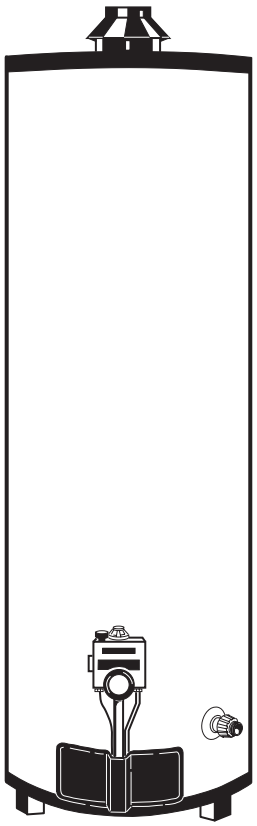
Residential Gas Water Heater

USE & CARE MANUAL

WITH INSTALLATION INSTRUCTIONS FOR THE CONTRACTOR



The purpose of this manual is twofold: for the installing contractor, to provide requirements and recommendations for the proper installation and adjustment of the water heater, and for the owner-operator, to explain the features, operation, safety precautions, maintenance and trouble shooting of the water heater. This manual also includes a parts list.

It is imperative that all persons who are expected to install and maintain the appliance read the technical instructions before installing the appliance and all persons who are expected to light or operate this water heater read the operating instructions carefully before attempting to light or operate the appliance.

Any questions regarding the operation, maintenance, service or warranty of this water heater should be directed to the entity from whom it was purchased. If additional information is required, refer to the section on How to Obtain Service Assistance.

Do Not Destroy this Manual. Please read carefully and keep in a safe place for Future Reference.

Recognize this symbol as an Indication of Important Safety Information!

This appliance shall only be installed in a room with appropriate ventilation requirements per national and local codes and regulations.

WARNING: If the information in these instructions is not followed exactly, a fire or explosion may result causing property damage, personal injury or death.

FOR YOUR SAFETY!

— Do not store or use gasoline or other flammable vapors or liquids or other combustible materials in the vicinity of this or any other appliance. To do so may result in an explosion or fire.

— WHAT TO DO IF YOU SMELL GAS

- **Do not try to light any appliance.**
- **Do not touch any electrical switch; do not use any phone in your building.**
- **Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.**
- **If you cannot reach your gas supplier, call the fire department.**
- **Do not return to your home until authorized by the gas supplier or fire department.**

— Improper installation, adjustment, alteration, service or maintenance can cause injury, property damage or death. Refer to this manual. Installation and service must be performed by a qualified installer, service agency or the gas supplier.

Printed in USA

AP12519 (06/01)

General Safety Precautions

Be sure to read and understand the entire Use & Care Manual before attempting to install or operate this water heater. Pay particular attention to the following General Safety Precautions. Failure to follow these warnings could result in a fire or explosion, causing property damage, bodily injury or death . Should you have any problems understanding the instructions in this manual, STOP, and get help from a qualified installer or service technician or the gas supplier.

Note that the installation and maintenance are covered in other sections and only competent qualified persons shall install and/or adjust this appliance.

The following options may be included in your standard B_{11} type water heater:

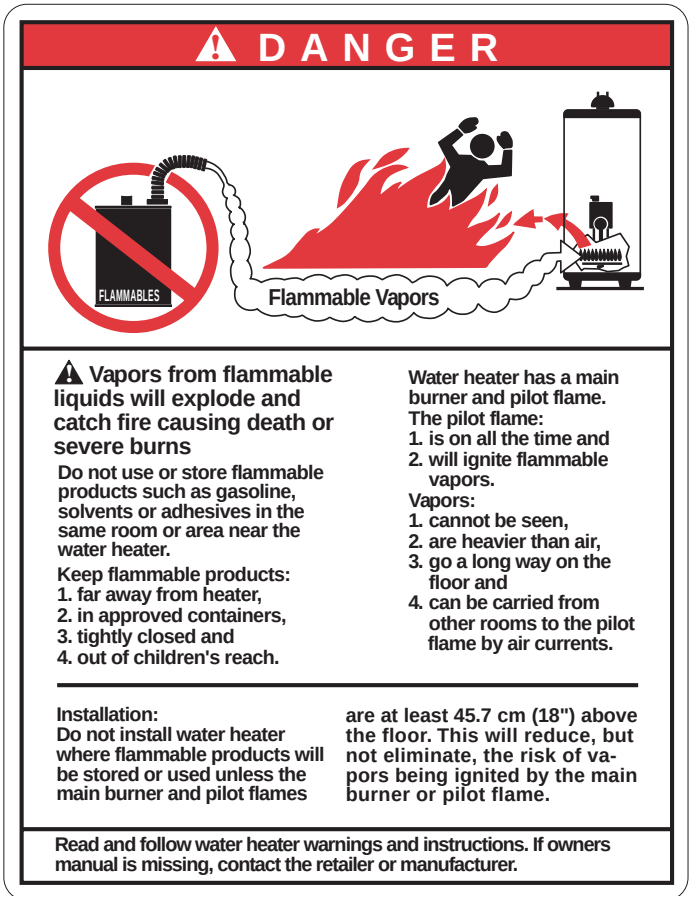
1) Piezo ignitor system.
2) Combustion Products Discharge Safety Device or vent switch. (B_{11BS} Systems)

All options are explained in the manual.

This manual covers Propane (G31), Butane (G30), and Natural Gas (G20) models of the water heater. Your water heater will use only the gas noted on the water heater rating plate.

WARNING

Gasoline, as well as other flammable materials and liquids (adhesives, solvents, etc.), and the vapors they produce, are extremely dangerous. DO NOT handle, use or store gasoline or other flammable or combustible materials anywhere near or in the vicinity of a water heater. Be sure to read and follow the warning label pictured below and other labels on the water heater, as well as the warnings printed in this manual. Failure to do so can result in property damage, bodily injury, or death.



DANGER

Failure to install the draft hood and properly vent the water heater to the outdoors as outlined in the Venting Section of this manual can result in unsafe operation of the water heater. To avoid the risk of fire, explosion, or asphyxiation from carbon monoxide, never operate this water heater unless it is properly vented and has an adequate air supply for proper operation. Be sure to inspect the vent system for proper installation at initial start-up; and at least annually thereafter. Refer to Maintenance section of this manual for more information regarding vent system inspections.

DANGER

LIQUIFIED PETROLEUM (LP) MODELS — Propane or LP gas must be used with great caution.

- **It is heavier than air and will collect first in lower areas making it hard to detect at nose level.**
- **Make sure to look and smell for LP leaks before attempting to light appliance. Use a soapy solution to check all gas fittings and connections. Bubbling at a connection indicates a leak that must be corrected. When smelling to detect an LP leak, be sure to sniff near the floor too.**
- **Gas detectors are recommended in LP applications and their installation should be in accordance with the manufacturer's recommendations and/or local laws, rules, regulations or customs.**
- **It is recommended that more than one method be used to detect leaks in LP applications.**

IF LP GAS IS PRESENT OR SUSPECTED:

- ***DO NOT* attempt to find the cause yourself;**
- ***DO NOT* try to light any appliance;**
- ***DO NOT* touch any electrical switch;**
- ***DO NOT* use any phone in your building.**
- **Leave the house immediately and make sure your family and pets leave also.**
- **Leave the doors open for ventilation and contact the gas supplier, a qualified service agency or the fire department.**
- **Keep the area clear until the service call has been made, the leak is corrected, and a qualified agency has determined the area to be safe.**

WARNING

Both Liquified Petroleum and natural gas have an odorant added to help detection. Some people may not physically be able to smell or recognize this odorant. If unsure or unfamiliar about the smell associated with LP or natural gas, ask the gas supplier. Other conditions, such as "Odorant Fade", which causes the odorant to "fade", or diminish in intensity can also hide or camouflage a gas leak.

General Safety Precautions

DANGER

Water heaters utilizing LP are different from natural gas models. A natural gas heater will not function safely on LP and vice versa. No attempt should ever be made to convert a heater from natural gas to LP gas. To avoid possible equipment damage, personal injury or fire: DO NOT connect this water heater to a fuel type not in accordance with unit data plate. Propane for propane units. Natural gas for natural gas units. Butane for butane units. These units are not certified for any other type fuel. Failure to comply with this warning may result in serious injury, burn, or death.

WARNING

LP appliances should not be installed below-grade (for example, in a basement) if such installation is prohibited by federal, state and/or local laws, rules, regulations or customs.

WARNING

This water heater may be equipped with a vent switch which interrupts the gas supply if the venting is blocked. To avoid possible severe injury or property damage DO NOT disconnect the vent switch circuit. The safety of the appliance and the safety of the final user is inhibited if the vent switch circuit is disconnected.

The failure to install or tampering with a vent switch equipped appliance may violate local, federal and national codes or regulations. Units equipped with a vent switch shall not be operated without the switch correctly installed.

A Type B_{11} water heater is not equipped with a vent switch. It must only be installed in a room separated from inhabited rooms with suitable ventilation directly to the outside. (See Combustion & Ventilation Air Section)

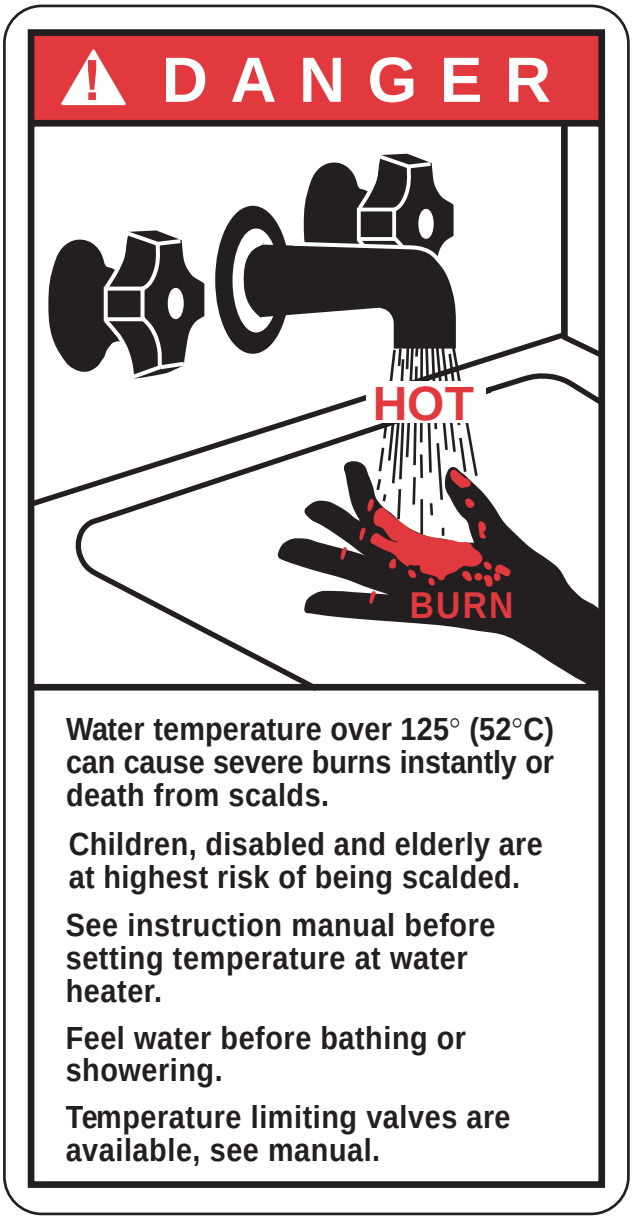
A Type B_{11Bs} is equipped with a vent switch. It must be installed in locations that meet suitable venting requirements. (See Combustion & Ventilation Air Section)

WATER TEMPERATURE ADJUSTMENT - Safety and energy conservation are factors to be considered when selecting the water temperature setting of water heater's thermostat. Excessive high water temperatures can cause severe burns or death from scalding. Consult local, national, and federal codes and regulations for recommended temperature settings. Be sure to read and follow the warnings outlined on the label pictured on the right.

Maximum water temperatures occur just after burner has shut off. To find the hot water temperature being delivered, turn on a hot water faucet and place a thermometer in the hot water stream and read the thermometer.

The chart on the right may be used as a guide in determining the proper water temperature for your home.

The temperature of the water in the heater can be regulated by setting the temperature dial on front of the thermostat. The thermostat was set at its lowest setting before the water heater was shipped from the factory.



TIME / TEMPERATURE RELATIONSHIPS IN SCALDS

Temperature	Time to Produce Serious Burn
49° C (120° F)	More than 5 minutes
52° C (125° F)	1½ to 2 minutes
54° C (130° F)	About 30 seconds
57° C (135° F)	About 10 seconds
60° C (140° F)	Less than 5 seconds
63° C (145° F)	Less than 3 seconds
66° C (150° F)	About 1½ seconds
68° C (155° F)	About 1 second

Table courtesy of Shriners Burn Institute

Figure 1 details the approximate water temperature for each mark on the Thermostat Temperature Dial.

Consult your local, national, and federal codes and regulations for recommended temperature settings.

General Safety Precautions

DANGER

1. **Low water temperatures may lead to bacterial growth.**
2. **High water temperatures can increase the risk of scalding and burns.**
3. **Children, disabled and elderly are at highest risk of being scalded.**
4. **See instruction manual before setting temperature on the water heater.**
5. **Feel water before bathing or showering.**

Mixing valves for reducing point of use water temperature by mixing hot and cold water in branch water lines are available. Contact a licensed plumber or the local plumbing authority for further information.

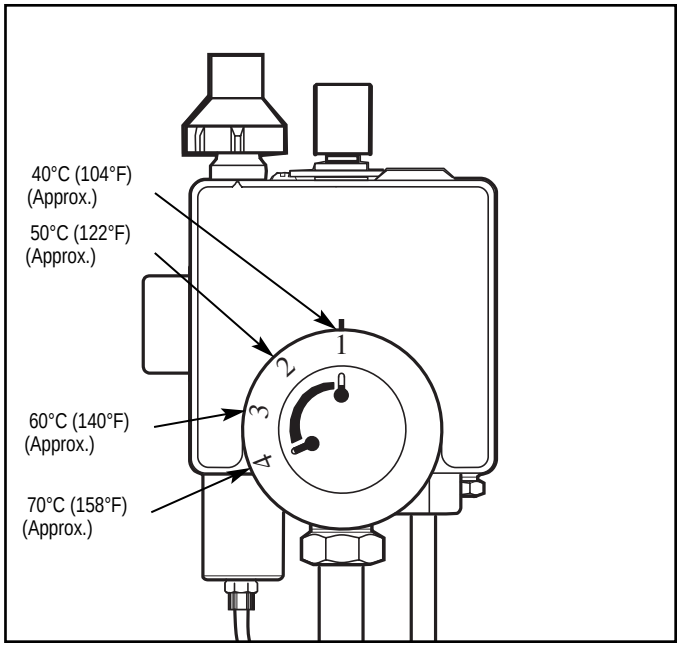


Figure 1

Introduction

COMPONENTS OF YOUR WATER HEATER — So that you may better understand the operation of your new water heater, the following section illustrates the basic components of a typical water heater.

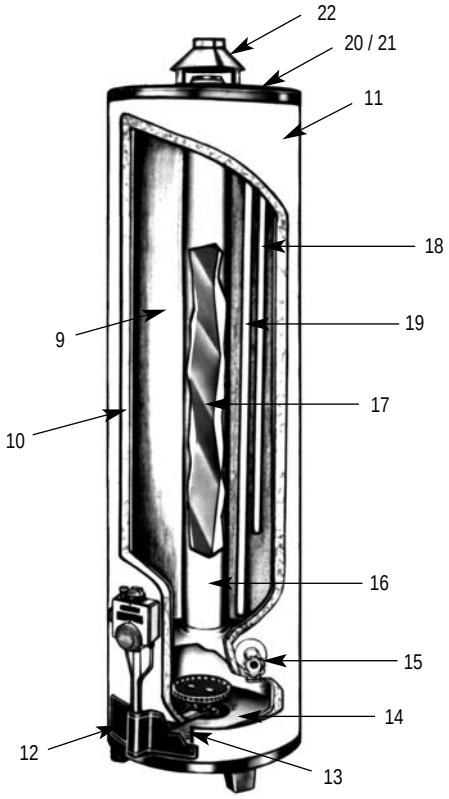


Fig. 2a. — Basic Gas Water Heater

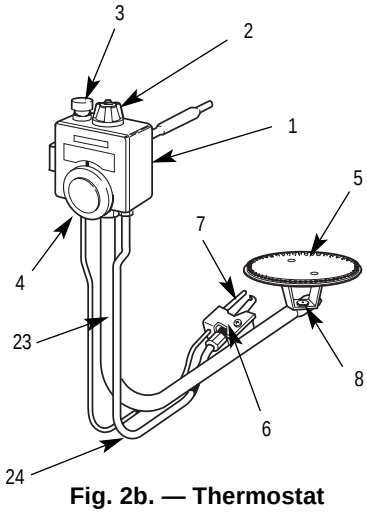


Fig. 2b. — Thermostat and Burner

1. Thermostatic Gas Valve
2. Gray Removable Cap
3. Gas Cock Knob
4. Thermostat Temperature Dial
5. Main Burner
6. Pilot Burner
7. Thermocouple
8. Main Burner Orifice
9. Glasslined Tank
10. Insulation
11. Jacket
12. Jacket Door
13. Inner Door
14. Floor Shield
15. Drain Valve
16. Internal Flueway
17. Flue Baffle
18. Dip Tube (Cold Water Inlet)
19. Anode
20. Relief Valve Opening (On Top/ or Side)
21. Water Connections (On Top)
22. Draft Hood
23. Burner Supply Tube
24. Pilot Supply Tube

Technical Instructions and Information

Introduction

⚠ CAUTION

Installation, operation, and maintenance are covered in separate sections. Read the entire Use and Care Manual before attempting any of these tasks. Only qualified service persons should perform these tasks.

⚠ WARNING

Read and Review this entire Manual with special emphasis on the Venting Section (Pages 7 - 8) and Operation Section (Pages 9 - 12) prior to any installation work

The location chosen for the water heater must take into consideration the following:

LOCAL INSTALLATION REGULATIONS

This water heater must be installed in accordance with these instructions, utility company requirements, local, federal, and national codes.

LOCATION

If your water heater is not equipped with a vent switch it must ONLY be installed in a room separated from living spaces and supplied with suitable ventilation directly to the outside. (See Combustion & Ventilation Air Section)

A. A gas fired water heater should not be installed in a space where liquids which give off flammable vapors are to be used or stored. Such liquids include gasoline, LP gas (butane and propane), paint or adhesives and their thinners, solvents or removers. Because of natural air movement in a room or other enclosed space, flammable vapors can be carried some distance from where their liquids are being used or stored. The open flame of the water heater's pilot light or main burner can ignite these vapors causing an explosion or fire which may result in severe burns or death to those in range, as well as property damage. For these reasons installation of a gas fired water heater in a garage is not desirable.

⚠ WARNING

If a location in a garage is the only alternative, the gas water heater should be installed so that the open flame of the pilot and main burner are no less than 45.7 cm (18 inches) above the garage floor, unless specifically exempted from this by local code, rule, regulation or custom. Raising the gas fired water heater will reduce but not eliminate the possibility of lighting the vapor of any flammable liquids which may be improperly stored or accidentally spilled.

The water heater must be located or protected so it is not subject to physical damage, for example, by moving vehicles, area flooding etc.

B. The water heater should be installed as close as practical to the gas vent or chimney. Long hot water lines should be insulated to conserve water and energy. The water heater and water lines should be protected from exposure to freezing temperatures. DO NOT install the water heater in bathrooms, bedrooms, any occupied rooms normally kept closed, or in outdoor unprotected areas.

C. Minimum clearance from combustible construction is 2.5 cm (1 inch) sides and rear; 7.6 cm (3 inches) from front of control; 30.5 cm (12 inches) top. If clearances stated on Instruction/Warning label, located on front of heater, differ from the aforementioned clearances, install heater according to the clearances stated on the Instruction/Warning label. The water heater may be installed on combustible floors, but not directly on carpeting. If the water heater must be installed on carpeting, place a metal or wood panel beneath water heater, extending beyond its full width and depth at least 7.6 cm (3 inches) in all directions. If the water heater is installed in an alcove or closet, the entire floor must be covered by the panel. A minimum of 61 cm (24 inches) clearance from the front and top should be available for adequate inspection and servicing.

⚠ WARNING

"Combustible construction" refers to adjacent walls and ceilings, and should not be confused with combustible or flammable products and materials. Combustible and/or flammable products and materials should never be stored in the vicinity of this or any gas appliance.

⚠ CAUTION

The water heater should not be located in an area where leakage of the tank or connections will result in damage to the area adjacent to it or to lower floors of the structure. When such areas cannot be avoided, it is recommended that a suitable catch pan, adequately drained, be installed under the water heater. The pan MUST NOT restrict combustion air flow to bottom of water heater.

NOTE: Auxiliary catch pan installation MUST conform to local code

D. COMBUSTION & VENTILATION AIR — Proper operation of the water heater requires air for combustion and ventilation. If the water heater is installed in an unconfined space within a building of conventional frame, masonry or metal construction, infiltration air is normally adequate for proper combustion and ventilation. However, if the space is confined, provisions for this air must be made. Location of the water heater shall ensure adequate air flow for combustion and ventilation and allow easy access to piping and water heater components. Requirements pertaining to the necessary space surrounding the heater, as well as requirements about venting, are included in the building regulations. Consult local and national codes and regulations for minimum clearences.

NOTE: If the openings are to be covered with a protective screen or grill, the net free area of the covering material must be used in determining the size of the openings. Protective screening for the openings MUST NOT be smaller than 0.7 cm (1/4 inch) mesh to prevent clogging by lint or other debris.

Provisions for combustion and ventilation air must comply with applicable codes and standards.

E. CORROSIVE ATMOSPHERES —The water heater should not be installed near an air supply containing halogenated hydrocarbons. For example,the air in beauty shops, dry cleaning establishments, photo processing labs, and storage areas for liquid and powdered bleaches or swimming pool chemicals often contain such hydrocarbons. The air there maybe safe to breathe, but when it passes through a gas flame, corrosive elements are released that will shorten the life of any gas burning appliance. Propellants from common spray cans or gas leaks from refrigeration equipment are highly corrosive after passing through a flame. The limited warranty is voided when failure of water heater is due to a corrosive atmosphere. (Reference is made to the limited warranty for complete terms and conditions.)

Installation

1. **INSPECT SHIPMENT**—Inspect water heater for possible shipping damage. Check the marking of the rating plate of the water heater to be certain the type of gas being furnished corresponds to that for which the water heater is equipped.

2. **THERMAL EXPANSION — During installation, a check valve should have been installed in the inlet water line.** It may have been installed in the cold water line as a separate back flow preventer, or it may be part of a pressure reducing valve, water meter or water softener. A check valve located in the cold water inlet line can cause what is referred to as a **"closed water system"**. A cold water inlet line with no check valve or back flow prevention device is referred to as an "open" water system.

   As water is heated, it expands in volume and creates an increase in the pressure within the water system. This action is referred to as **"thermal expansion"**. In an "open" water system, expanding water which exceeds the capacity of the water heater flows back into the city main where the pressure is easily dissipated.

   A **"closed water system"**, however, prevents the expanding water from flowing back into the main supply line, and the result of **"thermal expansion"** can create a rapid, and dangerous pressure increase in the water heater and system piping. This rapid pressure increase can quickly reach the safety setting of the relief valve, causing it to operate during each heating cycle. Thermal expansion, and the resulting rapid, and repeated expansion and contraction of components in the water heater and piping system can cause premature failure of the relief valve, and possibly the heater itself.Replacing the relief valve **will not** correct the problem!

   The suggested method of controlling thermal expansion is to install an expansion tank in the cold water line between the water heater and the check valve. (Refer to Figure 3.) The expansion tank is designed with an air cushion built in that compresses as the system pressure increases, thereby relieving the over pressure condition and eliminating the repeated operation of the relief vale. Other methods of controlling thermal expansion are also available. Contact your installing contractor, water supplier, or plumbing inspector for additional information regarding this subject.

3. **WATER SUPPLY CONNECTIONS —** Refer to Fig. 3 for suggested typical installation. The installation of unions or flexible copper connectors is recommended on the hot and cold water connections so that the water heater may be easily disconnected for servicing if necessary. The HOT and COLD water connections are clearly marked and are 3/4" NPT on all models. Install a shut-off valve in the cold water line near the water heater.

IMPORTANT!! Do not apply heat to the hot or cold water connections. If sweat connections are used, sweat tubing to adapter before fitting adapter to hot or cold water connections on heater. Any heat applied to the hot or cold water supply fittings will permanently damage them.

NOTICE: A check valve must be installed in the cold-water inlet as per local and national codes and regulations.

4. **RELIEF VALVE —** A new combination temperature and pressure relief valve, complying with the Standard for Relief Valves and Automatic Gas Shutoff Devices for Hot Water Supply Systems, ANSI Z21.22, or equivalent local or international standard, must be installed in the opening provided and marked for the purpose on the water heater. (Refer to Fig. 3.) No valve of any type should be installed between the relief valve and the tank. Local codes shall govern the installation of relief valves.

   The pressure rating of the relief valve must not exceed 10.3 bar (150 psi). This is the maximum working pressure of the water heater and is marked on the rating plate.

⚠ WARNING

The Btu/hr Rating of the relief valve must not be less than the input rating of the water heater as indicated on the rating label located on front of the heater (1 watt = 3.412 BTU/HR).

⚠ WARNING

Connect the outlet of the relief valve to a suitable open drain so that the discharge water cannot contact live electrical parts and to eliminate potential water damage. Piping used should be of a type approved for hot water distribution. The discharge line must be no smaller than the outlet of the valve and must pitch downward from the valve to allow complete drainage (by gravity) of the relief valve and discharge line. The end of the discharge line should not be threaded or concealed and should be protected from freezing. No valve of any type, restriction or reducer coupling should be installed in the discharge line.

5. **TO FILL WATER HEATER —** Make certain drain valve is completely closed. Open shut-off valve in cold water supply line. Open each hot water faucet slowly to allow air to vent from the water heater and piping. A steady flow of water from the hot water faucet(s) indicates a full water heater.

⚠ WARNING

Tank MUST BE full of water before pilot is lit. The water heater's warranty does not cover damage or failure resulting from operation with an empty or partially empty tank.

6. **GAS SUPPLY -** The branch gas supply line to the water heater should be clean 13 mm (1/2 inch) black steel pipe or other approved gas piping material. A ground joint union or equivalent national standard design certified semirigid or flexible gas appliance connector should be installed in gas line closest to the water heater, and a manual gas shut-off valve should be installed in the gas line prior to the union. The manual gas shut-off valve should be at least 1.5 meters (5 feet) above the floor and readily accessible for turning on or off. A sediment trap should be installed at the bottom of the gas line. (Ref. to Fig. 3)

   Compound used on threaded joints of the gas piping must be of the type resistant to the action of LP gas. Use compound sparingly on male threads only. Do not use excessive force over 42.7 N-m (31.5 Ft. Lbs.) in tightening the pipe joint at the thermostat inlet, particularly if teflon pipe compound is used, as the valve body may be damaged.

   The inlet gas pressure to the water heater must not exceed 25 mbar (10.1" w.c) for Natural gas or 57.5 mbar (23.14" w.c.) Propane gas. For purposes of input adjustment, the nominal inlet gas pressure (with main burner on) is shown on the water heater rating plate. If high or low gas pressures are present, contact your gas supplier for correction.

7. **CHECKING MANIFOLD GAS PRESSURE - ONLY QUALIFIED SERVICE PERSONNEL MAY VERIFY THE MANIFOLD GAS PRESSURE.** A manometer, spigot (provided in the Use and Care Manual bag), and 8mm (5/16 inch) ID flexible hose are required. Turn the thermostat to the lowest temperature setting. Turn gascock to "PILOT" position. Remove 1/8" NPT pressure tap plug, located on bottom of thermostat, beside burner supply tube. Tighten spigot into this threaded hole using standard procedures to assure correct fit and leak free joints. Connect one end of flexible hose to manometer. Back the screw in the spigot out until only two threads hold screw in place. Push other end of hose over barb of spigot, turn thermostat to required setting and measure pressure.

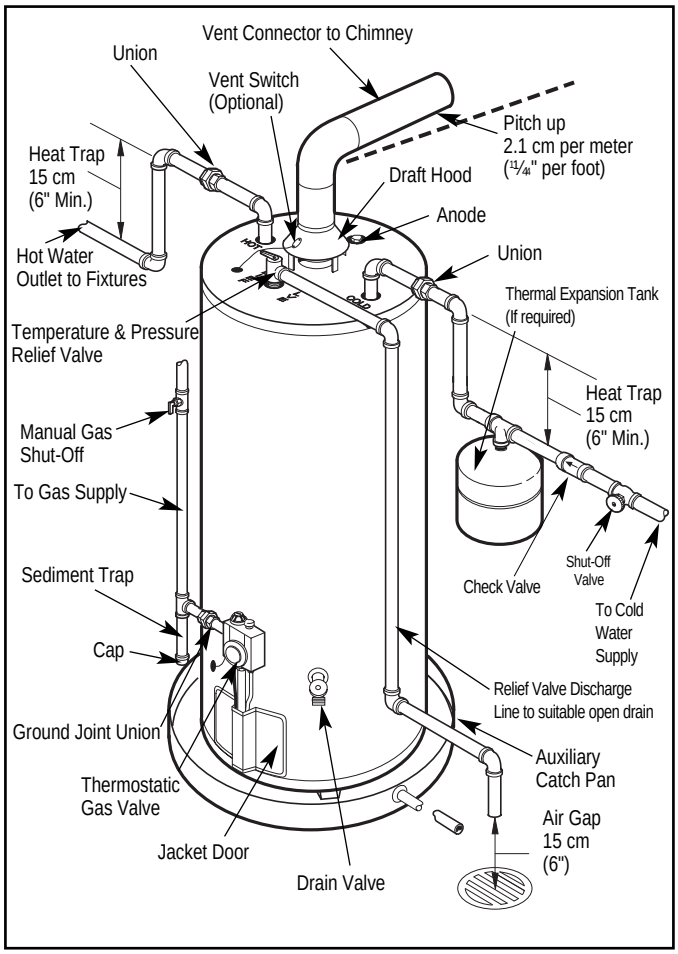


Figure 3. — Typical Installation

Tighten the spigot screw and check for gas leaks before placing the water heater in service.

⚠ DANGER

Do not attempt to convert this water heater for use with a different type of gas other than the type shown on the rating plate. Such conversion could result in hazardous operating conditions.

⚠ WARNING

8. **LEAK TESTING -** The water heater and its gas connections must be leak tested at normal operating pressures before it is placed in operation. Turn on the manual gas shut-off valve near the water heater (Refer to Fig. 3). Use a soapy water solution to test for leaks at all connections and fittings. Bubbles indicate a gas leak that must be corrected. The factory connections to the thermostat should also be leak tested immediately after the water heater is placed in operation.

⚠ WARNING

Never use open flame to test for gas leaks, as bodily injury, property damage, or death could result.

PRESSURE TESTING THE GAS SUPPLY SYSTEM - The water heater and its manual gas shut-off valve must be disconnected from the gas supply piping system during any high pressure testing of that system at pressures in excess of 57.5 mbar (23.14" w.c.).

The water heater must be isolated from the gas piping system by closing the manual gas shut-off valve (Refer to Fig. 3), during any pressure testing of the gas supply piping at pressures equal to or less than 57.5 mbar (23.14" w.c.) or as described in local codes.

9. **INSTALLATION INSTRUCTIONS FOR VENT SWITCH:** The draft hood is included in the water heater carton. Upon removal from the carton, verify the vent switch is not damaged. Place the draft hood over the flue opening on the top of the water heater. Orient the draft hood so that the vent switch is close to the vent switch wire connections on the top of the tank. Using two screws, attach the drafthood to the top of the heater. Attach the female spade connectors on the vent switch wire to the male spade connectors on the vent switch.

⚠ DANGER

NOTICE: Do NOT pull or twist wiring attached to vent switch unit as this may damage unit.

Failure to install or the interruption of the vent switch may violate local and national safety regulations. Type B_{11BS} water heaters shall not be operated without the vent switch sensors installed correctly.

⚠ WARNING

The safety of the appliance is inhibited if the vent switch circuit is disconnected.

NOTE: Repeated shutdown due to operation of vent switch indicates that an improper condition exists. Contact a licensed plumber or qualified service personel to correct this issue.

10. **VENTING** - This water heater must be installed with the factory supplied draft hood in place. (Refer to Fig. 3.) Vent connectors must be attached to the draft hood outlet to connect the water heater to the gas vent or chimney. The vent connectors must be the same size (diameter) as the draft hood outlet or larger, never smaller. For proper venting in certain installations a larger vent connector size may be needed.

    Horizontal vent connectors must be pitched upward to the chimney at least 2.10 cm per meter (1/4" per foot). Single wall vent connectors must be at least 15.5 cm (6 inch) from adjacent unprotected combustible surfaces. Joints of vent connectors should be securely fastened by sheet metal screws or other approved method.

⚠ WARNING

Failure to install the draft hood and properly vent the water heater to the outdoors as outlined above can result in unsafe operation of the water heater causing bodily injury, explosion, fire or death. To avoid the risk of fire, explosion, or asphyxiation from carbon monoxide, NEVER operate this water heater unless it is properly vented and has as adequate air supply for proper operation.

Be sure to inspect the vent system for proper installation at initial start-up; and at least annually thereafter. Refer to Maintenance section of this manual for more information regarding vent system inspections.

⚠ WARNING

The manufacturer's warranty does not cover any damage or defect caused by installation, attachment or use of any type of energy saving or other

unapproved devices (other than those authorized by the manufacturer) into, onto or in conjunction with the water heater. The use of unauthorized energy saving devices may shorten the life of the water heater and may endanger life and property. The manufacturer disclaims any responsibility for such loss or injury resulting from the use of such unauthorized devices.

⚠ WARNING

Application of any external insulation to this water heater will require careful attention to the following:

- ***Do not*** **apply insulation to the top of the water heater, as this will interfere with the safe operation of the draft hood**
- ***Do not*** **cover burner access panel, thermostat/gas valve or pressure and temperature relief valve.**
- ***Do not*** **cover operating instructions or warning labels attached to the water heater nor attempt to relocate them on the exterior of the insulation blanket.**
- ***Do not*** **apply insulation to bottom or the 51 mm (2") space between the bottom pan of the water heater and the floor, as this area must be unobstructed so as not to restrict combustion air flow to the burner.**
- ***Do*** **inspect the insulation blanket frequently to make certain it has not sagged and is restricting the combustion air to the bottom of the water heater, as this could result in an unsafe operating condition.**

Installation Check List

A Water Heater Location

- ❑ Close to area of vent.
- ❑ Indoors and protected from freezing temperatures.
- ❑ Proper clearance from combustible surfaces observed and water heater not installed on carpeted floor.
- ❑ Sufficient fresh air supply for proper operation of water heater.
- ❑ Air supply free of corrosive elements and flammable vapors.
- ❑ Provisions made to protect area from water damage.
- ❑ Sufficient room to service heater.

B. Water Supply

- ❑ Water heater completely filled with water.
- ❑ Water heater and piping air vented.
- ❑ Water connections tight and free of leaks.
- ❑ Check valve installed in inlet.

C. Gas Supply

- ❑ Gas line equipped with shut-off valve, union and sediment trap.
- ❑ Approved pipe joint compound used.
- ❑ Soap and water solution used to check all connections and fittings for possible gas leak.
- ❑ Gas Company inspected installation (if required).

D. Relief Valve

- ❑ Temperature and Pressure Relief Valve properly installed and discharge line run to open drain.
- ❑ Discharge line protected from freezing.

E. Venting

- ❑ Flue baffle properly hung in top of heater's flue.
- ❑ Draft hood properly installed.
- ❑ Vent connector(s) pitched upward to chimney require a minimum of 2.10 cm per meter (1/4" per foot) of length .
- ❑ Vent connector(s) securely fastened together with screws.
- ❑ Single wall vent connector(s) at least 15.24 cm (6") from combustible material.
- ❑ Vent switch should be in full contact with drafthood surface.
- ❑ Vent switch connections are secure.

Operation

Before operating this water heater, be sure to read and follow the instructions on the label pictured below and all other labels on the water heater, as well as the warnings printed in this manual. Failure to do so can result in unsafe operation of the water heater resulting in property damage, bodily injury, or death. Should you have any problems reading or following the instructions in this manual, STOP, and get help from a qualified person.

1. MANUAL LIGHTING PROCEDURE - Lighting procedures are outlined on the label pictured below. This label is also located on the water heater near the thermostat.

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 has a pilot which must be lighted by hand. When lighting the pilot, follow these instructions exactly.

B. BEFORE LIGHTING smell all around the appliance area for gas. Be sure to smell next to the floor because some gas is heavier than air and will settle on the floor.

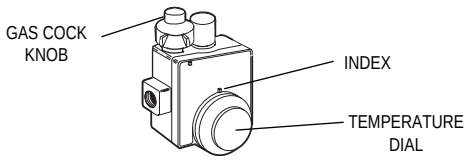
WHAT TO DO IF YOU SMELL GAS:
- Do not try to light the appliance.
- Do not touch any electrical switch; do not use any phone in your building.
- Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
- If you cannot reach your gas supplier, call the fire department.

C. Use only your hand to turn the gas control knob. Never use tools. If the knob will not turn by hand, don't try to repair it, call a qualified service technician. Force or attempted repair may result in fire or explosion.

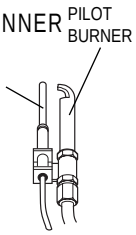
D. Do not use this appliance if any part has been under water. Immediately call a qualified service technician to inspect the appliance and to replace any part of the control system and any gas valve that has been under water.

LIGHTING INSTRUCTIONS

1. **STOP!** READ THE SAFETY INFORMATION ABOVE ON THIS LABEL.
2. TURN GAS COCK KNOB CLOCKWISE TO "OFF" POSITION.



3. TURN TEMPERATURE DIAL COUNTERCLOCKWISE TO LOWEST SETTING.
4. WAIT FIVE (5) MINUTES TO CLEAR OUT ANY GAS. IF YOU THEN SMELL GAS, STOP! FOLLOW "B" IN THE SAFETY INFORMATION ABOVE ON THIS LABEL. IF YOU DON'T SMELL GAS, GO TO THE NEXT STEP.
5. REMOVE BOTH THE OUTER DOOR AND INNER DOOR FROM THE WATER HEATER.
6. FOLLOW THE METAL TUBE FROM GAS CONTROL THRU DOOR OPENINGS. THE PILOT IS LOCATED ON THE HORIZONTAL LEG OF THE LARGER TUBE (OR BURNER).



7. TURN THE GAS COCK KNOB COUNTER CLOCKWISE TO "PILOT" POSITION.
8. PUSH DOWN ON THE "GAS COCK KNOB" UNTIL IT COMES TO REST ON THE TOP OF CONTROL. HOLD "GAS COCK KNOB" DOWN AND LIGHT THE PILOT WITH A MATCH. CONTINUE TO HOLD THE"GAS COCK KNOB" IN FOR ABOUT ONE (1) MINUTE AFTER THE PILOT IS LIT RELEASE KNOB AND IT WILL POP BACK UP. PILOT SHOULD REMAIN LIT. IF IT GOES OUT, REPEAT STEPS 2 THROUGH 8.
   - IF THE KNOB DOES NOT POP UP WHEN RELEASED, STOP AND IMMEDIATELY CALL YOUR SERVICE TECHNICIAN OR GAS SUPPLIER.
   - IF THE PILOT WILL NOT STAY LIT AFTER SEVERAL TRIES, TURN THE "GAS COCK KNOB" TO "OFF" AND CALL YOUR SERVICE TECHNICIAN OR GAS SUPPLIER.
9. REPLACE INNER AND OUTER DOORS.
10. TURN "GAS COCK KNOB" COUNTER CLOCKWISE TO "ON".
11. TURN THE TEMPERATURE DIAL TO THE DESIRED SETTING.

TO TURN OFF GAS TO APPLIANCE

1. TURN TEMPERATURE DIAL COUNTERCLOCKWISE TO LOWEST SETTING.
2. TURN GAS COCK KNOB CLOCKWISE TO "OFF POSITION.

Operation

Before operating this water heater, be sure to read and follow the instructions on the label pictured below and all other labels on the water heater, as well as the warnings printed in this manual. Failure to do so can result in unsafe operation of the water heater resulting in property damage, bodily injury, or death. Should you have any problems reading or following the instructions in this manual, STOP, and get help from a qualified person.

2. PIEZO SYSTEM LIGHTING PROCEDURE - Lighting procedures are outlined on the label pictured below. This label is also located on the water heater near the thermostat.

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 a piezoelectric igniter which lights the pilot. When lighting the pilot, follow these instructions exactly.

B. BEFORE LIGHTING smell all around the appliance area for gas. Be sure to smell next to the floor because some gas is heavier than air and will settle on the floor.

WHAT TO DO IF YOU SMELL GAS:

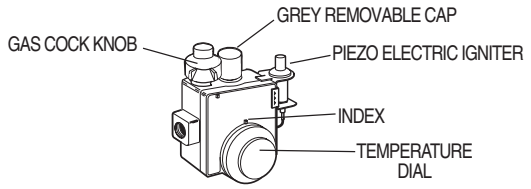
- Do not try to light the appliance.
- Do not touch any electrical switch; do not use any phone in your building.
- Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
- If you cannot reach your gas supplier, call the fire department

C. Use only your hand to turn the gas control knob. Never use tools. If the knob will not turn by hand, don't try to repair it, call a qualified service technician. Force or attempt to repair may result in a fire or explosion.

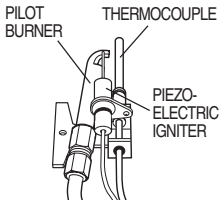
D. Do not use this appliance if any part has been under water. Immediately call a qualified service technician to inspect the applaince and to replace any part of the control system and any gas control which has been under water.

LIGHTING INSTRUCTIONS

1. **STOP!** READ THE SAFETY INFORMATION ABOVE ON THIS LABEL.
2. TURN THE GAS COCK KNOB CLOCKWISE ↘ TO "OFF" POSITION.



3. TURN THE TEMPERATURE DIAL COUNTER CLOCKWISE ↙ TO LOWEST SETTING.
4. WAIT FIVE (5) MINUTES TO CLEAR OUT ANY GAS. IF YOU THEN SMELL GAS, STOP! FOLLOW "B" IN THE SAFETY INFORMATION ABOVE ON THIS LABEL. IF YOU DON'T SMELL GAS, GO TO THE NEXT STEP.
5. REMOVE BOTH THE OUTER DOOR AND INNER DOOR FROM THE WATER HEATER.
6. FOLLOW THE METAL TUBE FROM GAS CONTROL THRU DOOR OPENINGS. THE PILOT IS LOCATED ON THE HORIZONTAL LEG OF THE LARGER TUBE (OR BURNER).



7. TURN THE GAS COCK KNOB COUNTER CLOCKWISE ↙ TO "PILOT" POSITION.
8. PUSH DOWN THE "GAS COCK KNOB" UNTIL IT COMES TO REST ON THE TOP OF CONTROL. HOLD "GAS COCK KNOB" DOWN AND IMMEDIATELY DEPRESS THE PIEZOELECTRIC IGNITER UNTIL YOU HEAR A LOUD CLICK. REPEAT IMMEDIATELY IF PILOT DOES NOT LIGHT ON THE FIRST TRY. IF THE PILOT DOES NOT LIGHT BY THE FOURTH ATTEMPT, REPEAT STEPS 2 THROUGH 8. AFTER THE PILOT IS LIT, CONTINUE TO HOLD THE "GAS COCK KNOB" IN FOR ABOUT ONE (1) MINUTE . RELEASE KNOB AND IT WILL POP BACK UP. PILOT SHOULD REMAIN LIT. IF IT GOES OUT, REPEAT STEPS 2 THROUGH 8.
   - IF KNOB DOES NOT POP BACK UP WHEN RELEASED, STOP AND IMMEDIATELY CALL YOUR SERVICE TECHNICIAN OR GAS SUPPLIER.
   - IF THE PILOT WILL NOT STAY LIT AFTER SEVERAL TRIES, TURN THE "GAS COCK KNOB" TO "OFF" AND CALL YOUR SERVICE TECHNICIAN OR GAS SUPPLIER.
9. REPLACE INNER AND OUTER DOORS.
10. TURN "GAS COCK KNOB" COUNTER CLOCKWISE ↙ TO "ON".
11. TURN TEMPERATURE DIAL TO THE DESIRED SETTING.

TO TURN OFF GAS TO APPLIANCE

1. TURN TEMPERATURE DIAL COUNTER CLOCKWISE ↙ TO LOWEST SETTING.
2. TURN GAS COCK KNOB CLOCKWISE ↘ TO "OFF" POSITION

Operation

SAFETY PRECAUTIONS

A. ***Do*** turn off manual gas shut-off valve if water heater has been subjected to over heating, fire, flood, physical damage or if gas supply fails to shut off.

B. ***Do Not*** turn on water heater unless it is filled with water.

C. ***Do Not*** turn on water heater if cold water supply shut-off valve is closed.

D. ***Do Not*** store or use gasoline or other flammable vapors and liquids, such as adhesives or paint thinner, in vicinity of this or any other appliance. If such flammables must be used, open doors and windows for ventilation, and all gas burning appliances in vicinity should be shut off, including their pilot lights, to avoid vapors igniting.

NOTE: Flammable vapors may be drawn by air currents from surrounding areas to the water heater.

E. ***Do not*** allow combustible materials such as newspaper, rags or mops to accumulate near water heater.

F. If there is any difficulty in understanding or following the OPERATION or MAINTENANCE instructions, it is recommended that a qualified person or serviceman perform the work.

G. If your water heater is not equipped with a vent switch it may ONLY be installed in a room separated from living spaces and provided with appropriate ventilation directly to the outside.

⚠ CAUTION

Hydrogen gas can be produced in a hot water system served by this water heater that has not been used for a long period of time (generally two weeks or more). HYDROGEN GAS IS EXTREMELY FLAMMABLE!! To dissipate such gas and to reduce risk of injury, it is recommended that the hot water faucet be opened for several minutes at the kitchen sink before using any electrical appliance connected to the hot water system. If hydrogen is present, there will probably be an unusual sound such as air escaping through the pipe as the water begins to flow. *Do not* smoke or use an open flame near the faucet at the time it is open.

3. WATER TEMPERATURE SETTING— The temperature of the water in the heater can be regulated by setting the temperature dial on front of the thermostat. (Refer to Fig. 4.) The thermostat was set at its lowest setting before the water heater was shipped from the factory.

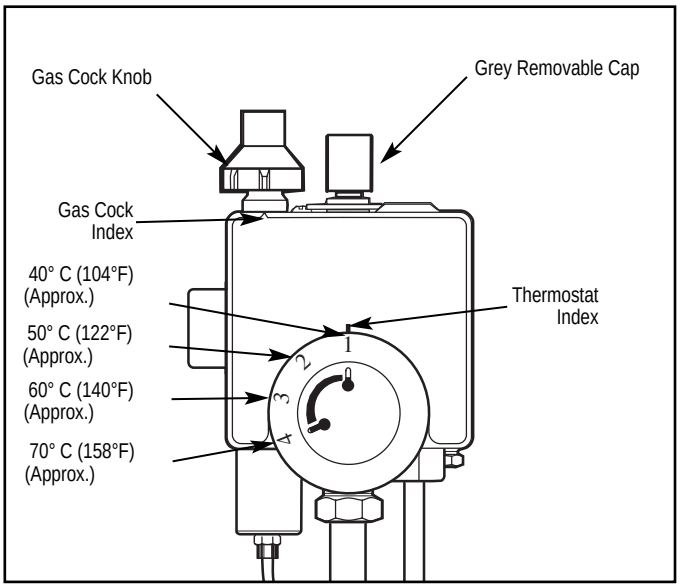


Figure 4 — Thermostatic Gas Valve.

Safety and energy conservation are factors to be considered when selecting the water temperature setting of water heater's thermostat. The lower the setting the greater the savings in energy and operating cost.

⚠ WARNING

NOTE: Low water temperatures can lead to bacterial growth, while high temperatures increase the risk of scalding and burns.

TIME / TEMPERATURE RELATIONSHIPS IN SCALDS

Temperature	Time to Produce Serious Burn
49° C (120° F)	More than 5 minutes
52° C (125° F)	1½ to 2 minutes
54° C (130° F)	About 30 seconds
57° C (135° F)	About 10 seconds
60° C (140° F)	Less than 5 seconds
63° C (145° F)	Less than 3 seconds
66° C (150° F)	About 1½ seconds
68° C (155° F)	About 1 second

Table courtesy of Shriners Burn Institute

Maximum water temperatures occur just after burner has shut off. To find hot water temperature being delivered, turn on a hot water faucet and place a thermometer in the hot water stream and read the thermometer.

Mixing valves for reducing point of use water temperature by mixing hot and cold water in branch water lines are available. Contact a licensed plumber or the local plumbing authority for further information.

4. ADJUSTMENTS— There are no user adjustments (other than water temperature selection) required on this water heater. The thermostatic valve is equipped for total regulation of the main burner and pilot gas pressures. The burner does not require adjustment.

HIGH ALTITUDE— Ratings of gas appliances are based on sea level operation and need not be changed for installations at elevations up to 609 m (2,000 feet). For installations above 609 m (2,000 feet), the input must be reduced per the local or national fuel gas code or equivalent regulation for each 304 m (1,000 feet) above sea level. Contact the local gas supplier for more information.

Operation

5. **SAFETY CONTROLS—** The thermostat is constructed with a built in safety shutoff device designed to shut off the gas supply to the burner in the event the pilot flame is extinguished for any reason. The thermostat is also equipped with a gas shut-off device that will shut off the gas supply to the burner, if the water in the water heater exceeds normal operating temperatures. Refer to the Troubleshooting Section of this manual, or contact your dealer for service.

6. **EMERGENCY SHUTDOWN—**

⚠ WARNING

Should overheating occur or the gas supply fail to shut off, turn off the manual gas control valve to the appliance.

If water heater has been subjected to fire, flood, or physical damage turn off the manual gas control (shut-off) valve, and do not operate the water heater again until it has been checked by qualified personnel.

NOTE: Replace any part of the gas control system which has been under water.

7. **CONDENSATION—** Condensation can form on the tank when it is first filled with cold water. The condensation might also occur with a heavy water draw and very cold inlet water. Drops of water falling on the burner can produce a sizzling or pinging sound, and water may also be seen beneath the water heater. This condition is not unusual, and will disappear after the water in the water heater becomes heated. If, however, the condition is continuous, examine the piping and fittings for possible leaks.

8. **VACATION AND LONG TIME SHUT-DOWN—** If the water heater is to remain idle for an extended period of time, the gas should be turned off to conserve energy. The water heater and piping should be drained if they might be subjected to freezing temperatures.

NOTE: Refer to Hydrogen Gas Caution, in Safety Precautions Section on page 11.

After a very long shut-down period, the water heater's operation and controls should be checked by qualified service personnel. Make certain the water heater is filled before again placing it in operation.

9. **DRAINING WATER HEATER—**

⚠ CAUTION

Shut off gas at thermostat gas cock or supply line manual shut-off valve before draining water from the water heater.

In order to drain water, turn off cold water supply, then it is necessary to open a hot water faucet or lift the handle on the relief valve to allow air to enter the tank. Attach a garden hose to the drain valve on the water heater and direct the stream of water to a drain where it will do no damage.

⚠ DANGER

The water drained from the tank may be hot enough to present a SCALD HAZARD and should be directed to a suitable drain to prevent injury or damage.

10. **ANODE—** This water heater is equipped with an anode rod designed to prolong the life of the glass lined tank. Refer to Fig. 3 for location. The anode rod is slowly consumed cathodically, thereby eliminating or minimizing corrosion of the glass lined tank. Water sometimes contains a high sulfate and/or mineral content and together with the cathodic protection process can produce a hydrogen sulfide or rotten egg odor in the heated water. Please contact a local plumber or qualified service personnel to correct this issue.

NOTE: Do not remove the anode-rod from the water heater's tank, except for inspection and/or replacement, as permanent removal will shorten the life of the glass lined tank and effect the water heater warranty.

Maintenance

Properly maintained, your water heater will provide years of dependable trouble free service. It is suggested that a regular routine maintenance program be established and followed by the user. It is further recommended that a periodic inspection of the thermostat, burner, relief valve, internal flueway and venting system should be made by service personnel qualified in gas appliance repair.

1. **ROUTINE PREVENTATIVE MAINTENANCE**

A. The water heater's internal flue must be inspected annually to be certain it is clean by removing the draft hood and flue baffle. (Refer to Fig. 2A.) When reinstalling the flue baffle make certain it is hung securely by its hanger at the top of the flue way. Remove any scale that may have fallen on the burner or floor shield. Reinstall the draft hood. Inspect gas venting system to make certain vent connector from draft hood to chimney is properly positioned and securely attached and inspect chimney. Replace any corroded through vent connector and remove any obstruction in vent connector or chimney.

B. Visually inspect the burner annually while firing and pilot burner flame with main burner off. (Refer to Figure 5 for normal flame pattern.) If any unusual burner operation is noted, the water heater should be shut off until qualified service assistance can be obtained. Please contact a local plumber or qualified service personnel to correct this issue.

For cleaning, remove the burner from the water heater. A vacuum cleaner can be used on the burner and floor shield inside the water heater. The burner can also be cleaned by scrubbing with mild detergent

C. The area near the water heater must be kept free of flammable liquids such as gasoline or paint thinners, adhesives and other combustible materials.

⚠ CAUTION

For your safety, cleaning of main burner should be performed ONLY by qualified service personnel, as it involves disconnection of gas piping and leak testing.

D. For adequate combustion (proper burner operation) and ventilation, make certain the flow of air to the water heater is not obstructed.

E. At least once a year, lift and release the lever handle on the temperature pressure relief valve, located near the top of the water heater, to make certain the valve operates freely and allow several liters to flush through discharge line. Make certain the discharged water is directed to an open drain.

Maintenance

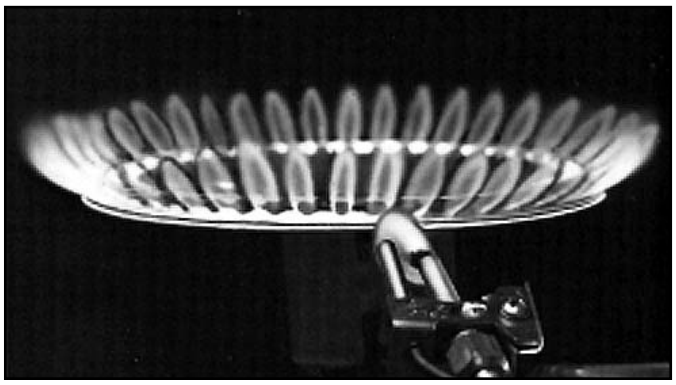


Figure 5. — Main Burner and Pilot Flame Pattern

⚠ DANGER

Before manually operating the relief valve, make certain no one will be exposed to the danger of coming in contact with the hot water released by this valve. The water may be hot enough to create a SCALD hazard. The water released should be directed to a suitable drain to prevent injury or damage.

NOTE: If the temperature and pressure relief valve on the water heater discharges periodically, this may be due to thermal expansion in a "Closed" water system. Contact the water supplier or your plumbing contractor on how to correct this. DO NOT plug the relief valve outlet.

F. A water heater's tank can act as a settling basin for solids suspended in the water. It is, therefore, not uncommon for hard water deposits to accumulate in the bottom of the tank. Deposits should not be allowed to accumulate as this can affect the service life of the water heater. It is suggested that a few quarts of water be drained from the water heater's tank every month. If sufficient hard water deposits accumulate, a rumbling or pounding sound can occur. There is no danger involved and the efficiency of the water heater is not seriously affected, but the noise can be annoying. Your plumbing contractor should be contacted to clean the tank of these deposits.

G. Rapid closing of faucets or solenoid valves in automatic water using appliances can cause a pounding "water hammer" sound. "Water hammer" can be described as a banging noise heard in a water pipe following an abrupt alteration of the flow with resulting pressure surges. Strategically located risers in the water pipe system can be used to minimize the problem. Also water hammer arresting devices are usually available from your plumber or local plumbing supply store.

2. **ANODE ROD INSPECTION—**The anode rod should be removed from the water heater's tank annually for inspection and replaced when more than 15 cm (6") of core wire is exposed at either end of the rod. Refer to Fig. 3 for anode rod location. Make certain cold water supply is turned off before removing anode rod. Please contact a local plumber or qualified service personnel to correct this issue.

How to Obtain Service Assistance

1. Should you have any questions about your new water heater, or if it requires adjustment, repair, or routine maintenance, it is suggested that you first contact your installer, plumbing contractor or previously agreed upon service agency. In the event that the firm has moved, or is unavailable, refer to the local utility for qualified service assistance.

2. Should your problem not be solved to your complete satisfaction, you should then contact the Manufacturer's National Service Department at: the following address:

   2600 Gunter Park Drive East
   Montgomery, Alabama U.S.A. 36109-1413
   xportsales@rheem.com

   When contacting the manufacturer, the following information should be made available:

A. Model and serial number of the water heater as shown on the rating plate attached to the jacket of the heater.
B. Address where water heater is located and can be seen.
C. Name and address of installer and any service agency who performed service on the water heater.
D. Date of original installation and dates any service work was performed.
E. Details of the problem as you can best describe them.
F. List of people, with dates, who have been contacted regarding your problem.

Replacement Parts List

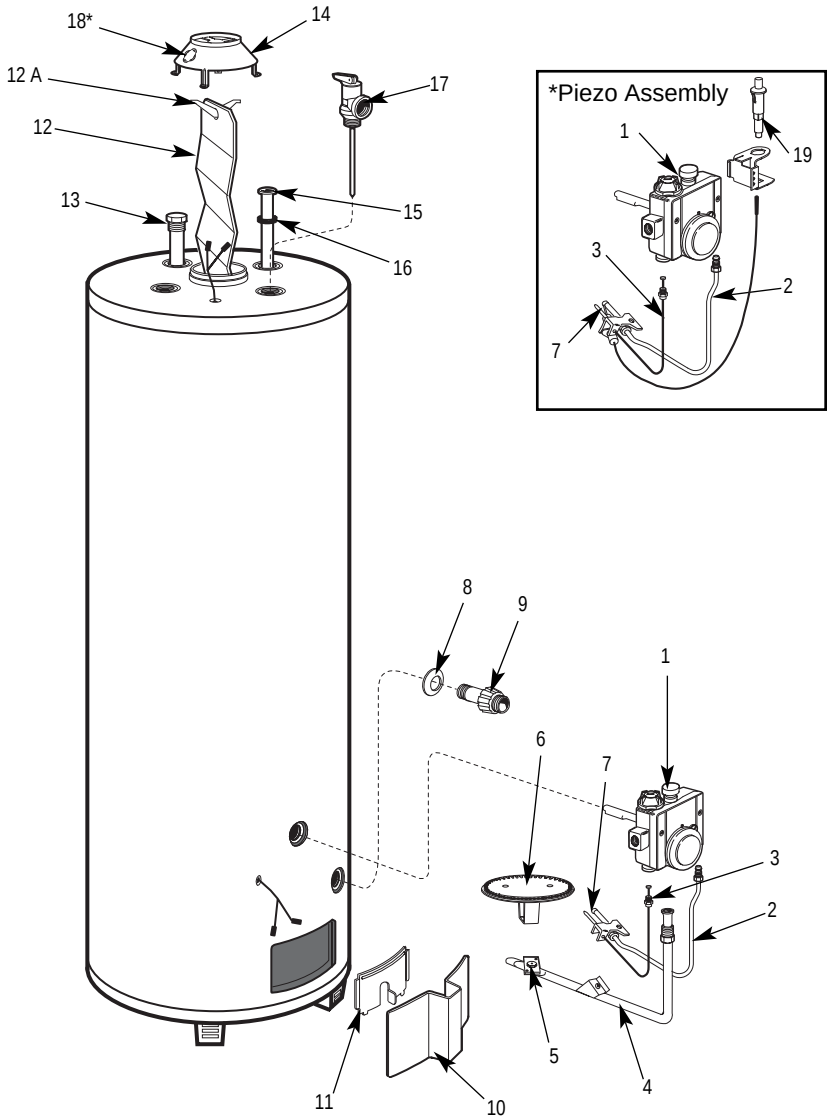
115, 150, 190, & 285 Liter Models Natural or LP Gas

Instructions for placing a Parts Order:

Address parts orders to the distributor or store from where the heater was purchased.

All parts orders should include:

1. Model number and Serial number of heater (from rating plate).
2. Specify type of gas (Natural, Propane, or Butane) as listed on rating plate.
3. Part Description (as noted below) and number of parts desired.



Ref. No.	Part Description	Qty. Req'd
1.	Thermostat	1
2.	Pilot Supply Tube	1
3.	Thermocouple	1
4.	Burner Supply Tube	1
5.	Burner Orifice	1
6.	Burner	1
7.	Pilot Burner	1
8.	Drain Valve Shroud	1
9.	Drain Valve	1
10.	Jacket Door	1
11.	Inner Door	1
12.	Flue Baffle	1
12A.	Flue Baffle Hanger	1
13.	Anode Rod	1
14.	Draft Hood	1
15.	Dip Tube	1
16.	Dip Tube Gasket	1
17.	T&P Relief Valve	1
18.*	Vent Switch	1
19.*	Piezo Igniter	1

* Optional Equipment

⚠ CAUTION

For your safety, DO NOT attempt repair of gas piping, thermostat, burners, vent connectors or other safety devices. Refer repairs to qualified service personnel.

Trouble Shooting Guide

NATURE OF TROUBLE	POSSIBLE CAUSE	SERVICE
Unable to light pilot	1. Gas knob dial not correctly positioned 2. Pilot orifice clogged 3. Pilot tube pinched or clogged 4. Air in gas line	Follow lighting instructions ** Clean or replace ** Clean, repair or replace ** Purge air from gas line
Pilot does not stay lit when gas cock knob . is released	1. Loose Thermocouple 2. Thermocouple breakdown 3. ECO tripped. 4. Safety magnet breakdown 5. Vent Switch/Circuit Breakdown a. Wire connection loose. b. Damaged vent switch. c. Down draft condition. d. Vent fully or partially blocked. e. Improper vent installation.	** Tighten connection at thermostat ** Replace thermocouple. Flush tank with cold water to reset ECO. ** Replace thermostat ** Reconnect wires. ** Replace vent switch. ** Correct downdraft conditions. ** Shut off heater and remove restrictions. ** Refer to vent installation section for proper installation.
Not enough hot water	1. Heater undersized 2. Low gas pressure	Reduce rate of hot water usage ** Check gas supply pressure and manifold pressure
Water too hot or not hot enough	1. Thermostat setting too high or low 2. Thermostat out of calibration 3. High water temperature followed by pilot outage	Change setting as required ** Replace ** Thermostat out of calibration, replace
Yellow flame Sooting	1. Scale on top of burner 2. Combustion air inlets or flueway restricted 3. Not enough combustion or ventilation air supplied to the room	Shut off heater and remove scale Remove lint or debris and inspect air inlet opening for restriction Refer to Sec. E in Introduction section of this manual
Rumbling noise	1. Scale or sediment in tank	Clean tank - See Maintenance, Sec. 1F
Rattling noise during periods of water usage	1. Heat Trap fittings in operation (If heater is equipped with these energy saving devices)	None. The rattling noise is normal for Heat Trap fittings when in operation and does not indicate a need for service.

⚠ CAUTION

**** For your safety, DO NOT attempt repair of thermostat, burners or gas piping. Refer repairs to qualified service personnel.**

Model No. _____ Serial No. _____ Date of Installation _____ Installed By: _____