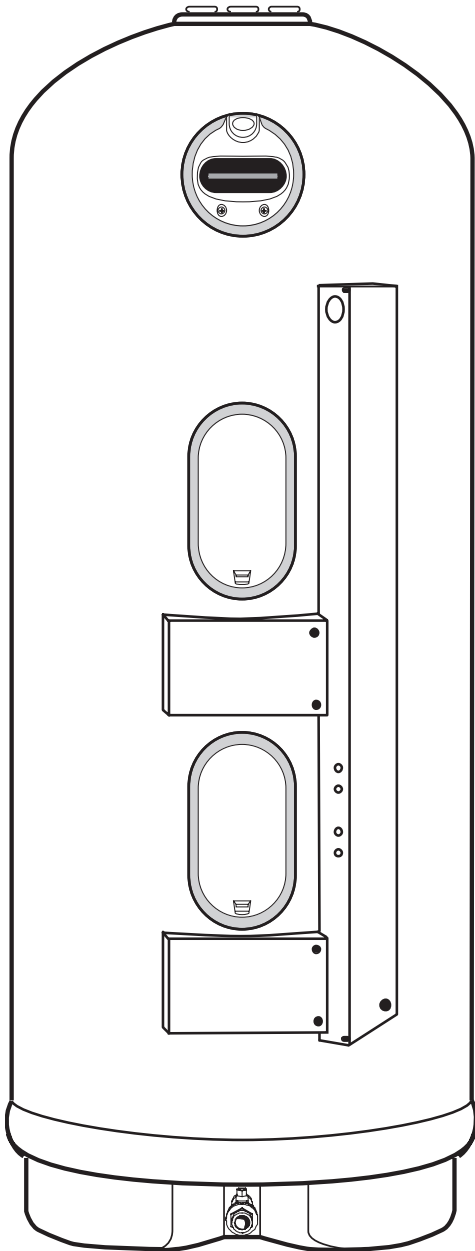


# Commercial Electric Water Heater

# USE & CARE MANUAL

WITH INSTALLATION INSTRUCTIONS FOR THE INSTALLER



The purpose of this manual is twofold: one, to provide the installing contractor with basic directions and recommendations for the proper installation and adjustment of the water heater; and two, for the owner-operator, to explain the features, operation, safety precautions, maintenance and trouble shooting of the water heater. This manual also includes replacement parts information.

It is imperative that all persons who are expected to install, operate or adjust this water heater read the instructions carefully so that they may understand how to perform these operations. If you do not understand these instructions or any terms within it, seek professional advice

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 "If You Need Service".



**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!**



**NOTICE:** This water heater is designed for use in a commercial application and the installation and maintenance of it should be performed by qualified, licensed service personnel. If the foregoing assumption is not appropriate, then we recommend that you obtain and retain our Residential Use & Care Manual.



**CALIFORNIA PROPOSITION 65 WARNING:** This product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

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## READ THE SAFETY INFORMATION

Your safety and the safety of others is very important. There are many important safety messages in this manual and on your appliance. Always read and obey all safety messages.



This is the safety alert symbol. Recognize this symbol as an indication of Important Safety Information! This symbol alerts you to potential hazards that can kill or hurt you and others.

All safety messages will follow the safety alert symbol and either the word “DANGER”, “WARNING”, “CAUTION” or “NOTICE”.

These words mean:



**DANGER**

An imminently hazardous situation that will result in death or serious injury.



**WARNING**

A potentially hazardous situation that could result in death or serious injury and/or damage to property.



**CAUTION**

A potentially hazardous situation that may result in minor or moderate injury.

**Notice:** Attention is called to observe a specified procedure or maintain a specific condition.



## 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 serious 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 local utility.

To meet commercial water use needs, the surface mounted thermostats on this water heater are adjustable to deliver 170°F for the 85 gallon and 105 gallon models. However, water temperatures over 125°F can cause severe burns instantly or death from scalds. This is the preferred starting point for setting the control for supplying general purpose hot water.

Safety and energy conservation are factors to be considered when

hot water stream and read the thermometer.

The following chart details the relationship of water temperature and time with regard to scald injury and may be used as a guide in determining the safest water temperature for your applications.

The temperature of the water in the heater can be regulated by adjusting the thermostats. To comply with safety regulations both

TIME / TEMPERATURE RELATIONSHIPS IN SCALDS

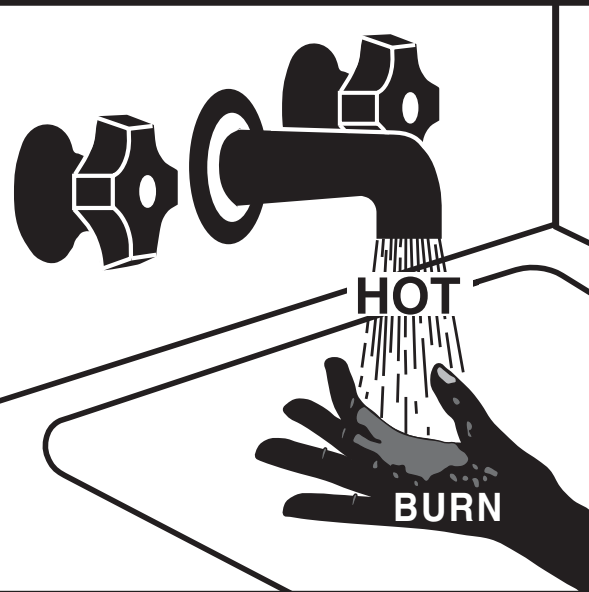
| Temperature | Time to Produce Serious Burn |
|-------------|------------------------------|
| 120° F      | More than 5 minutes          |
| 125° F      | 1 1/2 to 2 minutes           |
| 130° F      | About 30 seconds             |
| 135° F      | About 10 seconds             |
| 140° F      | Less than 5 seconds          |
| 145° F      | Less than 3 seconds          |
| 150° F      | About 1 1/2 seconds          |
| 155° F      | About 1 second               |

Table courtesy of Shriners Burn Institute

thermostats were set at the factory to a setting corresponding to 120°F. The illustration below pictures the thermostats used on the water heater covered in this manual and how to adjust the water temperature.

Hotter water increase the Potential for Hot Water SCALDS.

DANGER



**Water temperature over 125°F can cause severe burns instantly or death from scalds.**

**Children, disabled and elderly are at highest risk of being scalded.**

**See instruction manual before setting temperature at water heater.**

**Feel water before bathing or showering.**

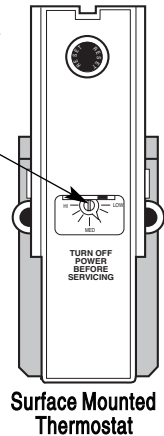
**Temperature limiting valves are available, see manual.**

setting the water temperature on the thermostat. The most energy efficient operation will result when the temperature setting is the lowest that satisfies the needs consistent with the application.

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

To adjust the water temperature on Surface Mounted Thermostat, insert a small straight screwdriver into slotted screw of indicator and move indicator to desired setting. See Operation Section of this Manual for details.

**⚠ DANGER — Hotter water increases the Potential for Hot Water SCALDS.**



Surface Mounted Thermostat

### ⚠ DANGER

**NOTICE:** When this water heater is supplying general purpose hot water requirements for use by individuals, a thermostatically controlled mixing valve for reducing point of use water temperature is recommended to reduce the risk of scald injury. Contact a licensed plumber or the local plumbing authority for further information.

# Introduction

## WARNING

Read and Review this entire Manual with special emphasis on the Installation Section (Pages 4 - 8) and Operation Section (Pages 10 - 11) prior to any installation work.

*The factory installed vacuum valve on this water heater is an essential part of the product and must remain on the heater as provided.*

**LOCAL INSTALLATION REGULATIONS**—This water heater must be installed in accordance with these instructions, local codes, utility company requirements, and/or in the absence of local codes, the latest edition of the American National Standard / National Electrical Code. A copy of which can be purchased from the National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02269 as booklet NFPA 70.

## LOCATION

- A. The water heater should be installed in a clean, dry location as close as practical to the area of greatest hot water demand. 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 an outdoor, unprotected area.
- B. 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.

**NOTICE:** Auxiliary catch pan installation **MUST** conform to the applicable local codes.

Make certain the floor underneath the water heater is strong enough to sufficiently support the weight of the water heater once it is filled with water.

- C. **FOR THE TANK TYPE MODELS,** the minimum distance to provide adequate clearance for protection of combustible material is 0 inches from jacket and 18 inches from access door. However, additional clearance for accessibility to permit inspection and servicing such as removing heating elements or checking controls must be provided. All models are approved for installation on combustible flooring.

## D. RESTAURANT INSTALLATION:

If the water heater is to be installed in a restaurant, or other location where NSF International listing is required, it must be weather sealed to the floor, a raised base, or shelf so that seepage cannot accumulate under it; or elevated to provide at least (6) inches of clearance from the floor.

In order to meet NSF International requirements for Standard 5, the base of the water heater must be sealed to the floor to prevent seepage underneath. Apply a 3/8" bead of RTV Silicone completely around the floor edge of the base of the tank.

# Installation

## WARNING

The manufacturer's warranty does not cover any damage or defect caused by installation, or attachment or use of any special attachment such as energy saving devices (other than those authorized by the manufacturer) into, onto, or in conjunction with the water heater. The use of such unauthorized 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.

1. **INSPECT SHIPMENT**—for possible damage. The manufacturer's responsibility ceases upon delivery of goods to the carrier in good condition. Any claims for damage, shortage in shipments, or non-delivery must be filed immediately against carrier by consignee.
2. **THERMAL EXPANSION** — Determine if a check valve exists 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.

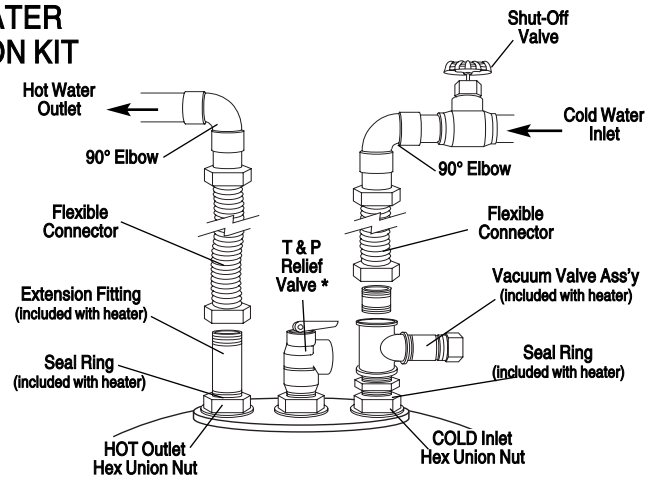
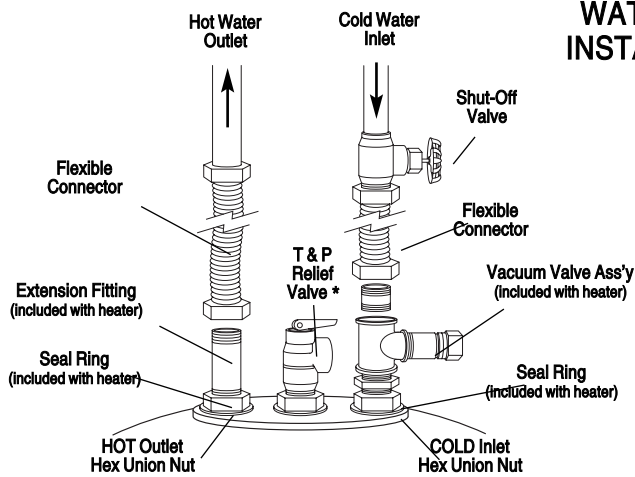
A "closed water system", however, prevents the expanding water from flowing back into the main supply line, and the result of "thermal expansion" can create a rapid, and dangerous pressure increase in the water heater and system piping. This rapid pressure increase can quickly reach the safety setting 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. 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 valve. Other methods of controlling thermal expansion are also available. Contact your installing contractor, water supplier, or plumbing inspector for additional information regarding this subject.

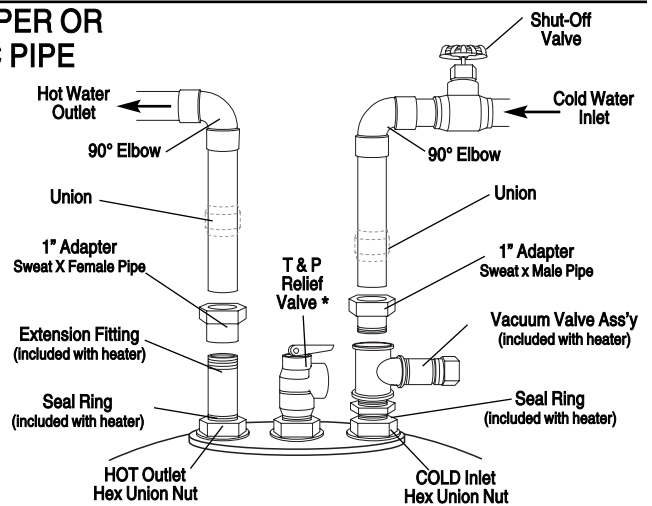
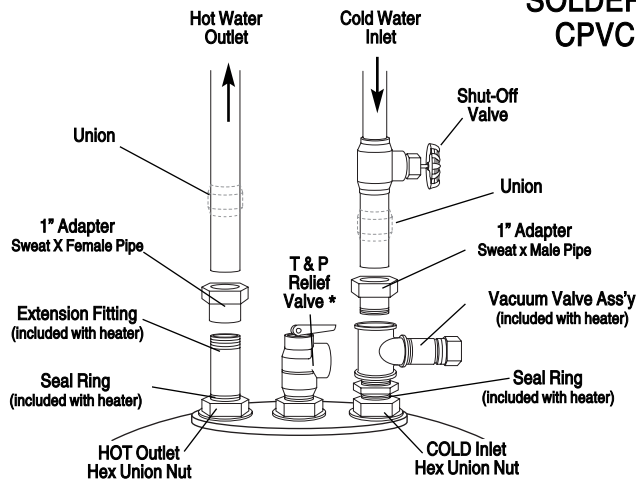
If a recirculation line is installed, the return connection should be made to a tee close to the inlet connection on the water heater. A check

# Installation

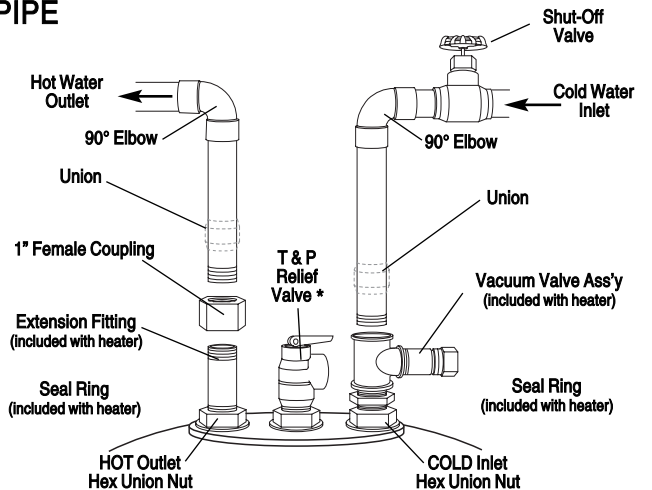
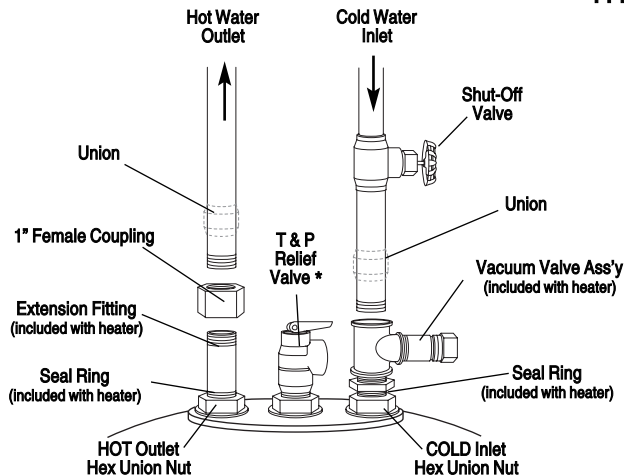
## WATER HEATER INSTALLATION KIT



## SOLDERED COPPER OR CPVC PLASTIC PIPE



## THREADED PIPE



**CAUTION: DO NOT SWEAT SOLDER DIRECTLY TO THE WATER HEATER HEX UNION NUTS AS SOLDERING TORCH HEAT WILL DAMAGE THE WATER HEATER BEYOND REPAIR.**

\* See Temperature & Pressure (T & P) Relief Valve section for drain pipe installation details.

Figure 2 — Typical installation methods using Water Heater Installation Kit (top), Soldered Copper or CPVC Pipe (center), or Threaded Pipe (bottom).

# Installation

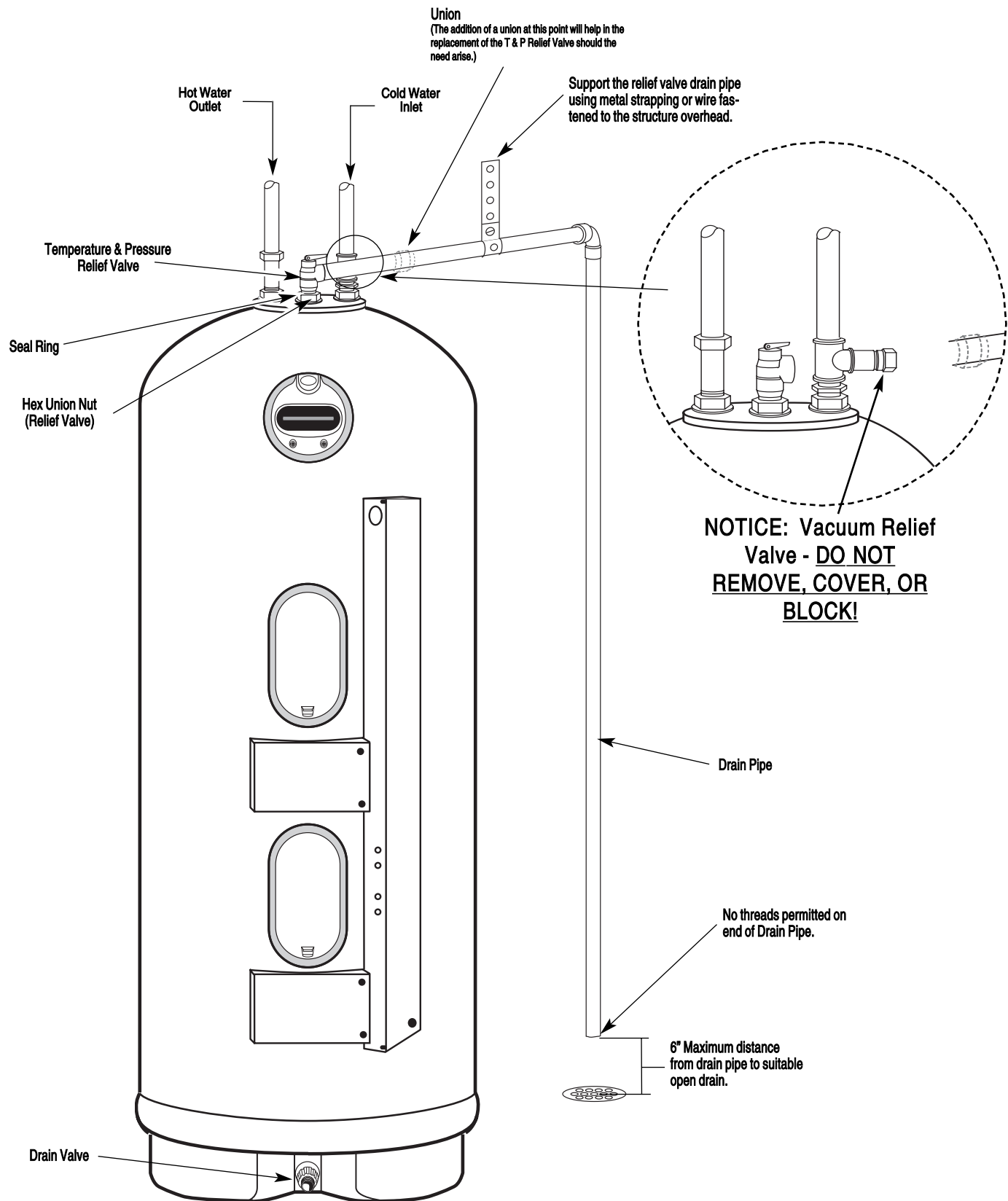


Figure 1. — Typical Installation and Method of Supporting Relief Valve Drain Pipe.

# Installation

valve should always be installed in the recirculation line to prevent cold water from entering.

- 3. WATER CONNECTIONS**—This heater may be connected individually in multiples with others, or with an external hot water storage tank. It may also be used to boost the temperature of preheated water.

**NOTICE:** If the incoming water pressure is over 80 PSI, be sure to install a pressure reducing valve (water pressure regulator) somewhere in the inlet water line upstream of the water heater.

**NOTICE:** DO NOT remove the vacuum valve for any reason. Doing so will void the manufacturer's warranty!

Inlet and outlet water connections are clearly marked next to the connections on the heater. Use only clean, new galvanized steel, copper or approved plastic for pipe for water connections. Local codes shall govern the exact type of material to be used. The installation of unions on the inlet and outlet water lines and a shut-off valve in at least the cold water line is recommended so the water heater may be easily disconnected for servicing. Dielectric unions are not required for protection of the water heater.

**IMPORTANT!!** Do not apply heat directly to the plumbing connections at the top of this water heater. If sweat connections are used, sweat tubing to connectors and allow to cool before fitting connectors to the brass fittings at the top of the heater. ANY HEAT APPLIED OR TRANSFERRED FROM THE COPPER PIPE AND CONNECTORS TO THE HOT AND COLD BRASS WATER FITTINGS CAN PERMANENTLY DAMAGE THE TANK.

The connection between the vacuum valve and the water heater uses a seal ring. If unions are not used on the water heater supply lines, the vacuum valve can be removed from the heater to accommodate final connection to supply piping. The hex union fitting on the water heater can then be used to make the connection between the tank and the valve/supply piping. Remember to use the seal ring provided with the water heater when re-installing the vacuum valve and water inlet piping. DO NOT use pipe sealant on this joint!

**IMPORTANT!** – DO NOT attempt to turn the pipe or fittings after the hex union nuts are tightened. *Doing so will damage the water heater beyond repair!*

When this water heater is supplying general purpose hot water requirements for use by individuals, a thermostatically controlled mixing valve is recommended to reduce the risk of scald injury. Contact a licensed plumber or the local plumbing authority for further information.

Thermometer(s) should be installed to indicate the temperature of the water at or near the outlet of the water heater and storage tank(s) if provided. See Fig. 1 or 2.

- 4. RELIEF VALVE** — A new combination pressure and temperature relief valve, complying with the Standard for Relief Valves and Automatic Gas Shutoff Devices for Hot Water Supply Systems, ANSI Z21.22, is factory installed on this water heater at the time

of manufacture. No valve is to be placed between the relief valve and the water heater. For a circulating tank installation, the separate storage tank(s) must have similar protection. Local codes shall govern the installation of relief valves.

The pressure rating of the relief valve must not exceed 150 psi, the maximum working pressure of the water heater as marked on the rating plate. The Btu/h rating of the relief valve must not be less than the input rating of the water heater as indicated on the rating plate located on the front of the heater. (1 watt = 3.412 Btu/h).

Connect the outlet of the relief valve to a suitable open drain so that the discharge water cannot contact live electrical parts. The discharge line must pitch downward from the valve to allow complete draining (by gravity) of the relief valve and discharge line and be no smaller than the outlet of the valve. 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. Local codes shall govern the installation of relief valves.

Following all of the above rules, install the drain valve discharge piping, using thread sealer on all male threads.

- 5. DRAIN VALVE** — The drain valve is factory installed. If required, to face the drain valve outlet in a different direction, loosen the union hex nut, position drain valve outlet as desired, and retighten union hex nut.

**NOTICE:** DO NOT attempt to turn the drain valve without first loosening the union hex nut. Doing so could damage the water heater beyond repair.

- 6. 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.

**Tank MUST be full of water before power is turned ON. Heating elements and the tank WILL BE DAMAGED if energized for even a short time while tank is dry. The water heater's**

## WARNING

warranty does not cover damage or failure resulting from operation with an empty or partially empty tank. (Refer to the Certificate of Limited Warranty for complete terms and conditions.)

- 7. ELECTRICAL CONNECTIONS & WIRING** — The water heater is completely internally wired to the field connection terminal block. Check the rating plate of the water heater to power supply for correct voltage and phase.

Provide a separate branch circuit with overcurrent protective device and suitable disconnecting means for each water heater. Refer to Table 1 on following page for minimum branch circuit sizing.

Water heater internal wiring diagrams are located in the back of this manual.

# Installation

| kW   | Phase | Recommended       |       |       |       | 208 Volt |          |          |          | 240 Volt |          |          |          | 277 Volt |          |          |          | 480 Volt |          |          |          |
|------|-------|-------------------|-------|-------|-------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
|      |       | Over Current      |       |       |       |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |
|      |       | Protection Rating |       |       |       | Copper   |          | Aluminum |          | Copper   |          | Aluminum |          | Copper   |          | Aluminum |          | Copper   |          | Aluminum |          |
|      |       | 208 V             | 240 V | 277 V | 480 V | Wire Ga. | Con-duit | Wire Ga. | Con-duit | Wire Ga. | Con-duit | Wire Ga. | Con-duit | Wire Ga. | Con-duit | Wire Ga. | Con-duit | Wire Ga. | Con-duit | Wire Ga. | Con-duit |
| 12.4 | 1     | 80                | 70    | 60    | 35    | 4        | 1        | 3        | 1 1/4    | 6        | 1        | 4        | 1        | 6        | 1        | 4        | 1        | 10       | 1/2      | 8        | 3/4      |
|      | 3     | 50                | 45    | x     | 25    | 8        | 1        | 6        | 1        | 8        | 1        | 6        | 1        | x        | x        | x        | x        | 12       | 1/2      | 10       | 1/2      |
| 18   | 1     | 110               | 100   | 90    | 50    | 2        | 1 1/4    | 1/0      | 1 1/2    | 3        | 1 1/4    | 1        | 1 1/4    | 4        | 1        | 2        | 1 1/4    | 8        | 3/4      | 6        | 1        |
|      | 3     | 80                | 70    | x     | 35    | 4        | 1 1/4    | 3        | 1 1/4    | 6        | 1        | 4        | 1 1/4    | x        | x        | x        | x        | 10       | 1/2      | 8        | 1        |
| 24   | 1     | 150               | 125   | 110   | 70    | 1/0      | 1 1/2    | 3/0      | 2        | 1        | 1 1/4    | 2/0      | 1 1/2    | 2        | 1 1/4    | 1/0      | 1 1/2    | 6        | 1        | 4        | 1        |
|      | 3     | 100               | 90    | x     | 45    | 3        | 1 1/4    | 1        | 1 1/4    | 1/4      | 1 1/4    | 2        | 1 1/4    | x        | x        | x        | x        | 8        | 1        | 6        | 1        |

**Table 1. — Minimum Branch Circuit and Wire Sizing Guide. Based on N.E.C. ANSI / NFPA 70 - 1993; Article 422-4(a); Article 240-6(a); Chapter 9, Table 3A; and Table 310-16 (Based on 75°C Type THW wire)**

## 8. GROUNDING—

The presence of water in the piping and water heater does not provide sufficient conduction for a ground. Nonmetallic piping, dielectric unions, flexible connections, Etc., can cause the water heater to be electrically isolated.

The branch circuit should include either:

### CAUTION

- A. Metallic conduit or metallic sheathed cable approved for use as a grounding conductor and installed with fittings approved for the purpose.
- B. Nonmetallic sheathed cable, or metallic conductor or metallic sheathed cable not approved for use as a grounding conductor, shall include a separate conductor for grounding. It shall be connected to the grounding means of the water heater (1/4" green screw) and that of the electrical distribution box. Terminate stranded grounding conductors with suitable pressure connectors.

## ALUMINUM WIRE CONNECTIONS

When aluminum wire is used for electrical supply leads, it is advisable to check the field terminal connections of a new installation twenty-four hours after the heater has been placed in service for possible need to retighten. Torque specs are marked on the terminal block.

The water heater tank is insulated with 2 1/2" of foam insulation to

stop heat loss. More insulation is not needed. DO NOT install an insulating blanket.

If local codes require external application of insulation blanket kits the manufacturer's instructions included with the kit must be carefully followed.

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

- Do not cover the temperature and pressure relief valve.
- Do not cover jacket access panels to thermostats and heating elements.
- Do not cover electrical junction box of water heater.
- Do not cover operating or warning labels attached to the water heater nor attempt to relocate them on exterior of insulation blanket.

### 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.

# Installation Check List

## A. Water Heater Location

- ☐ Close to area of heated water demand.
- ☐ Indoors and protected from freezing temperatures.
- ☐ Area free of flammable vapors.
- ☐ Provisions made to protect area from water damage.
- ☐ Sufficient room to service water heater.

## B. Water Supply

- ☐ Water heater completely filled with water.
- ☐ Air purged from water heater and piping.

- ☐ Water connections tight and free of leaks

## C. Relief Valve

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

## D. Wiring

- ☐ Power supply voltage agrees with water heater rating plate.
- ☐ Branch circuit wire and fusing or circuit breaker of proper size.
- ☐ Electrical connections tight and unit properly grounded.

Model No. \_\_\_\_\_ Serial No. \_\_\_\_\_ Date of Installation \_\_\_\_\_ Installed By: \_\_\_\_\_

# Operation

## SAFETY PRECAUTIONS

- A. **Do** turn off power to water heater if it has been subjected to over heating, fire, flood or physical damage.
- 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. 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.

### TO PLACE WATER HEATER IN OPERATION:

#### **CAUTION**

**Make certain tank is completely filled with water before placing the water heater in operation. (Refer to Installation Section of this manual)**

This unit is equipped with a "Dry Fire Protection Switch" located near the terminal block in the electrical compartment. The switch should be in the "Protect" position, which isolates the elements from the power supply, when installing or working on the unit. Before placing the switch in the "Normal" position, to operate the elements, make certain the tank is completely filled with water. Failure to do this could result in damage to the tank and elements.

#### **WARNING**

Placing the "Dry Fire Protection Switch" in the "Protect" position only isolates the elements from the electrical power. All other parts will still be "LIVE". Turn off the main power to the water heater before removing or opening any covers.

1. **WATER TEMPERATURE SETTING** — To comply with safety regulations and reduce the risk of scald injury, the thermostat(s) of the water heater has been set at the factory to a setting corresponding to 120° F. This is the preferred starting point for setting the control for general purpose hot water. To meet commercial water needs for dishwasher rinse applications and other commercial purposes, where water temperatures are needed beyond the upper limit of this water heater, a Booster heater may be re-

#### **WARNING**

quired.  
**Water temperatures over 125° F can cause severe burns instantly or death from scalds.**

It is recommended that the thermostats remain at the factory setting for most normal applications. All water temperature adjustments should be made at both thermostats.

Safety and energy conservation are factors to be considered when setting the water temperature on the thermostat. The most energy efficient operation will result when the temperature setting is the

#### **DANGER**

lowest that satisfies the needs consistent with the application.

**Hotter water increases the Potential for Hot Water SCALDS.**

**NOTICE: When this water heater is supplying general purpose hot water requirements for use by individuals, a thermostatically controlled mixing valve for reducing point of use water temperature is recommended to reduce the risk of scald injury. Contact a licensed plumber or the local plumbing authority for further information.**

Outlet water temperatures will vary during normal operating cycles. Reliable temperature readings should be taken shortly after the thermostat(s) cycle off during a period of little or no use.

If water temperature other than 120° F is needed, the following instructions will apply.

#### **DANGER**

**Be certain power to the water heater is turned OFF before adjusting temperature setting of thermostat.**

The upper thermostat controls the upper two heating elements. The lower thermostat controls the lower two heating elements. The lower two elements provide recovery while the upper two elements assist with larger demands for water. They are located behind the removable pad of glass fiber insulation in the control compartment.

Adjust thermostat dial pointer, with a small screwdriver, to the desired water temperature setting (refer to Fig. 3). **THERMOSTAT PROTECTIVE COVER SHOULD NOT BE REMOVED.** The thermostat is adjustable from a "LOW" to "HI" setting. An approximate

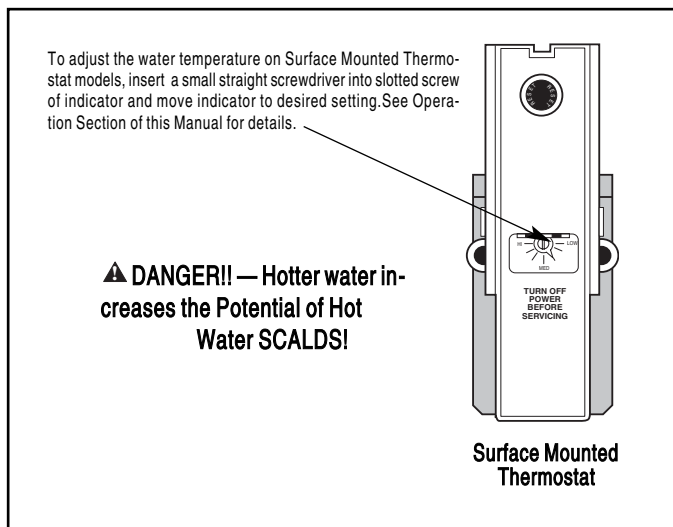


Figure 3. — Thermostat Adjustment

# Operation

water temperature of 140° F is accomplished when the temperature dial pointer is in the "MED" position. Each mark above and below the "MED" position indicates an approximate 10° F change in water temperature.

Replace insulation, close access door and turn power "ON", and the water heater is operational.

**NOTICE: A thermometer(s) installed at or near the outlet of the water heater and/or storage tank(s) will result in the most accurate outlet water temperature measurement.**

2. **HIGH TEMPERATURE LIMIT CONTROL** — Surface Thermostats are equipped with a manual reset high temperature limiting control(s). If for any reason the water temperature becomes excessively high, The High Temperature Limit Control breaks the power to the heating elements. Once this control opens, it must be manually reset.

## CAUTION

The cause of the high temperature condition must be investigated by qualified service personnel and corrective action taken before placing the water heater in service again.

**TO RESET HIGH TEMPERATURE LIMIT CONTROL:**  
Be certain the power supply to the water heater is turned

## WARNING

"OFF" before attempting to reset the Limit Control.

**NOTE: Allow the water in the tank to cool before resetting the High Temperature Limit Control.**

On Surface Mounted Thermostat models, press the red "RESET" button located above the thermostat (refer to Fig. 3). The thermostat protective cover **SHOULD NOT** be removed.

### 3. EMERGENCY INSTRUCTIONS —

If the water heater has been subjected to flood, fire, or physical damage, turn off power and water to water heater. Do not

## WARNING

operate the water heater again until it has been thoroughly checked by qualified service personnel.

4. **LONG TIME SHUT-DOWN** — If the water heater is to remain idle for an extended period of time (60 days or more), the power and water to the water heater should be turned off to conserve energy. Place the "Dry Fire Protection" switch in the "Protect" position to prevent accidental dry-fire during start-up. The water heater and piping should be drained if they might be subjected to freezing temperatures. It is recommended that the water heater's operation and controls should be checked by qualified service personnel, before putting it in service again.

## WARNING

**Make certain the water heater is completely filled. Then place "Dry Fire Protection" switch in normal position before again placing it in operation.**

### 5. DRAINING HEATER —

Be sure that the power to the water heater is shut off

## CAUTION

before draining water.

The water drained from the tank may be hot enough to pre-

## CAUTION

sent a SCALD HAZARD and should be directed to a suitable drain to prevent injury or damage.

In order to drain this water heater, be certain to turn OFF power at the service panel before turning OFF the cold water supply. **Before opening the drain valve, it is necessary to admit air into the tank.** OPEN a hot water faucet and leave it OPEN until the tank is completely drained, or lift the handle on the relief valve until it is completely drained. **DO NOT USE A PUMP TO DRAIN THE TANK, UNLESS THE WATER HEATER IN THE TANK HAS BEEN COMPLETELY COOLED DOWN. TO DO THIS, TURN OFF THE POWER AT THE SERVICE PANEL AND RUN WATER AT A HOT FAUCET UNTIL IT RUNS COMPLETELY COLD. TURN OFF THE WATER SUPPLY AND OPEN A HOT FAUCET TO ADMIT AIR INTO 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.

# Maintenance

Properly maintained, this water heater will provide years of dependable, trouble free service. It is strongly suggested that a regular routine maintenance program be established and followed by the owner. It is further recommended that a periodic inspection of the relief valve and electrical controls be made by service personnel qualified in electric appliance repair.

## CAUTION

**Make certain all power to the water heater is turned "OFF" before performing any maintenance or inspection work on this water heater.**

1. **ELECTRICAL CONNECTIONS** — Periodic inspection of all electrical connections at the service terminal block, fuse holders, contactors, thermostats and elements should be performed to make certain all connections are tight. If the electrical supply leads used are aluminum, particular attention should be given to the branch circuit connections at the heater's terminal block. It is advisable to retighten the field terminal connections of aluminum conductors twenty-four hours after the water heater was first placed in service. Torque specs are marked on the terminal block.

**NOTICE: On surface mounted thermostat models, make certain insulation is carefully replaced and tucked in before placing heater in operation. Also check the thermostat to be certain that the mounting screws are tightened making good contact with the thermostat mounting plate.**

2. **FUSES** — Any replacement fuses should be of the same UL Class and type as the originals. The amp rating of the element circuit fuses may be reduced on those models not having high amperage elements.
3. **HEATING ELEMENTS** — The life of elements can be extended in hard water areas by removing the scale build up. Cleaning can be accomplished by scraping or soaking in a de-scaling solution. Care should be taken so the protective plating is not damaged by scraping or dissolved by excessive soaking.

**Be certain all power to the water heater is turned "OFF" and**

## CAUTION

**tank has been completely drained before removing elements for cleaning.**

Whenever an element is removed from the tank for cleaning or replacement, a new gasket should be installed to prevent a possible water leak. Refer to parts information in this manual for replacement gasket information. The elements are easily unscrewed with a 1-7/8" socket wrench.

4. **RELIEF VALVE** — The Temperature and Pressure Relief Valve must be free to operate properly. Check operation (at least once a year) by lifting the handle fully and allowing several gallons of water to flush through the discharge line. Make certain the discharged water is directed to a suitable drain.

## 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.**

**NOTICE: 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 local plumbing inspector on how to correct this. DO NOT plug the relief valve outlet.**

5. **TANK** — Good maintenance requires that the tank be cleaned of deposits. Unless the water supply is very soft (0 to 5 grains hardness), scale or lime deposits will accumulate in the tank. Hard water scale is deposited at an increasingly high rate in proportion to increased water temperature, and accumulation of these deposits may reduce efficiency and shorten the life of the water heater.

## CLEANING THE TANK:

The water heater is not supplied with a clean-out provision on the tank. To remove accumulated deposits from the tank, it is suggested that a few gallons of water be drained from the water heater's tank through the drain valve every month to remove those deposits.

6. **SEASONAL OPERATION** — If the water heater is to remain idle for an extended period of time (60 days or more) the power to the heater should be turned off. The water heater and piping should be drained if they might be subjected to freezing temperatures. It is recommended that the water heater's operation is thoroughly checked (by qualified personnel) before it is placed back in service.

7. **GENERAL** — Periodic cleaning of the equipment is recommended. Turn off power to heater. Remove any lint or dust that may block the free passage of air through the control compartment. Do not allow combustible materials such as newspapers, rags or mops to accumulate near the water heater.

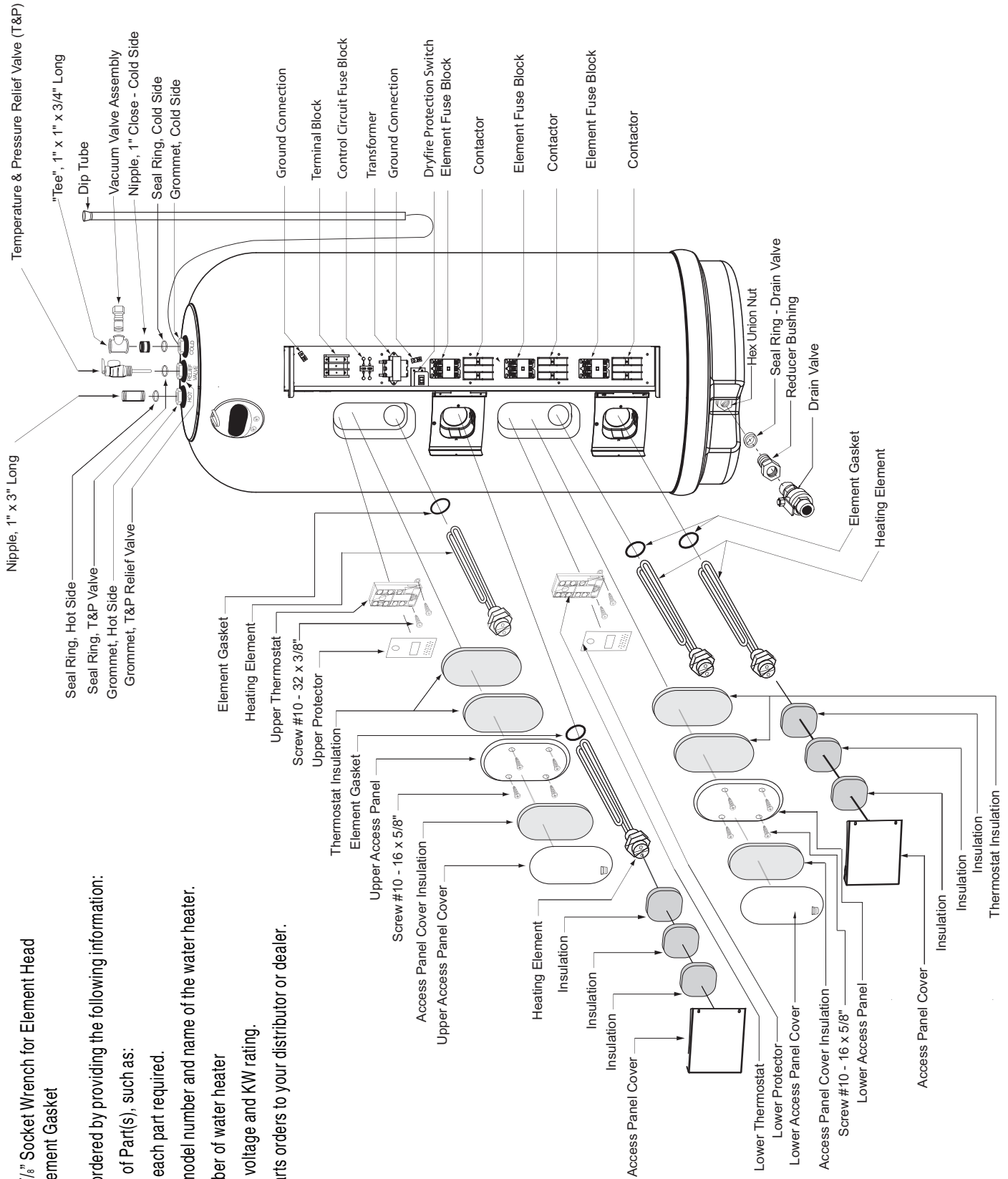
# Replacement Parts

The following Parts are required for Normal Maintenance for all Models:

- SP610070 1 7/8" Socket Wrench for Element Head
- SP310060 Element Gasket

All other Parts can be ordered by providing the following information:

1. Description of Part(s), such as:
2. Quantity of each part required.
3. Complete model number and name of the water heater.
4. Serial Number of water heater
5. Specify the voltage and KW rating.
6. Address Parts orders to your distributor or dealer.



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## System Sentinel® System

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This water heater is supplied with the System Sentinel® System. The system consists of an element diagnostic panel utilizing light emitting diodes (L.E.D.). The L.E.D.'s are lit only when the thermostat(s) is calling for element operation. This diagnosis system has L.E.D.'s corresponding to the number and location of heating elements and are energized when the elements are operating. An unlit L.E.D. pinpoints the exact location of a non-functioning element, making element operation diagnosis simple and positive.

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## How to Obtain Service Assistance

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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 telephone directory commercial listings or 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  
Montgomery, Alabama 36109-1413  
Phone: 1-800-432-8373.

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

- a. Model and serial numbers 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.

### CAUTION

\* For your safety, DO NOT attempt repair of Thermostats, High Limit Controls or any other control component. Refer repairs to qualified service personnel.

## Wiring Diagram: Surface Mounted Thermostat Models With Staging -G Models 4 Element Models Only

FIELD WIRING BLOCK

