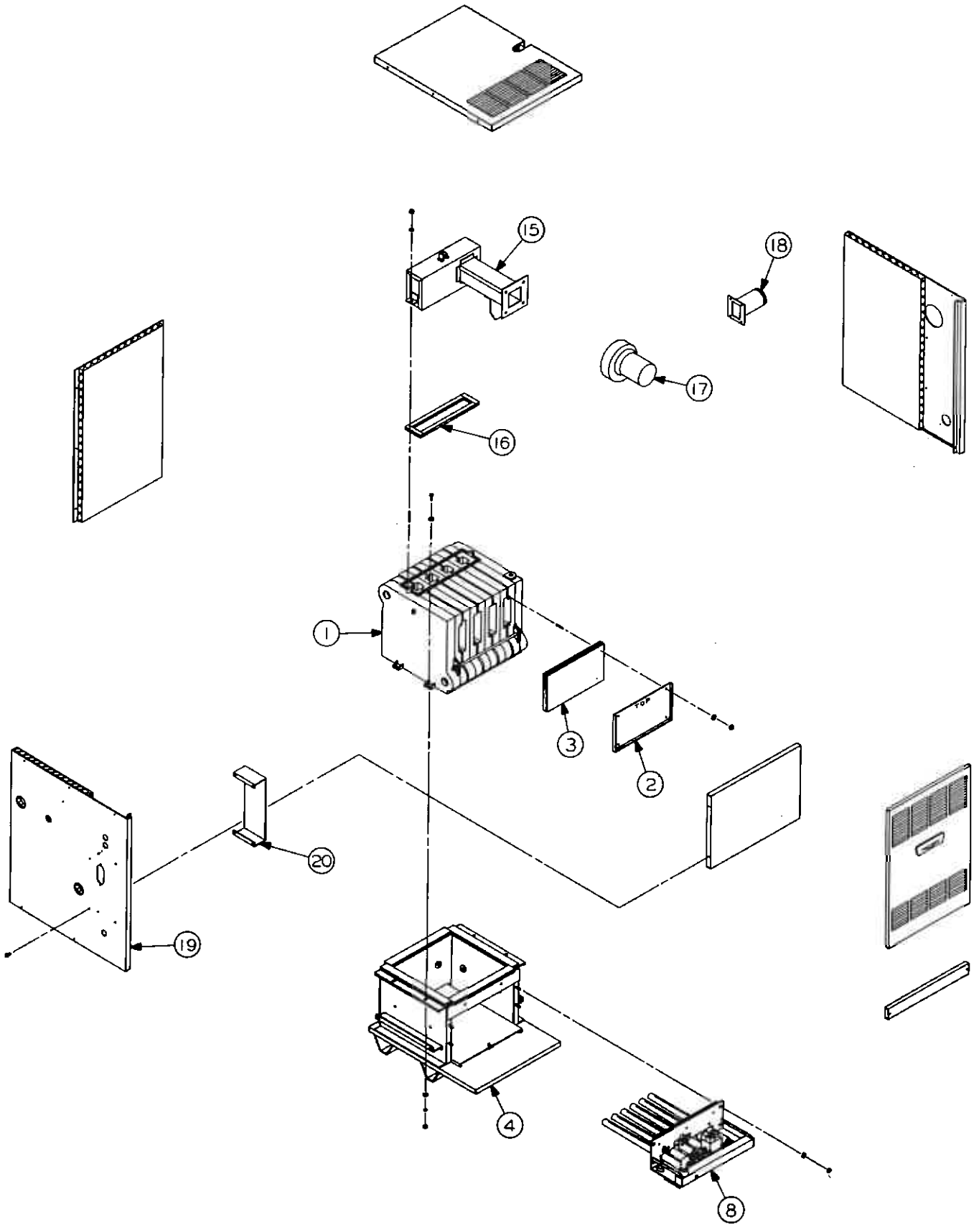
Boiler Model No.	CSA Input MBH	DOE Heating Capacity MBH[3]	Net I=B=R Ratings Water MBH[1,2]	Hot Surface Ignition Seasonal Efficiency AFUE[3] (%)	Water Content (Gallons)
PDE-03*	65.0	56	49	85.0	4.62
PDE-04*	97.5	84	73	85.0	5.90
PDE-05*	130.0	111	97	85.0	7.18

* As an ENERGY STAR® Partner, Peerless Heater Company has determined that this product meets the ENERGY STAR guidelines for energy efficiency.

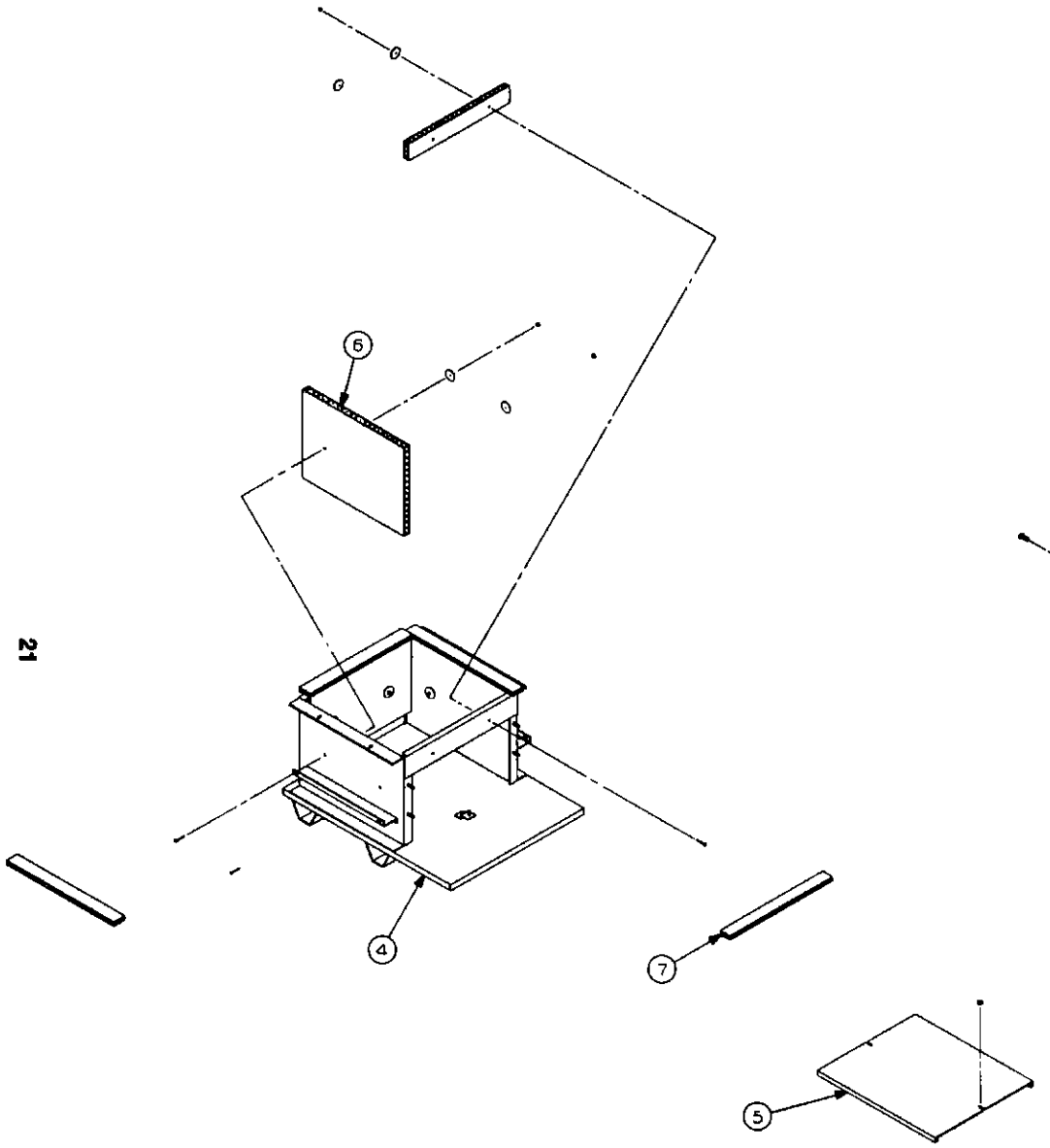
1 Net I=B=R water ratings based on an allowance of 1.15.

2 Consult factory before selecting a boiler for installations having unusual piping and pickup requirements, such as intermittent system operation, extensive piping systems, etc.

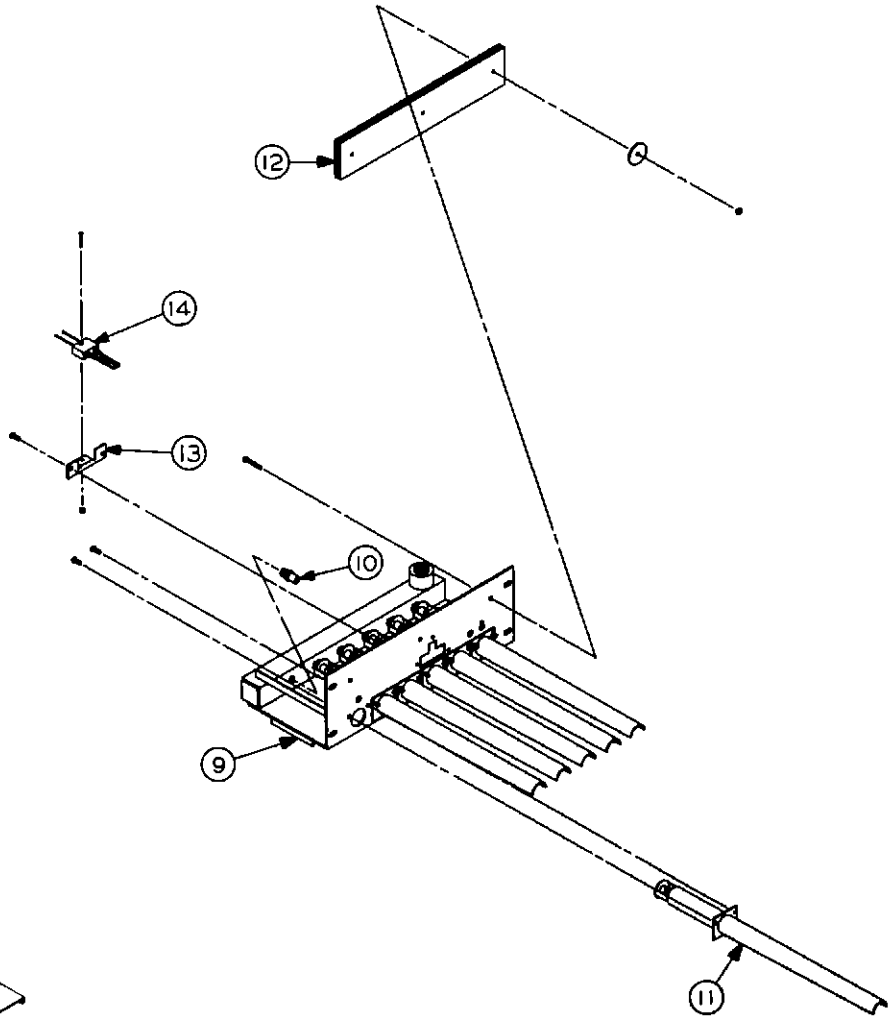
3 Heating Capacity and Annual Fuel Utilization Efficiency (AFUE) ratings are based on U.S. Government test. Before purchasing this appliance, read important information about its estimated annual energy consumptions or energy efficiency rating that is available from your retailer.



EXPLODED VIEW OF BOILER ASSEMBLY
Figure 18



EXPLODED VIEW OF BASE WELDMENT
Figure 19



EXPLODED VIEW OF BURNERPLATE MANIFOLD ASSEMBLY
Figure 20

REPAIR PARTS
SERIES PDE GAS BOILER

REPAIR PARTS ARE AVAILABLE FROM YOUR INSTALLER OR BY CONTACTING PEERLESS HEATER COMPANY, BOYERTOWN, PA 19512-1021.

NOTE: REMEMBER TO INCLUDE BOILER MODEL NUMBER AND SERIAL NUMBER WHEN ORDERING PARTS.

Item No.	Description	Parts Selection Information	PDE-03	PDE-04	PDE-05
1	Block Assembly		91122	91851	91950
2	Cleanout Cover Plate		90596	90597	90598
3	Cleanout Cover Plate Insulation		WW1004	WW1004-1	WW1004-2
4	Assembled Base		99124	91504	91004
5	Reflective Shield		X-2008	X-2008	X-2008
6	Base Insulation	Consult Factory			
7	Base Blanket Seal	Specify Length	50867	50867	50867
8	Burnerplate Manifold		90599	90600	90601
10	Orfice Spud, #44	Natural Gas, 0-2000 ft. elevation Specify Qty.	50890		50890
	Orfice Spud, #45	LP Gas, 0-2000 ft. elevation Specify Qty.		50891	
	Orfice Spud, #55	LP Gas, 0-2000 ft. elevation Specify Qty.	50898	50898	50898
11	Burner	Specify Qty.	51527	51527	51527
12	Burnerplate Insulation	Specify Length	50868	50868	50868
13	Ignitor Mounting Bracket		51582	51582	51582
	Ignitor Shield		51581	51581	51581
14	Ignitor		93537	93537	93537
15	Flue Collector/Fan Mount		90573	90574	90575
16	Flue Collector/Blanket Seal	Specify Length	50866	50866	50866
17	Blower		90390	90390	90390
18	Vent Pipe Adapter		90715	90716	90716
19	Jacket		99665	99666	99667
20	Peerless Status Panel		51806	51806	51806
	Ignition Control		90157	90157	90157
	Limit L4080B-1261		50539	50539	50539
	Pressure Switch	0 to 2000 ft. elevation	51594	51595	51595
	Bypass Valve 595-1		51807	51807	51807
	Bypass Valve Element 595-013		51766	51766	51766
	Temperature Pressure Gauge		51774	51774	51774
	Pressure Relief Valve 30 psi		99945	99945	99945
	Pressure Relief Valve 50 psi		99950	99950	99950
Vent System					
	Drain Tee		51202	51202	51202
	Vent Cap		90713	90713	90713
	Vent Cap Adapter		51201	51201	51201

Series PDE

Gas Boilers

Installation, Operation & Maintenance Manual

TO THE INSTALLER:

This manual is the property of the owner and must be affixed near the boiler for future reference.

TO THE OWNER:

This boiler should be inspected annually by a Qualified Service Agency.

HI Division of gama

ASME

PB HEAT, LLC

9TH & ROTHERMEL DRIVE • P.O. BOX 447 • NEW BERLINVILLE, PA 19545-0447

PeerlessBoilers.com

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