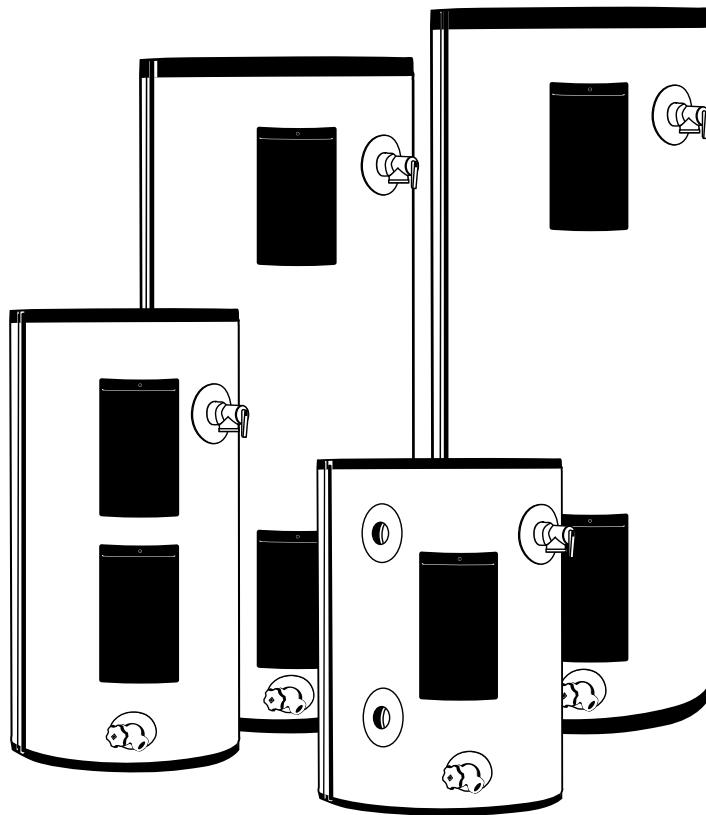


# Residential Electric Water Heater Installation Instructions and Use & Care Guide

To obtain technical, warranty or service assistance during or after the installation of this water heater, call toll free 1-800-999-9515.

When calling for assistance, please have the following information ready:

1. Model number
2. 7 Digit product number
3. Serial number
4. Date of installation
5. Place of Purchase



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# WATER HEATER SAFETY

## Your safety and the safety of others are very important.

We have provided many important safety messages in this manual and on your appliance. Always read and obey all safety messages.



This is the safety alert symbol.

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" or "WARNING." These words mean:

**! DANGER**

Indicates an imminently hazardous situation which, if not avoided, will result in death or injury.

**! WARNING**

Indicates a hazardous situation which, if not avoided, could result in death or serious injury.

All safety messages will tell you what the potential hazard is, tell you how to reduce the chance of injury, and tell you what can happen if the instructions are not followed.

## Important Safety Instructions

**CAUTION:** Hydrogen gas is produced in a hot water system served by this heater that has not been used for a long period of time (2 weeks or more). Hydrogen gas is extremely flammable. To reduce the risk of injury under these conditions, 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. When hydrogen is present, there will probably be an unusual sound such as air escaping through the pipe as the water begins to flow. There should be no smoking or open flame near the faucet at the time it is open.

The California Safe Drinking Water and Toxic Enforcement Act requires the Governor of California to publish a list of substances known to the State of California to cause cancer, birth defects, or other reproductive harm, and requires businesses to warn of potential exposure to such substances.

**WARNING:** This product contains a chemical known to the State of California to cause cancer, birth defects, or other reproductive harm.

This appliance can cause low-level exposure to some of the substances included in the Act.

# INSTALLING YOUR WATER HEATER

## Consumer Information

This water heater should be installed in accordance with the local code authority having jurisdiction, the power company or electric utility, and this installation manual. In the absence of local code requirements, follow the regulations set forth in the current edition of The National Electric Code, NFPA 70. This is available from the following:

National Fire Protection Association  
1 Batterymarch Park  
Quincy, MA 02269

American National Standards Institute  
1430 Broadway  
New York, NY 10018

Check your phone listings for the local authorities having jurisdiction over your installation.

## Consumer Responsibilities

This manual has been prepared to acquaint you with the installation, operation and maintenance of your electric water heater and to provide important safety information in these areas.

We urge you to read all of the instructions thoroughly before attempting the installation or operation of this water heater. This manual should be kept for future reference.

The manufacturer of this water heater will not be liable for any damages caused by failure to comply with the installation and operating instructions outlined in this manual.

If you lack the necessary skills required to properly install this water heater or you have difficulty following the directions, you should not proceed but have a qualified person perform the installation of this water heater.

Examples of a qualified person include: licensed plumbers, authorized gas company personnel, and authorized service personnel.

Massachusetts code requires this water heater to be installed in accordance with Massachusetts 248-CMR 2.00: State Plumbing Code and 248-CMR 5.00.

A data plate identifying your water heater can be found adjacent to the element door. When referring to your water heater always have the information listed on the data plate readily available.

Retain your original receipt as proof of purchase.

## Unpacking the Water Heater

### ! WARNING

#### Excessive Weight Hazard

**Use two or more people to move and install water heater.**

**Failure to do so can result in back or other injury.**

## Removing Packaging Materials

**IMPORTANT:** Do not remove any permanent instructions, labels, or the data label from either the outside of the water heater or on the inside of water heater panels.

- Remove exterior packaging and place installation components aside.
- Inspect all parts for damage prior to installation and start-up.
- Completely read all instructions before attempting to assemble and install this product.
- After installation, dispose of/recycle all packaging materials.

# Location Requirements

## Site location

Select a location near the center of the water piping system. It must be installed indoors and in a vertical position on a level surface.

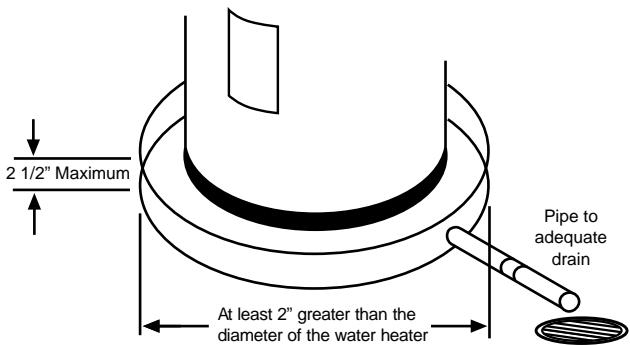
The water heater should be located in an area not subject to freezing temperatures. Water heaters located in unconditioned spaces (i.e., attics, basements, etc.) May require the water piping and drain piping to be insulated to protect against freezing. The drain and controls must be easily accessible for operation and service.

Keep combustibles such as boxes, magazines, clothes, etc., away from the water heater area.

This water heater does not have sufficient capacity for use with a spa or hot tub.

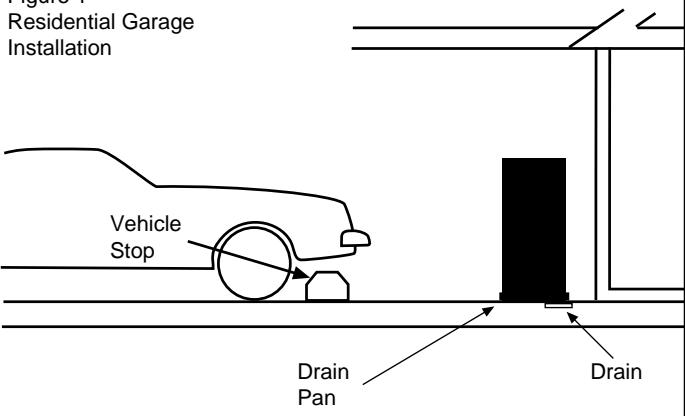
NOTE: Local codes and requirements in your area may require the installation of your water heater be accomplished in a way that the bottom element is elevated from the floor at least 18 inches.

**IMPORTANT:** The water heater should be located in an area where leakage of the tank or connections will not result in damage to the area adjacent to the water heater or to lower floors of the structure. Due to the normal corrosive action of the water, the tank will eventually leak after an extended period of time. Also any external plumbing leak, including those from improper installation, may cause early failure of the tank due to corrosion if not repaired. If the owner/operator is uncomfortable with making the repair a qualified person should be contacted. A suitable drain pan should be installed under the water heater as shown below, to help protect the property from damage which may occur from leaks in the piping connections or tank. The pan must limit the water level to a maximum depth of 2-1/2 inches and be two inches wider than the heater and piped to an adequate drain. Locate the water heater near a suitable indoor drain. Outside drains are subject to freezing temperatures which can obstruct the drain line. The piping should be at least 3/4" ID and pitched for proper drainage. Under no circumstance will the manufacturer or seller of this water heater be held liable for any water damage which is caused by your failure to follow these instructions.



NOTE: The water heater shall be located so it is not subject to physical damage by moving vehicles or area flooding.

Figure 1  
Residential Garage  
Installation



## State of California

NOTE: The water heater must be braced, anchored, or strapped to avoid moving during an earthquake. Contact local utilities for code requirements in your area or call 1-800-999-9515 and request instructions.

# Electrical Requirements

## !WARNING



### Electric Shock Hazard

**Disconnect power before servicing.**

**Replace all parts and panels before operating.**

**Failure to do so can result in death or electrical shock.**



### Fire Hazard

**Use proper size solid copper wire.**

**Use a UL listed or CSA approved strain relief.**

**Connect ground wire to green ground screw.**

**Failure to do so can result in death, fire, or electrical shock.**

If you lack the necessary skills required to properly install the electrical wiring to this water heater, do not proceed but have a qualified electrician perform the installation.

When making the electrical connections, always make sure:

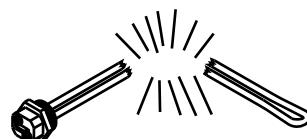
- The electrical supply has the proper overload fuse or breaker protection.
- Wire sizes and connections comply with all applicable codes.
- Wiring enclosed in approved conduit (if required by local codes).
- The water heater and electrical supply are properly grounded.

Figures 3, 4, and 5 are provided as reference drawings for the 120/240v 2-wire models only. Always reference the wiring diagram located on the water heater for the correct electrical connections and connect the electrical supply to the water heater in accordance with local utility requirements and codes.

When installing the electrical wiring to the water heater:

1. Be sure tank is completely filled with water before making any electrical connections. (See Figure 2)
2. Disconnect the electric power.
3. Loosen the screw holding the junction box cover to the top of the water heater and set aside.
4. Connect the electrical supply to the water heater. A standard 1/2 inch opening has been made in the junction box for conduit connections.
5. Connect ground wire to green ground screw in the junction box of the water heater. Reinstall the junction box cover.

Figure 2  
Heating Element



NOTE: Applying electrical power to elements that are not submerged in water will destroy them. The manufacturer will not warranty any elements damaged in this manner.

Figure 3  
120/240V 2-Wire Models

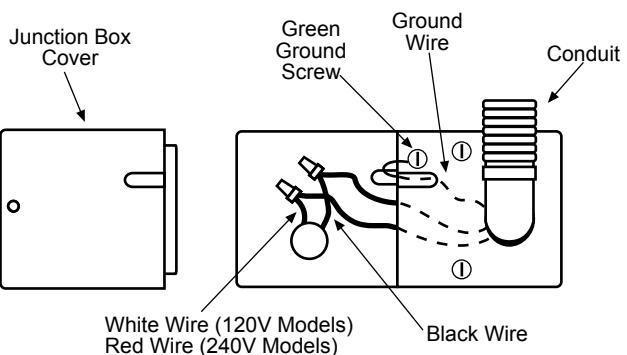


Figure 4  
Wiring Diagram  
120V Models Only

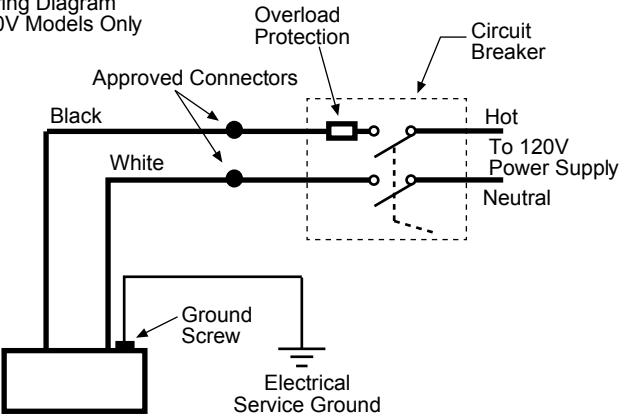
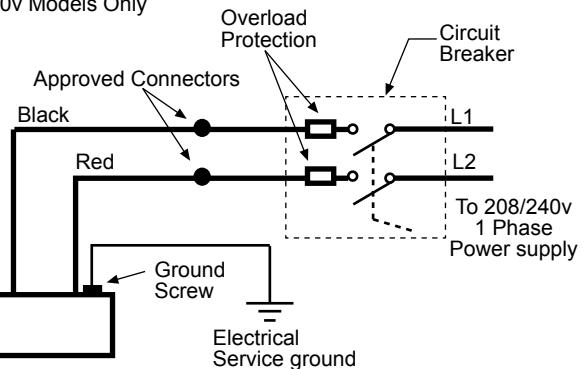


Figure 5  
Wiring Diagram  
208/240v Models Only



# Water System Piping

Piping, fittings, and valves should be installed according to the installation drawing (Figure 6). If the indoor installation area is subject to freezing temperatures, the water piping must be properly insulated.

The water supply pressure should not exceed 80 psi. If this occurs, a pressure reducing valve with a bypass should be installed in the cold water supply line. This should be placed on the supply to the entire house in order to maintain equal hot and cold water pressures.

## IMPORTANT:

- Heat must not be applied to the water fittings on the heater as they may contain nonmetallic parts. If solder connections are used, solder the pipe to the adapter before attaching the adapter to the hot and cold water fittings.
- Always use a good grade of joint compound and be certain that all fittings are tight.

## Piping Installation

1. Install the water piping and fittings as shown in Figure 6. Connect the cold water supply (3/4" NPT) to the fitting marked "C". Connect the hot water supply (3/4" NPT) to the fitting marked "H".  
**IMPORTANT:** Some models may contain energy saving heat traps to prevent the circulation of hot water within the pipes. Do not remove these inserts.
2. The installation of unions in both the hot and cold water supply lines are recommended for ease of removing the water heater for service or replacement.
3. Some local codes may require, and the manufacturer of this water heater recommends, installing a mixing valve or an anti-scald device in the domestic hot water line as shown in Figures 7 and 8. These valves reduce the point-of-use temperature of the hot water by mixing cold and hot water and are readily available. Contact a licensed plumber or the local plumbing authority for more information.
4. If installing the water heater in a closed water system, install an expansion tank in the cold water line as specified under "Closed System/Thermal Expansion."
5. Install a shut off valve in the cold water inlet line. It should be located close to the water heater and be easily accessible, but **not** located between the water heater and expansion tank. Know the location of this valve and how to shut off the water to the heater.
6. Install a temperature and pressure relief valve and discharge line in the opening marked "T & P RELIEF VALVE". Install as specified under "Temperature and Pressure Relief Valve."
7. After piping has been properly connected to the water heater, open the nearest hot water faucet and allow the tank to completely fill with water. To purge the lines of any excess air and sediment, keep the hot water faucet open for 3 minutes after a constant flow of water is obtained. Close the faucet and check all connections for leaks.

Figure 6  
Water Piping Installation

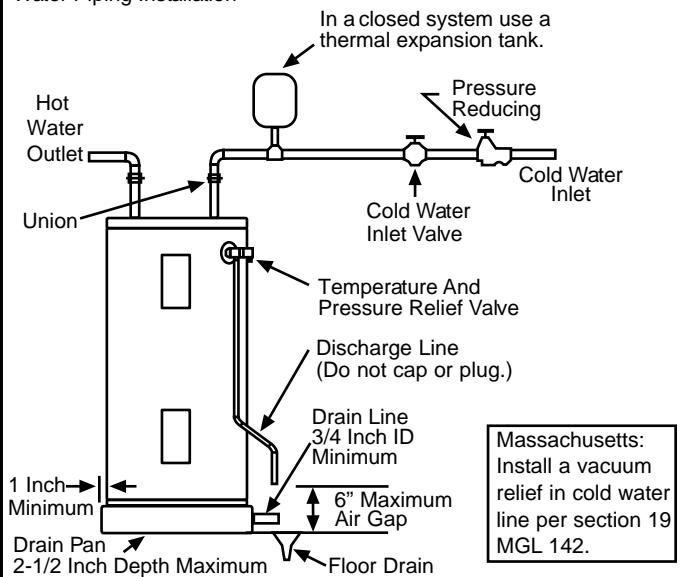


Figure 7  
Mixing Valve  
Side Water Connections

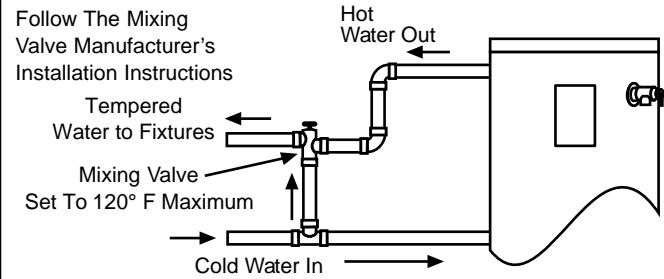
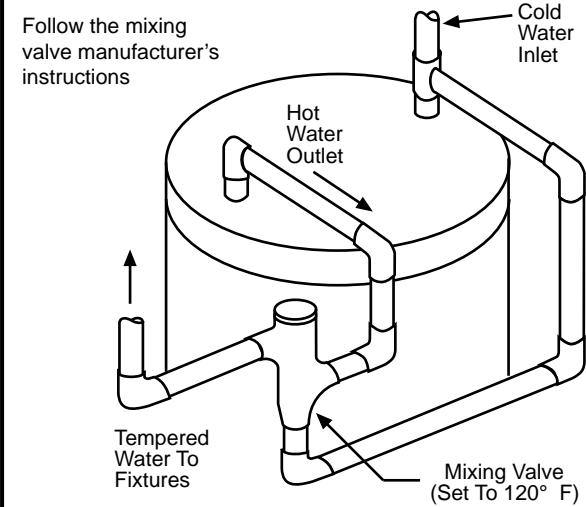


Figure 8  
Mixing Valve  
Top Water Connections

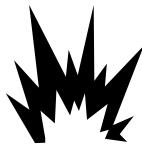


Please note the following:

- The system should be installed only with piping that is suitable for potable (drinkable) water such as copper, CPVC, or polybutylene. This water heater must not be installed using iron piping or PVC water piping.
- Use only pumps, valves, or fittings that are compatible with potable water.
- Use only full flow ball or gate valves. The use of valves that may cause excessive restriction to water flow is not recommended.
- Use only 95/5 tin-antimony or other equivalent solder. Any lead based solder must not be used.
- Piping that has been treated with chromates, boiler seal, or other chemicals must not be used.
- Chemicals that may contaminate the potable water supply must not be added to the piping system.

## Closed System/Thermal Expansion

### WARNING



#### Explosion Hazard

If the temperature and pressure relief valve is dripping or leaking, have a qualified person replace it.

Examples of a qualified person include: licensed plumbers, authorized gas company personnel, and authorized service personnel.

Do not plug valve.

Do not remove valve.

Failure to follow these instructions can result in death or explosion.

As water is heated, it expands (thermal expansion). In a closed system, the volume of water will grow. As the volume of water grows, there will be a corresponding increase in water pressure due to thermal expansion. Thermal expansion can cause premature tank failure (leakage). This type of failure is not covered under the limited warranty.

Thermal expansion can also cause intermittent temperature-pressure relief valve operation: water discharged from the valve due to excessive pressure build up. The temperature-pressure relief valve is not intended for the constant relief of thermal expansion. This condition is not covered under the limited warranty.

A properly-sized thermal expansion tank should be installed on all closed systems to control the harmful effects of thermal expansion. Contact a plumbing service agency or your retail supplier regarding the installation of a thermal expansion tank.

**IMPORTANT:** Do not plug or remove the temperature and pressure relief valve.

## Temperature and Pressure Relief Valve

### WARNING



#### Explosion Hazard

If the temperature and pressure relief valve is dripping or leaking, have a qualified person replace it.

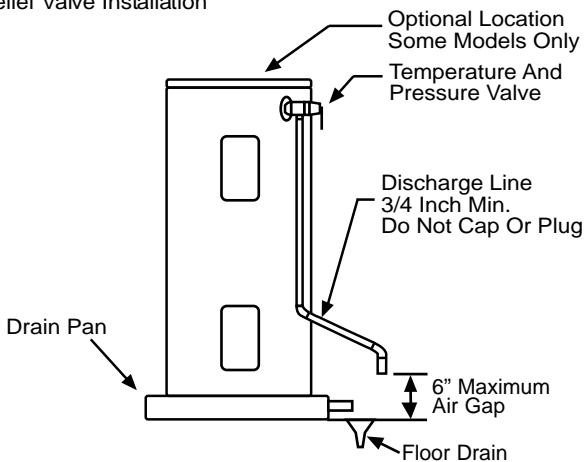
Examples of a qualified person include: licensed plumbers, authorized gas company personnel, and authorized service personnel.

Do not plug valve.

Do not remove valve.

Failure to follow these instructions can result in death or explosion.

Figure 9  
Temperature And Pressure  
Relief Valve Installation



For protection against excessive pressures and temperatures, a temperature and pressure relief valve must be installed in the opening marked "T & P RELIEF VALVE" (See Figure 9).

**CAUTION:** To reduce the risk of excessive pressures and temperatures in this water heater, install temperature and pressure relief protective equipment required by local codes, but no less than a combination temperature and pressure relief valve certified by a nationally recognized testing laboratory that maintains periodic inspection of the production of listed equipment or materials, as meeting the requirements for Relief Valves and Automatic Shutoff Devices for Hot

Water Supply Systems, ANSI Z21.22 - current edition. This valve must be marked with the maximum set pressure not to exceed the marked maximum working pressure of the water heater. Install the valve into an opening provided and marked for this purpose in the water heater, and orient it or provide tubing so that any discharge from the valve exits only within 6 inches above, or at any distance below, the structural floor, and does not contact any live electrical part. The discharge opening must not be blocked or reduced in size under any circumstance.

**IMPORTANT:** Only a new temperature and pressure relief valve should be used with your water heater. Do not use an old or existing valve as it may be damaged or not adequate for the working pressure of the new water heater. Do not place any valve between the relief valve and the tank.

#### **The Temperature & Pressure Relief Valve:**

- Shall not be in contact with any electrical part.
- Shall be connected to an adequate discharge line.
- Shall not be rated higher than the working pressure shown on the data plate of the water heater.

#### **The Discharge Line:**

- Shall not be smaller than the pipe size of the relief valve or have any reducing coupling installed in the discharge line.
- Shall not be capped, blocked, plugged or contain any valve between the relief valve and the end of the discharge line.
- Shall terminate a maximum of 6 inches above a floor drain or external to the building. In cold climates, it is recommended that the discharge pipe be terminated at an adequate drain inside the building.
- Shall be of material listed for hot water distribution.
- Shall be installed to allow complete drainage of both the valve and discharge line.

#### **Solar Installation**

If this water heater is used as a solar storage heater or as a backup for the solar system, the inlet water supply temperatures to the water heater tank may be in excess of 120°F. A mixing valve or other temperature limiting valve must be installed in the inlet water supply line to limit the supply temperature to 120°F.

**NOTE:** Solar water heating systems can often supply water with temperatures exceeding 180°F and may result in water heater malfunction.

# **INSTALLATION CHECKLIST**

## **Water Heater Location**

- Centrally located with the water piping system.
- Located indoors and in a vertical position. Protected from freezing temperatures.
- Provisions made to protect the area from water damage. A suitable drain pan installed and piped to an adequate drain.
- Sufficient room to service the water heater.

## **Water System Piping**

- Temperature and pressure relief valve properly installed with a discharge line run to an open drain and protected from freezing.
- All piping properly installed and free of leaks.
- Heater completely filled with water. (See Figure 2)
- Closed system pressure buildup precautions installed.
- Mixing valve (when applicable) installed per manufacturer's instructions (see "Water Temperature Regulation" section).

## **Electrical Connections**

- Wiring and connections comply with all applicable codes.
- Water heater and electrical supply are properly grounded.
- Proper overload fuse or circuit breaker protection installed.

# OPERATING YOUR WATER HEATER

## Before Using

1. Make sure the water heater has been properly installed. See "Installing Your Water Heater" section.
2. Completely fill the tank with water. (See Figure 2)
3. After the water heater tank is completely filled with water, connect electrical power to the water heater.
4. Read the "Water Temperature Regulation" section of this manual. If the instructions are not clear, contact a qualified person.
5. Adjust the thermostat to the desired temperature setting as described under "Adjusting the Thermostat/High Limit Control" section.

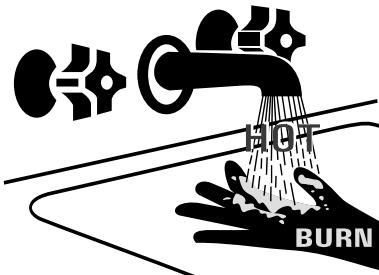
**IMPORTANT:** Do not attempt to operate this water heater if the thermostat(s), or surrounding insulation has been exposed to water in any way. Immediately call a qualified person to inspect the water heater and replace any thermostat or insulation that has been exposed to water. Do not attempt to repair these parts. Water heaters subjected to flood conditions or any time the thermostat(s) have been submerged in water require replacement of the entire water heater.

## Safety Shut-off

This water heater is designed to automatically shut-off in the event that the water temperature exceeds 170°F or 77°C (190°F or 88°C in LDCE Models). A high limit control switch is used to shut off the power to the elements if the water temperature exceeds 170°F or 77°C (190°F or 88°C in LDCE Models). The high limit control can be reset by firmly pushing in the red reset button located on the thermostat. Follow the instructions under "Adjusting the Thermostat/High Limit Control", section to properly reset the high limit control. If the high limit control switch continues to shut-off the water heater contact a qualified person for service.

## Water Temperature Regulation

### **WARNING**



**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.**

**Feel water before bathing or showering.**

**Temperature limiting valves are available.**

The thermostat is adjusted to a temperature setting of 120°F or lower when it is shipped from the factory. Water temperature can be regulated by adjusting the thermostat to the preferred setting as shown in "Adjusting the Thermostat/High Limit Control." The preferred starting point is 120°F. There is a hot water scald potential if the thermostat is set too high.

**IMPORTANT:** Adjusting the thermostat past 120°F on the thermostat will increase the risk of scald injury in the times shown below.

Water Temperature °F	Time for 1st Degree Burn (Less Severe Burns)	Time for Permanent Burns 2nd & 3rd Degree (Most Severe Burns)
110	(normal shower temp.)	
116	(pain threshold)	
116	35 minutes	45 minutes
122	1 minute	5 minutes
131	5 seconds	25 seconds
140	2 seconds	5 seconds
149	1 second	2 seconds
154	instantaneous	1 second

(U.S. Government Memorandum, C.P.S.C., Peter L. Armstrong, Sept. 15, 1978)

**NOTE:** During low demand periods when hot water is not being used, a lower thermostat setting will reduce energy losses and may satisfy your normal hot water needs. If hot water use is expected to be more than normal, a higher thermostat setting may be required to meet the increased demand.

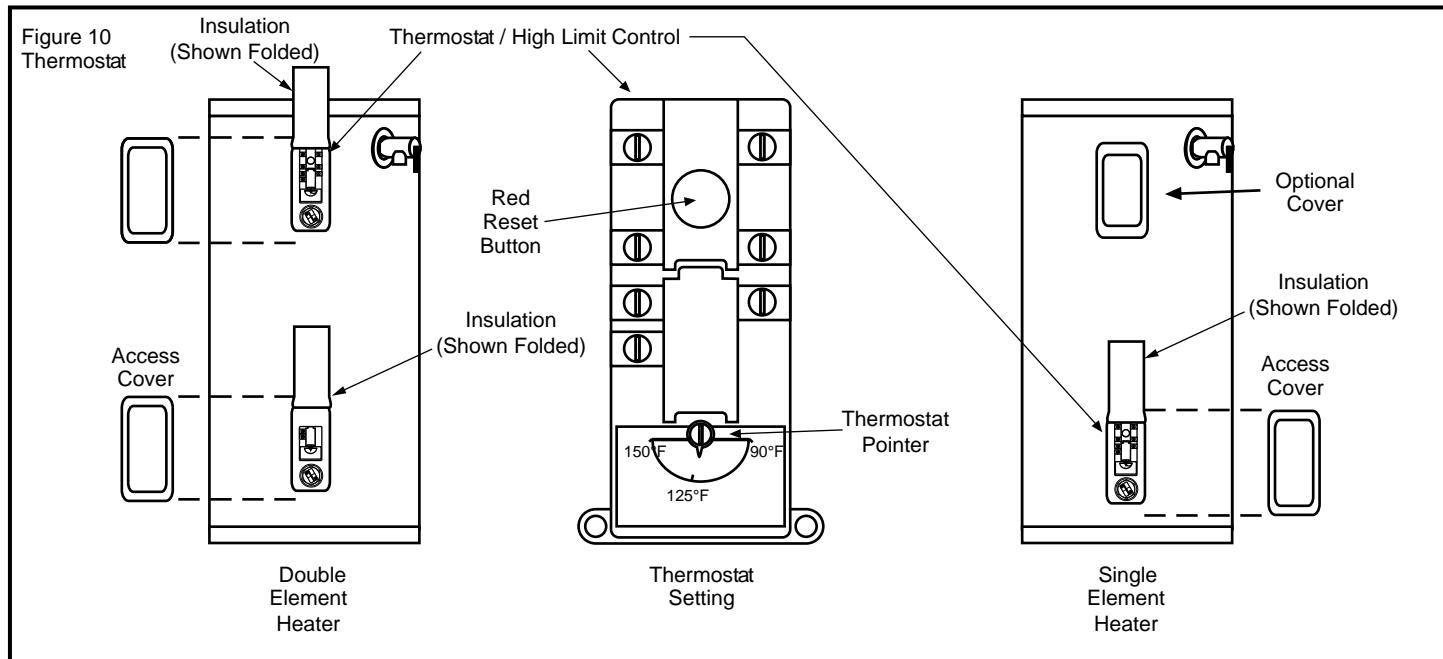
When leaving your home for extended periods (vacations, etc.) turn the thermostat to its lowest setting. This will maintain the water at low temperatures with minimum energy losses and prevent the tank from freezing during cold weather.

# Adjusting the Thermostat/High Limit Control

This water heater is equipped with one or more adjustable temperature regulating thermostats and a manual reset high limit control. The following procedures must be performed when changing the temperature of the stored water or resetting the high limit control. Upper and lower thermostats must be adjusted to the same temperature.

**IMPORTANT:** Before attempting to adjust the thermostat, make sure you read the section of "Water Temperature Regulation" section. If the instructions are not clear, contact a qualified person.

1. Disconnect the electric power.
2. Remove the access cover(s) and fold up the insulation from the thermostat(s). Do not remove the plastic cover.
3. Using a screwdriver to adjust the thermostat pointer, set the thermostat(s) to the desired water temperature.  
Be sure the RED reset button (High Limit Control) is pushed in. If needed, push in firmly to reset.
4. Fold the insulation down, making sure the thermostat(s) are well covered. Replace the access cover(s).
5. Reconnect power.



# Operational Conditions

## Anode Rod/Water Odor

Each water heater contains at least one anode rod, which will slowly deplete while protecting the glass-lined tank from corrosion and prolonging the life of the water heater. Once the anode is depleted, the tank will start to corrode, eventually developing a leak. Certain water conditions will cause a reaction between this rod and the water. The most common complaint associated with the anode rod is a "rotten egg smell" produced from the presence of hydrogen sulfide gas dissolved in the water.

**IMPORTANT:** Do not remove this rod permanently as it will void any warranties. The parts list includes a special anode that can be ordered if water odor or discoloration occurs.

**NOTE:** This rod may reduce but not eliminate water odor problems. The water supply system may require special filtration equipment from a water conditioning company to successfully eliminate all water odor problems.

Artificially softened water is exceedingly corrosive because the process substitutes sodium ions for magnesium and calcium ions. The use of a water softener may decrease the life of the water heater tank.

The anode rod should be inspected after a maximum of three years and annually thereafter until the condition of the anode rod dictates its replacement. **NOTE:** Artificially softened water requires the anode rod to be inspected annually.

The following are typical (but not all) signs of a depleted anode rod:

- The majority of the rods diameter is less than 3/8".
- Significant sections of the support wire (approx. 1/3 or more of the anode rod's length) are visible.

If the anode rod shows signs of either or both, it should be replaced.

**NOTE:** Whether reinstalling or replacing the anode rod, check for any leaks and immediately correct if found. In replacing the anode:

1. Turn off power to the water heater.
2. Shut off the water supply and open a nearby hot water faucet to depressurize the water tank.
3. Drain approximately 5 gallons of water from tank (Refer to the "Draining and Flushing" section for proper procedures). Close drain valve.
4. Remove old anode rod.
5. Use Teflon® tape or approved pipe sealant on threads and install new anode rod.
6. Turn on water supply and open nearby hot water faucet to purge air from water system. Check for any leaks and immediately correct any if found.
7. Restart the water heater as directed under the "Operating Your Water Heater" section. See the "Repair Parts Illustration" section for anode rod location.

<sup>®</sup>TEFLON is a registered trademark of E.I. Du Pont De Nemours and Company.

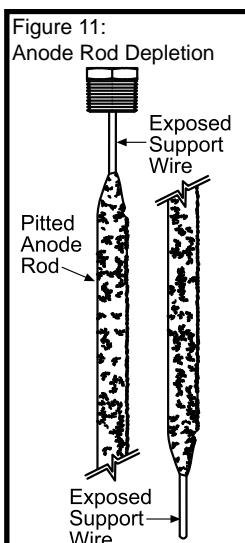
## Water Heater Sounds

During the normal operation of the water heater, sounds or noises may be heard. These noises are common and may result from the following:

1. Normal expansion and contraction of metal parts during periods of heat-up and cool-down.
2. Sediment buildup in the tank bottom will create varying amounts of noise and may cause premature tank failure. Drain and flush the tank as directed under the "Draining and Flushing" section.

## Stacking

Stacking occurs when a series of short draws of hot water (3 gallons or less) are taken from the water heater tank. This causes increased cycling of the heater elements and can result in increased water temperatures at the hot water outlet. An anti-scald device is recommended in the hot water supply line to reduce the risk of scald injury.



# MAINTENANCE OF YOUR WATER HEATER

## Temperature and Pressure Relief Valve

### ! WARNING



#### Explosion Hazard

If the temperature and pressure relief valve is dripping or leaking, have a qualified person replace it.

Examples of a qualified person include: licensed plumbers, authorized gas company personnel, and authorized service personnel.

**Do not plug valve.**

**Do not remove valve.**

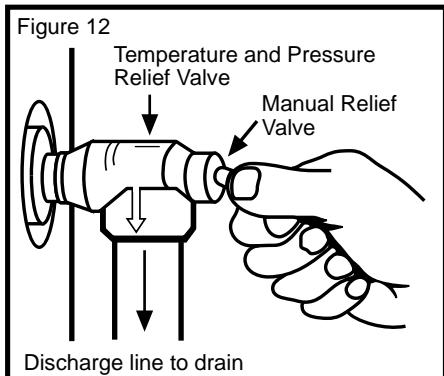
**Failure to follow these instructions can result in death or explosion.**

Manually operate the temperature and pressure relief valve at least once a year to make sure it is working properly.

To prevent water damage, the valve must be properly connected to a discharge line which terminates at an adequate drain.

Standing clear of the outlet (discharged water may be hot), slowly lift and release the lever handle on the

temperature and pressure relief valve to allow the valve to operate freely and return to its closed position. If the valve fails to completely reset and continues to release water, immediately disconnect the electrical power, close the cold water inlet valve and call a qualified person.



being shut down during freezing temperatures. To drain the tank, perform the following steps:

1. Disconnect the electrical power to the water heater.
2. Open a nearby hot water faucet until the water is no longer hot.
3. Close the cold water inlet valve.
4. Connect a hose to the drain valve and terminate it to an adequate drain or external to the building.
5. Open the water heater drain valve and allow all of the water to drain from the tank. Flush the tank with water as needed to remove sediment.
6. Close the drain valve, refill the tank, and restart the water heater as directed in this manual.

**CAUTION:** Do not turn on power to the water heater unless it is completely filled with water. To ensure that the tank is full, open a hot water faucet and allow the water to run until the air is purged and the water flows uninterrupted from the faucet.

If the water heater is going to be shut down for an extended period, the drain valve should be left open.

## Heating Element Replacement

### ! WARNING



#### Electric Shock Hazard

**Disconnect power before servicing.**

**Replace all parts and panels before operating.**

**Failure to do so can result in death or electrical shock.**

Replacement heating elements must be of the same style and voltage/wattage rating as the ones presently in the water heater. This information can be found on the flange or terminal block of the element or on the water heater data plate.

1. Disconnect the electrical power to the water heater.
2. Drain the water heater as directed in the "Draining and Flushing" section.
3. Remove the access cover(s). Fold up the insulation from the heater element(s). Remove the plastic thermostat cover from the thermostat(s) making sure to disengage the attachment point from the thermostat.
4. Disconnect the electrical wires from the heating element(s) by loosening the screws (Figure 13). Remove the screw-in element(s) by turning the element(s) counterclockwise with a 1-1/2 inch socket wrench. Remove the existing gasket(s).

## Draining and Flushing

It is recommended that the tank be drained and flushed every 6 months to remove sediment which may build up during operation. The water heater should be drained if

Figure 13

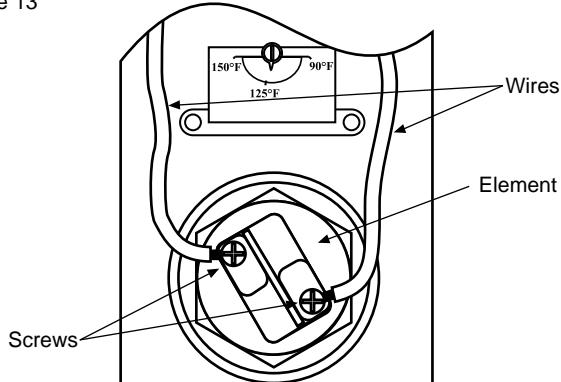
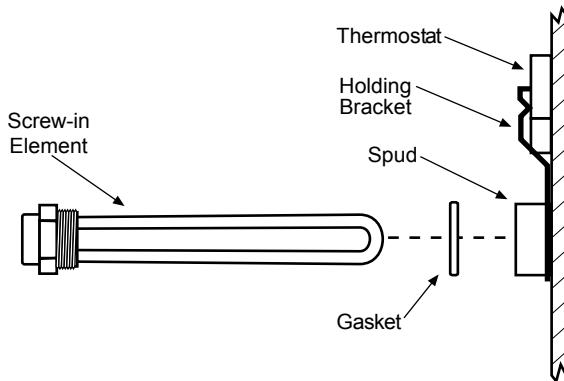


Figure 14



5. Clean the area where the gasket(s) fits to the tank. If you are replacing the bottom element, remove the accumulated sediment on the bottom of the tank.
6. Make sure the replacement element(s) has the correct voltage and wattage rating by matching it to the rating plate on the water heater. Position the new gasket(s) on the element and insert it into the water heater tank (Figure 14). Tighten the element by turning it clockwise until secure.
7. Close the drain valve. Open the nearest hot water faucet and allow the tank to fill completely with water.

- To purge the lines of any excess air and sediment, keep the hot water faucet open for 3 minutes after a constant flow of water is obtained.
8. Check for leaks around the element(s).
  9. Reconnect the electrical wires to the element and securely tighten the screws. Replace the plastic thermostat cover making sure the attachment points are engaged on the thermostat.
  10. Replace the access cover(s).
  11. Make certain the tank is filled with water. Applying electric current to heater elements not submerged in water will destroy them.
  12. Reconnect electrical power to the water heater.

## TROUBLESHOOTING CHART

PROBLEM	POSSIBLE CAUSE(S)	CORRECTIVE ACTION
<b>NO HOT WATER</b>	<ol style="list-style-type: none"> <li>1. No power to heater</li> <li>2. High Temperature Limit Switch open</li> <li>3. Non-Functioning upper thermostat or element.</li> </ol>	<ol style="list-style-type: none"> <li>1. Turn on electrical switch. Check for blown fuses or tripped breaker</li> <li>2. Reset. Check for source of trouble and correct</li> <li>3. Replace thermostat or element.</li> </ol>
<b>INSUFFICIENT HOT WATER</b>	<ol style="list-style-type: none"> <li>1. Non-Functioning thermostats</li> <li>2. Non-Functioning lower element</li> <li>3. Improper calibration</li> <li>4. Thermostats set too low</li> <li>5. Sediment or lime in tank</li> <li>6. Heater too small for job</li> <li>7. Wrong piping connections</li> <li>8. Leaking faucets</li> <li>9. Wasted hot water</li> <li>10. Long runs of exposed pipe</li> <li>11. Hot water piping on outside wall</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace thermostats</li> <li>2. Replace element</li> <li>3. Replace thermostats</li> <li>4. Set thermostats to desired temperature</li> <li>5. Drain. Determine if water treatment is needed</li> <li>6. Install adequate water heater</li> <li>7. Correct piping</li> <li>8. Repair faucets</li> <li>9. Advise customer</li> <li>10. Insulate piping</li> <li>11. Insulate piping</li> </ol>
<b>HIGH OPERATION COSTS</b>	<ol style="list-style-type: none"> <li>1. Improper Calibration</li> <li>2. Thermostats set too high</li> <li>3. Sediment or lime in tank</li> <li>4. Heater too small for job</li> <li>5. Wrong piping connections</li> <li>6. Leaking faucets</li> <li>7. Wasted hot water</li> <li>8. Long runs of exposed piping</li> <li>9. Hot water piping in exposed wall</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace thermostats</li> <li>2. Set thermostat to desired setting</li> <li>3. Drain. Flush-Provide water treatment if needed</li> <li>4. Install adequate heater</li> <li>5. Correct piping</li> <li>6. Repair faucets</li> <li>7. Advise customer</li> <li>8. Insulate piping</li> <li>9. Insulate piping</li> </ol>
<b>SLOW HOT WATER RECOVERY</b>	<ol style="list-style-type: none"> <li>1. Non-Functioning upper element</li> <li>2. Non-Functioning lower element</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace element</li> <li>2. Replace element</li> </ol>
<b>DRIP FROM RELIEF VALVE</b>	<ol style="list-style-type: none"> <li>1. Excessive water pressure</li> <li>2. Closed system</li> </ol>	<ol style="list-style-type: none"> <li>1. Use Pressure Reducing Valve and Pressure Relief Valve</li> <li>2. See "Closed System/Thermal Expansion" section</li> </ol>
<b>THERMOSTAT DOES NOT SHUT OFF</b>	<ol style="list-style-type: none"> <li>1. Non-Functioning thermostats</li> <li>2. Improper calibration</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace thermostats</li> <li>2. Replace thermostats</li> </ol>
<b>WATER ODOR</b>	<ol style="list-style-type: none"> <li>1. Sulfides in the water</li> </ol>	<ol style="list-style-type: none"> <li>1. See "Anode Rod/Water Odor" section</li> </ol>

# REPAIR PART ILLUSTRATION

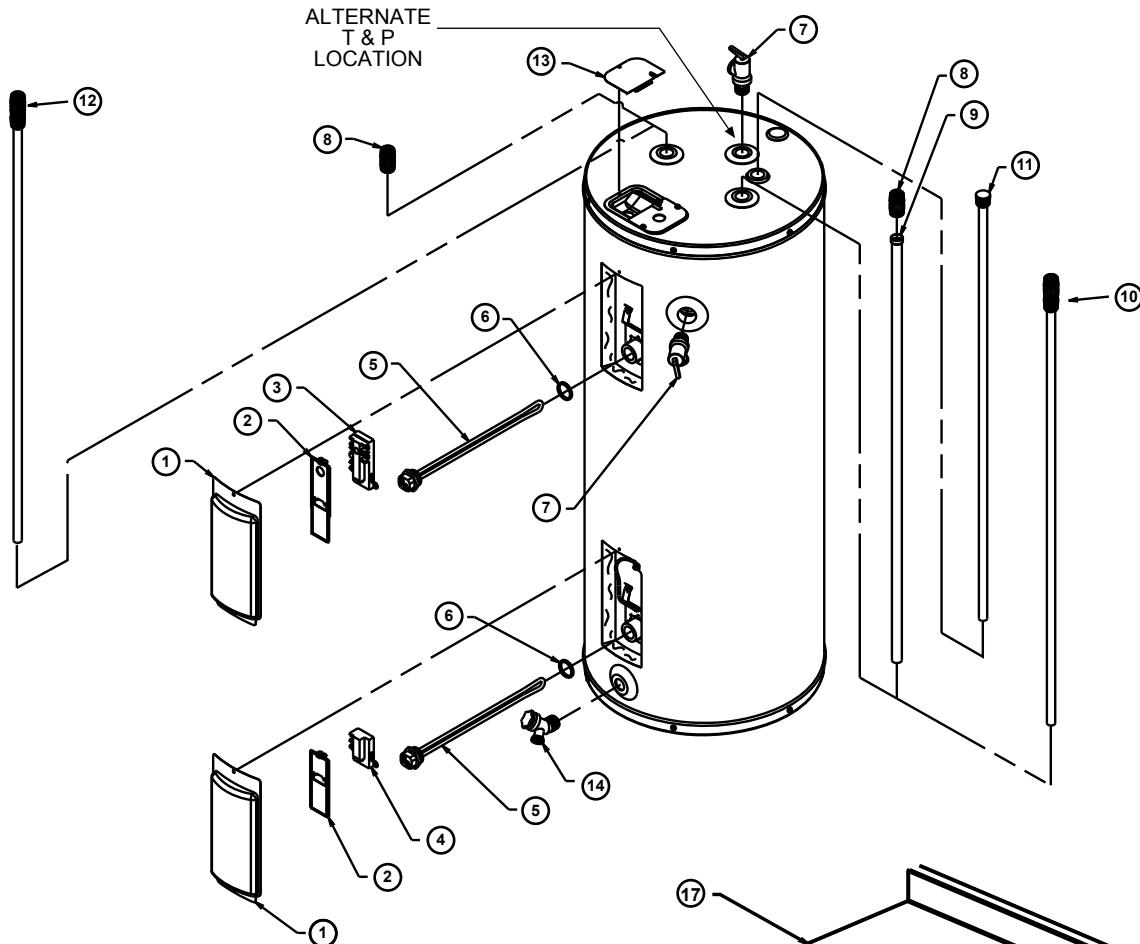
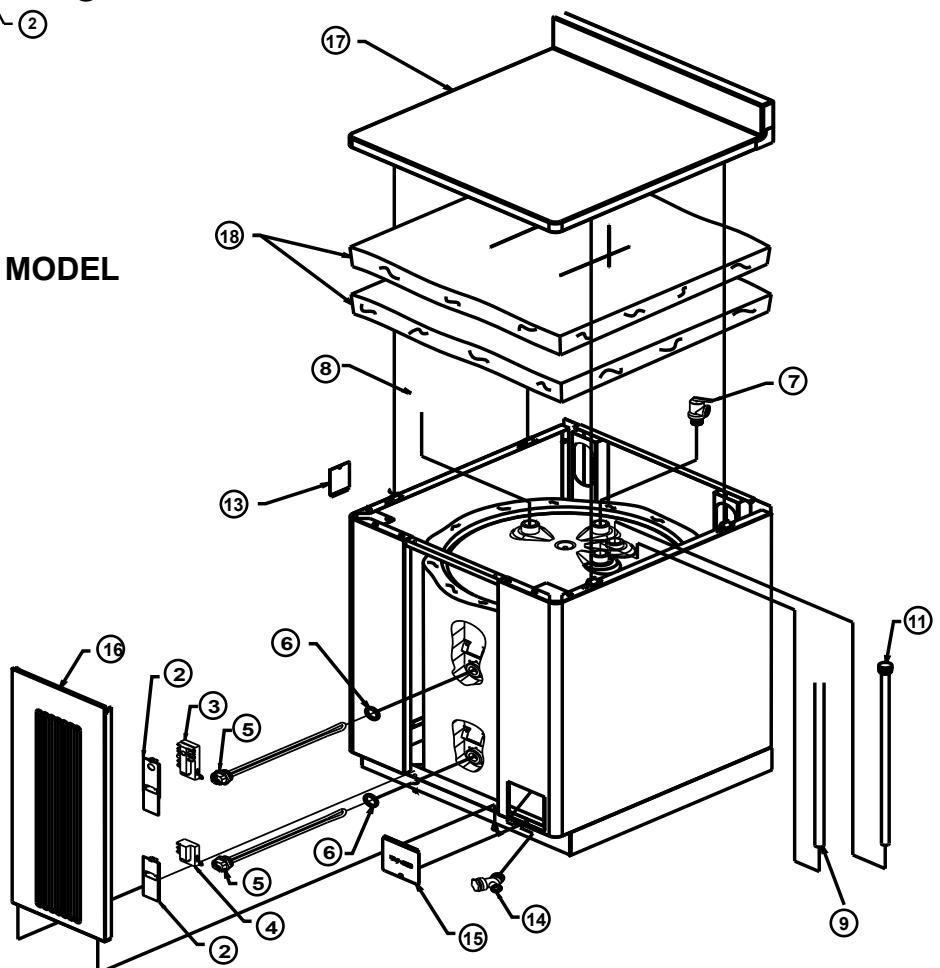
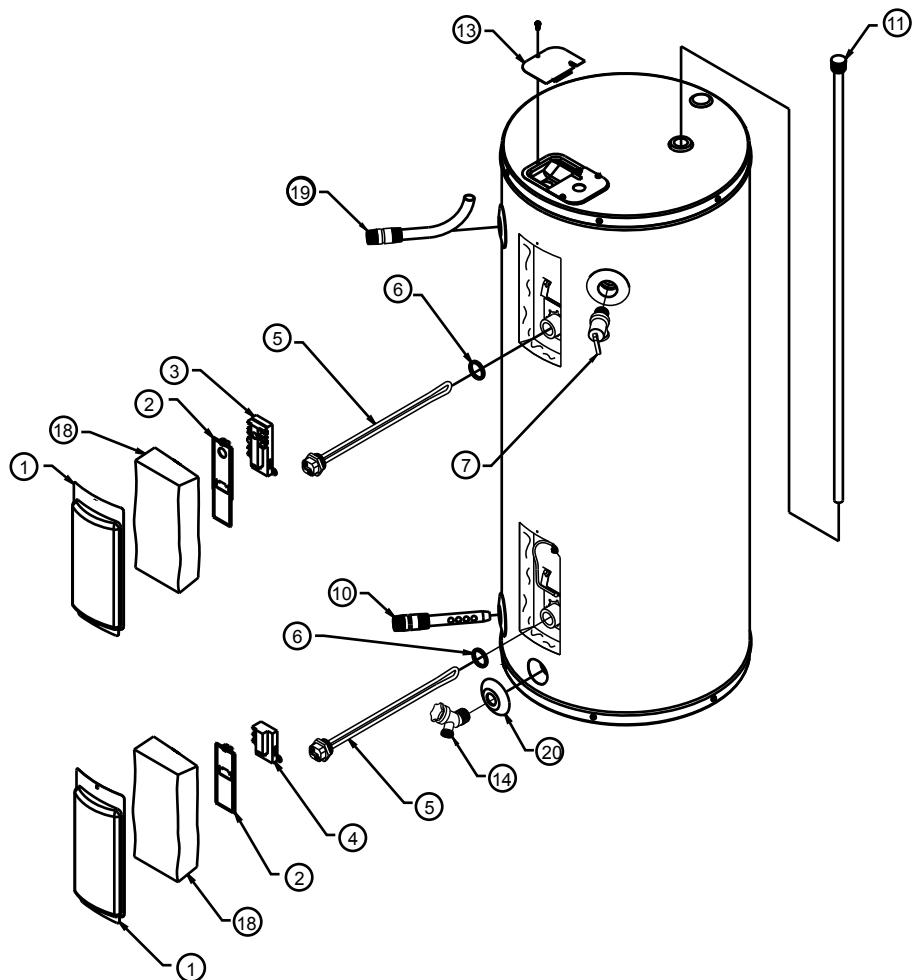


TABLE TOP MODEL



## SIDE WATER CONNECTIONS



### REPAIR PARTS

Repair parts may be ordered through your plumber, local distributor, home improvement center, or by calling 1-800-999-9515. When ordering repair parts always give the following information:

1. Model, serial and product number
2. Item number
3. Parts description

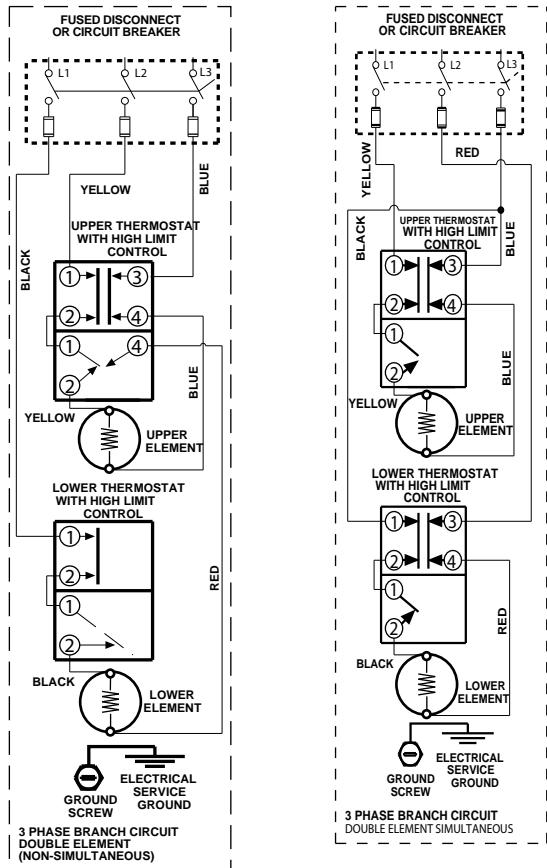
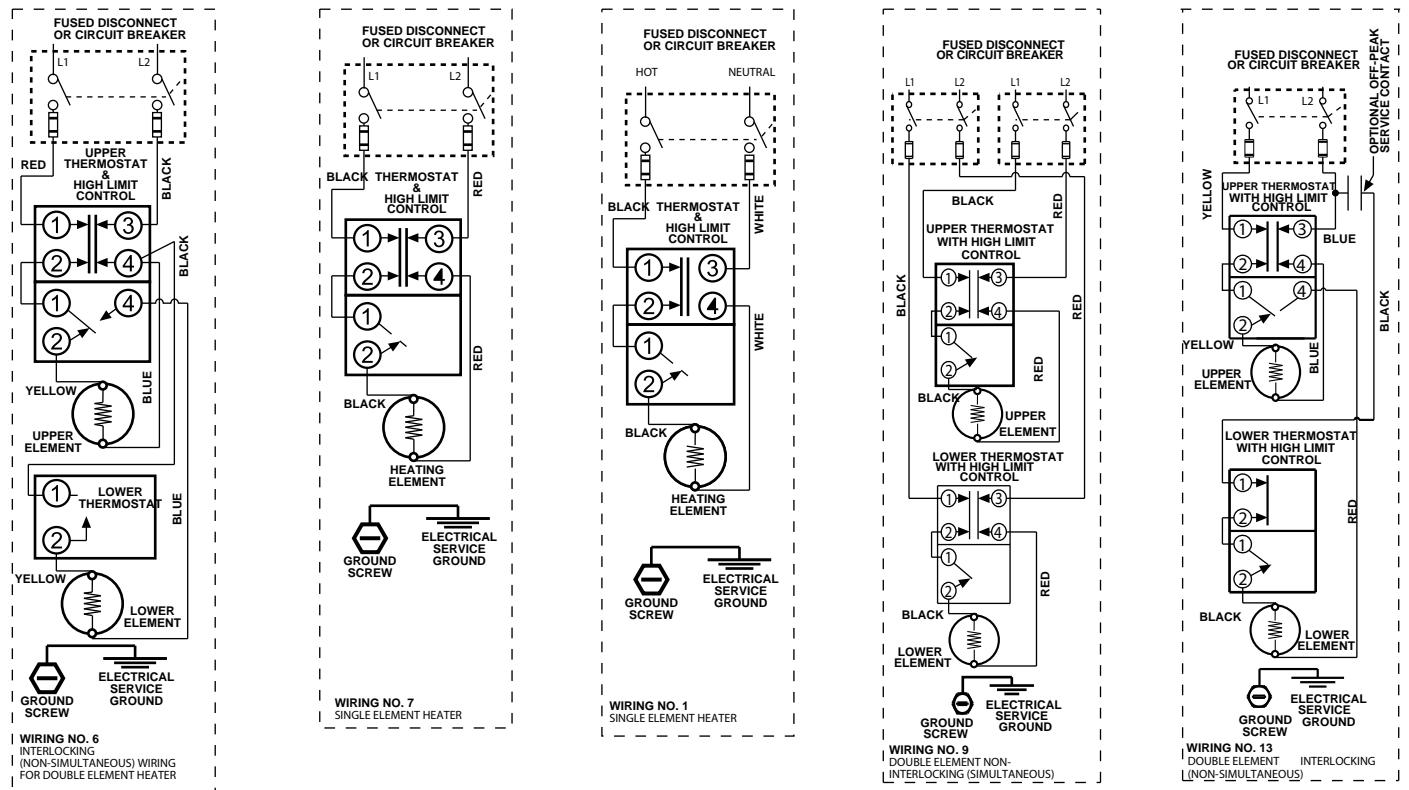
### LEGEND

- ◆ Special anode rod (See "Anode Rod/Water Odor" section)
- Temperature and Pressure Relief Valve is required, but may not be factory installed.
- ▲ Specify thermostat type when ordering
- Exclusive to the Table Top Water Heaters.

### REPAIR PARTS LIST

ITEM NO.	PARTS DESCRIPTION
1	ACCESS DOORS
2	THERMOSTAT COVERS (UPPER & LOWER)
3	UPPER THERMOSTAT ▲
4	LOWER THERMOSTAT ▲
5	ELEMENT
6	ELEMENT GASKET
7	TEMPERATURE AND PRESSURE RELIEF VALVES ■
8	HEAT TRAPS
9	DIP TUBE
10	HEAT TRAP/DIP TUBE COMBINATION
11	ANODE ROD ◆
12	HEAT TRAP/ANODE ROD COMBINATION ◆
13	JUNCTION BOX COVER
14	DRAIN VALVE
15	DRAIN ACCESS PANEL ●
16	FRONT PANEL ●
17	TOP PANEL ●
18	INSULATION
19	NIPPLE/J-TUBE COMBINATION
20	FLANGE

# THERMOSTAT WIRING DIAGRAM



## BRANCH CIRCUIT SIZING GUIDE

Based on N.E.C. NFPA NO. 70 - 1999

WATT LOAD	Recommended Over Current Protection Rating (Amperage)			Copper Wire Size AWG Based on N.E.C. Table 310-16(60°C)		
	120 V	208 V	240 V	120 V	208 V	240 V
1500*	15	15	15	12	14	14
2000	20	15	15	10	14	14
2500	30	15	15	10	14	14
3000	30	20	15	8	12	12
3500	-	20	20	-	10	12
4000	-	25	20	-	10	10
4500	-	30	25	-	10	10
5000	-	30	30	-	10	10
5500	-	35	30	-	8	10
6000	-	35	30	-	8	8
9000	-	50	45	-	6	6
12000	-	70	60	-	3	4

\* Wattages less than 1500 may be wired 14 gage with 15 amp protection