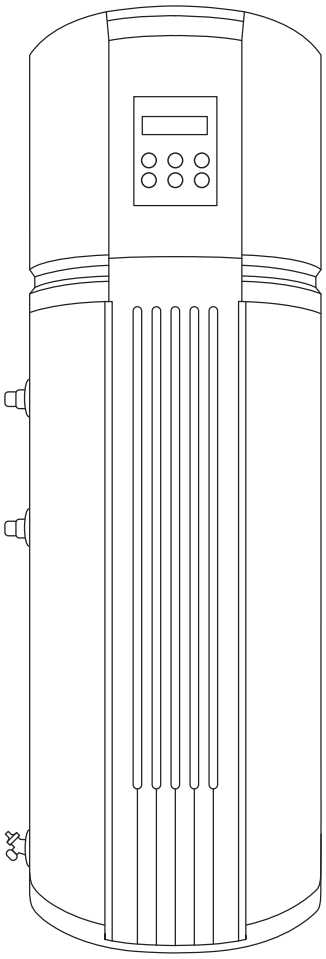
Hybrid Electric Residential Heat Pump Water Heaters

Use and Care Manual



Installation

Start-Up

Maintenance

Parts

Warranty

LEAD FREE
Safe Drinking Water Act
SDWA • Section 1417

c UL us
LISTED

AHRI CERTIFIED™
www.ahridirectory.org

⚠ WARNING
This manual must only be used by a qualified installer / service technician. Read all instructions in this manual before installing. Perform steps in the given order. Failure to do so could result in substantial property damage, severe personal injury, or death.
California Proposition 65 Warning: This product contains chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.
NOTICE
The manufacturer reserves the right to make product changes or updates without notice and will not be held liable for typographical errors in literature.
The surfaces of these products contacted by potable (consumable) water contain less than 0.25% lead by weight as required by the Safe Drinking Water Act, Section 1417.
NOTE TO CONSUMER: PLEASE KEEP ALL INSTRUCTIONS FOR FUTURE REFERENCE.

lp-628 Rev. 000 Rel. 000 Date 8.11.17

SPECIAL ATTENTION BOXES

The following defined terms are used throughout this manual to bring attention to the presence of hazards of various risk levels or to important product information.

⚠ DANGER

DANGER indicates an imminently hazardous situation which, if not avoided, will result in serious personal injury or death.

⚠ WARNING

WARNING indicates a potentially hazardous situation which, if not avoided, could result in personal injury or death.

⚠ CAUTION

CAUTION indicates a potentially hazardous situation which, if not avoided, may result in moderate or minor personal injury.

CAUTION

CAUTION used without the safety alert symbol indicates a potentially hazardous situation which, if not avoided, may result in property damage.

NOTICE

NOTICE is used to address practices not related to personal injury.

Foreword

This manual is intended to be used in conjunction with other literature provided with the water heater. This includes all related control information. It is important that this manual, all other documents included in this system, and additional publications including the *Code for the Installation of Heat Producing Appliances* (latest version), be reviewed in their entirety before beginning any work.

Installation should be made in accordance with the regulations of the Authority Having Jurisdiction, local code authorities, and utility companies which pertain to this type of water heating equipment.

Authority Having Jurisdiction (AHJ) – The AHJ may be a federal, state, local government, or individual such as a fire chief, fire marshal, chief of a fire prevention bureau, labor department or health department, building official or electrical inspector, or others having statutory authority. In some circumstances, the property owner or his/her agent assumes the role, and at government installations, the commanding officer or departmental official may be the AHJ.

NOTE: The manufacturer reserves the right to modify product technical specifications and components without prior notice.

For the Installer

This water heater must be installed by qualified and licensed personnel. The installer should be guided by the instructions furnished with the water heater, and by local codes and utility company requirements.

Installations Must Comply With:

Local, state, provincial, and national codes, laws, regulations, and ordinances.

The latest version of the *National Electrical Code, NFPA No. 70*.

In Canada - *Canadian Electrical Code, CSA 22.1*.

For Your Records

Write the Product Model and Serial Numbers:

Model # _____

Serial # _____

These numbers are listed on the product ratings label.
Keep this manual and information for future reference.

⚠ WARNING

IMPORTANT SAFETY INSTRUCTIONS

When using electrical appliances, basic safety precautions to reduce the risk of fire, electric shock, or injury to persons should be followed, including:

1. READ ALL INSTRUCTIONS BEFORE USING THIS WATER HEATER.

2. This water heater must be properly grounded before use. Connect only to a properly grounded outlet. See Part 4 – Wiring, this manual, for grounding details.

3. Install or locate this water heater only in accordance with the provided installation instructions.

4. Use this water heater only for its intended use as described in this manual.

5. Do not operate this water heater if it has been damaged or dropped.

8. This water heater should be serviced only by qualified service personnel. Contact the water heater installer or a qualified service agency for examination, repair, or adjustment.

SAVE THESE INSTRUCTIONS

Table of Contents

Part 1 - General Safety Information

This water heater is approved for indoor installations only and is not intended for use as a pool heater. Clearance to combustible materials: 0" top, bottom, sides, and back. Heater must have room for service: 7" front and back, 16" top, and 12" sides are minimum recommended service clearances. If you cannot provide these clearances, it may not be possible to service the water heater without removing it from its installation location.

This water heater needs at least 700 cubic feet of unconditioned indoor ambient air to operate properly. Do not install this water heater in a closet or confined space. Ensure the water heater is installed on a floor that can support its full filled weight (660 lbs). This water heater has been approved for installation on combustible flooring. Do not install directly on carpeting. Install the water heater in a location where temperature and pressure relief valve discharge or a leak will not result in damage to the surrounding area. If such a location is not available, install an auxiliary catch pan.

⚠ WARNING

Installer - Read all instructions in this manual before installing. Perform steps in the given order.

User - This manual is for use only by a qualified heating installer / service technician. Have this water heater serviced / inspected annually by a qualified service technician.

FAILURE TO ADHERE TO THE GUIDELINES ON THIS PAGE CAN RESULT IN SUBSTANTIAL PROPERTY DAMAGE, SEVERE PERSONAL INJURY, OR DEATH.

NOTE: If the water heater is exposed to the following, do not operate. Immediately call a qualified service technician.

1. Fire
2. Damage
3. Water

Failure to follow this information could result in property damage, severe personal injury, or death.

DO NOT USE THIS WATER HEATER IF ANY PART HAS BEEN SUBMERGED IN WATER. Immediately call a qualified service technician. The water heater MUST BE replaced if it has been submerged. Operating a previously submerged water heater could result in property damage, severe personal injury, or death.
NOTE: Water heater damage due to flood or submersion is considered an Act of God, and IS NOT covered under product warranty.

NOTE: Obey all local codes. Obtain all applicable permits before installing the water heater.

NOTE: Install all system components and piping in such a manner that does not reduce the performance of any fire rated assembly.

CAUTION

Do not use this water heater for anything other than its intended purpose (as described in this manual). Doing so could result in property damage and WILL VOID product warranty.

High heat sources (sources generating heat 100°F / 37°C or greater, such as stove pipes, space heaters, etc.) may damage plastic components of the water heater as well as plastic vent pipe materials. Such damages ARE NOT covered by warranty. It is recommended to keep a minimum clearance of 8" from high heat sources. Observe heat source manufacturer instructions, as well as local, state, provincial, and national codes, laws, regulations and ordinances when installing this water heater and related components near high heat sources.

NOTICE

UNCRATING THE WATER HEATER - Any claims for damage or shortage in shipment must be filed immediately against the transportation company by the consignee.

A. When Servicing the Water Heating System

⚠ WARNING

Be sure to disconnect electrical power before performing service. Failure to do so could result in electrical shock, property damage, serious personal injury, or death.

NOTE: When inquiring about service or troubleshooting, reference the model and serial numbers from the water heater rating label.

To avoid severe burns, allow water heater and associated equipment to cool before servicing.

B. Heater Water

Do not use petroleum-based cleaning or sealing compounds in a water heating system. Gaskets and seals in the system may be damaged. This can result in substantial property damage.

Do not use "homemade cures" or "patent medicines". Damage to the water heater, substantial property damage, and/or serious personal injury may result.

C. Freeze Protection

NOTE: Consider piping and installation when determining heater location. Failure of the water heater due to freeze related damage IS NOT covered by product warranty.

⚠ WARNING

NEVER use any toxic chemical, including automotive, standard glycol antifreeze, or ethylene glycol made for hydronic (non-potable) systems. These chemicals can attack gaskets and seals in water systems, are poisonous if consumed, and can cause personal injury or death.

D. Water Temperature Adjustment

Safety and water conservation are factors to be considered when selecting the water temperature setting. Water temperatures above 125°F can cause severe burns or death from scalding. If the water heater is going to have a set temperature above 120°F, it is recommended to use an ASSE 1017 rated mixing valve to avoid severe burns or death from scalding temperatures.

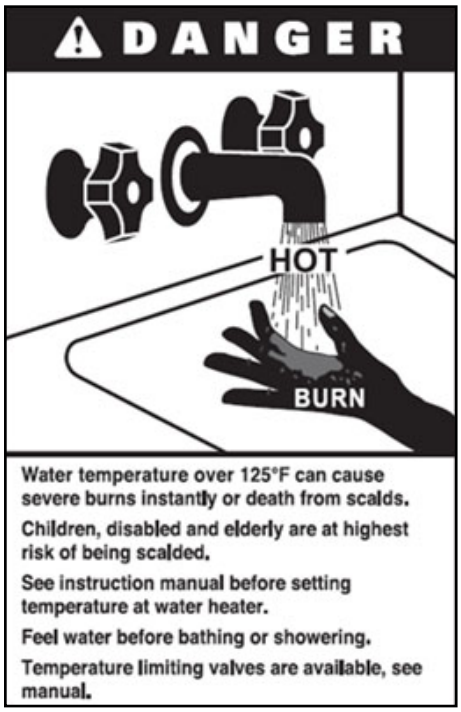
Mixing valves for reducing point-of-use water temperature by mixing hot and cold water in branch water lines are available. Contact a licensed plumber or the local plumbing authority for further information.

⚠ WARNING

Households with small children, disabled, or elderly persons may require a 120°F or lower temperature setting to prevent severe personal injury or death due to scalding.

Approximate Time / Temperature Relationships in Scalds	
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 1 - Approximate Time / Temperature Relationships in Scalds



E. Combustible Materials

WARNING

Gasoline, as well as other flammable materials and liquids (adhesives, solvents, etc.), and the vapors these items produce are extremely dangerous. DO NOT handle, use, or store gasoline or other flammable or combustible materials anywhere near or in the vicinity of the water heater. The arc drawn in the water heater controls can ignite these vapors. Failure to follow these instructions can result in property damage, serious personal injury, or death.

F. Installations in the State of California

California Law requires that residential water heaters must be braced, anchored, or strapped to resist falling or horizontal displacement due to earthquake motions. For residential water heaters up to 52 gallon capacity, a brochure with generic earthquake bracing instructions can be obtained from: Office of the State Architect, 400 P Street, Sacramento, CA 95814, or you may call 916-324-5315, or ask your water heater dealer for more information.

Applicable local codes shall govern installation. For residential water heaters of a capacity greater than 52 gallons, consult the local building jurisdiction for acceptable bracing procedures.

G. Hydrogen Gas

WARNING

Hydrogen gas can be produced in a hot water system 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 reduce the risk of injury, it is recommended that the kitchen sink hot water faucet be opened for several minutes before using any electrical water heater connected to the hot water system. If hydrogen is present, there will be an unusual sound, such as air escaping through the pipe as water begins to flow. Do not smoke or use an open flame near the faucet while it is open. Failure to follow this warning could result in property damage, severe personal injury, or death.

H. Safety Considerations

1. Turn off power to the water heater if it has been subjected to overheating, fire, flood, or physical damage.
2. **Do Not** turn on water heater unless it is filled with water.
3. **Do Not** turn on water heater if cold water supply shut-off valve is closed.
4. **Do Not** store or use gasoline or other flammable vapors or liquids, such as adhesives or paint thinner, in the vicinity of this or any other water heater. Open doors and windows for ventilation if such flammables must be stored near the water heater.

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

5. If there is any difficulty in understanding or following the Control Instructions or the Maintenance and Cleaning Sections, it is recommended that a qualified person or serviceman perform the work.

I. Refrigerant Safety

Heat pump components must only be serviced by qualified personnel. Recover appliance refrigerant charge using correct recovery procedures. Refrigerant must be disposed of at an authorized reclamation facility.

WARNING

Refrigerant is under high pressure. Avoid getting refrigerant in the eyes or on the skin. Smell cautiously, as refrigerant gas could be toxic and highly acrid. This appliance must only be serviced by qualified personnel. Improper service methods may result in property damage, severe personal injury, or death.

NOTICE

Important information to know about disposal of refrigerants: Dispose of appliance in accordance with Federal and Local regulations. Refrigerants must be evacuated bya licensed, EPA certified refrigerant technician in accordance with established procedures.

J. Safety Controls

The water heater is equipped with two temperature-limiting controls (TCO and TOD) that are located above the heating element in contact with the tank surface. If for any reason the water temperature becomes excessively high, the temperature-limiting control (TCO or TOD) breaks the electrical circuit to the heating element. Once the control opens, it must be reset manually. Resetting the temperature limiting controls should only be done by a qualified service technician.

WARNING

The cause of the high temperature condition must be investigated by a qualified service technician and corrective action must be taken before placing the water heater in service again. Failure to follow this warning could result in property damage, severe personal injury, or death.

To reset the temperature-limiting control:

1. Turn off the power to the water heater.
2. Remove the jacket access panel(s) and insulation. DO NOT remove the thermostat protective cover.
3. Press the red RESET button.
4. Replace the insulation and jacket access panel(s) before turning on power to the water heater.

WARNING

This water heater must be properly grounded before use. Failure to follow this warning could result in property damage, severe personal injury, or death.

K. Water Chemistry Requirements

CAUTION

Chemical imbalance of the water supply may affect efficiency and cause severe damage to the appliance and associated equipment. Water quality must be professionally analyzed to determine whether it is necessary to treat the water. Various solutions are available to adjust water quality. Adverse water quality will affect the reliability of the system. In addition, operating temperatures above 135°F will accelerate the build-up of lime scale and possibly shorten appliance service life. Failure of an appliance due to lime scale build-up, low pH, or other chemical imbalance IS NOT covered by the warranty.

The water must be potable, free of corrosive chemicals, sand, dirt, and other contaminates. It is up to the installer to ensure the water does not contain corrosive chemicals or elements that can damage the heat exchanger. Potable water is defined as drinkable water supplied from utility or well water in compliance with EPA secondary maximum contaminant levels (40 CFR Part 143.3). If the water contains contaminants higher than outlined by the EPA, water treatment is recommended and additional, more frequent maintenance may be required.

If you suspect that your water is contaminated in any way, discontinue use of the appliance and contact an authorized technician or licensed professional.

- **Water pH between 6.5 and 8.5**
  - pH levels below 6.5 can cause an increase in the rate of corrosion. pH of 8.5 or higher can potentially cause lime scale build-up
  - Maintain water pH between 6.5 and 8.5. Check with litmus paper or have it chemically analyzed by a local water treatment company.
  - If the pH is not between 6.5 and 8.5, consult a local water treatment company for solutions.
- **Hardness less than 12 grains (200 mg/L) (Residential Use - water temperatures below 140°F)**
- **Hardness less than 7 grains (120 mg/L) (Commercial Use - water temperatures of 140°F and greater)**
  - Hardness levels above the required amounts can lead to lime scale build-up throughout the system. Water below 5 grains/gallon (85 mg/L) may be over softened.
  - Consult local water treatment companies for unusually hard water areas (above the required amounts) or for other treatment solutions if water is being over softened (below 5 grains/gallon [85 mg/L]).
- **Chloride concentration less than 100 ppm (mg/L)**
  - Do not fill appliance or operate with water containing chlorides in excess of 100 ppm (mg/L).
  - Using chlorinated fresh water should be acceptable as levels are typically less than 5 ppm (mg/L).
  - Do not connect the appliance to directly heat swimming pool or spa water.
- **Total Dissolved Solids (TDS) less than 500 ppm (mg/L)**
  - Total dissolved solids are minerals, salts, metals, and charged particles that are dissolved in water.
  - The greater the amounts of TDS present, the higher the corrosion potential due to increased conductivity in the water.
  - If using softened water to fill the appliance, it is still possible to have high TDS. This water can be corrosive. Consult local water treatment companies for other treatment solutions to reduce this effect.

***NOTE:** To promote appliance service life, it is strongly recommended to follow the maintenance procedures in this manual.

Part 2 - Prepare the Water Heater

Remove all sides of the shipping crate to allow the heater to be moved into its installation location.

CAUTION

COLD WEATHER HANDLING - If the water heater has been stored in a very cold location (BELOW 0°F) before installation, handle with care until the components come to room temperature. Failure to do so could result in damage to the water heater.

A. What's in the Box

Components included with the water heater:

- Three (3) Inch Plastic Condensate Drain Hose
- Six (6) Foot Plastic Condensate Drain Hose
- Use and Care Manual and Warranty
- Cool Air Output Adapter (Optional)

B. Locating the Water Heater

CAUTION

Locate the water heater where any leakage from the relief valve, related piping, tank, or connections will not result in damage to surrounding areas or lower floors of the building. The water heater should be located near a floor drain or installed in a drain pan. Leakage damages ARE NOT covered by warranty.

⚠ WARNING

This water heater is certified for indoor use only. DO NOT INSTALL OUTDOORS. Outdoor installations ARE NOT covered by warranty. Failure to install the water heater indoors could result in property damage, severe personal injury, or death.

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

Local Installation Regulations

This water heater must be installed in accordance with these instructions, local codes, utility codes, and utility company requirements, or, in the absence of local codes, the latest edition of the *National Electrical Code*. It is available from some local libraries or can be purchased from the National Fire Prevention Association, Batterymarch Park, Quincy, MA 02169 as booklet ANSI/NFPA 70.

Power Requirements

Check the markings on the rating plate of the water heater to verify the power supply corresponds to the water heater requirements (240V/30A).

Location

Locate the water heater indoors, in a clean, dry area as near as pratical to the area of greatest water heater demand. Long uninsulated water lines can waste heat, energy, and money.

NOTE: Because this unit draws in air from the room to heat water, the room must be at least 10' x 10' x 7' (700 cubic feet) or larger. If the room is smaller, there must be a louvered door to allow for free air passage into the mechanical room. The louvered panel must be at least 2' x 3' in size.

Locate the water heater in such a manner that the air filter, cover, and front panels can be removed to permit inspection and servicing, such as removal of elements or cleaning of the filter.

The water heater and water lines should be protected from freezing temperatures and highly corrosive atmospheres. Do not install the water heater in outdoor, unprotected areas.

Water Heater Type			Hybrid, Unitized		
Storage Size / Water Tank Volume		Gal (L)	50 (190)		
Power Supply		Ph-V-Hz	1-240/208-60		
Water Connections			3/4" NPT		
Ambient Temp. Operating Range		ºF (ºC)	-5 to 130 (-21 to 55)		
Physical Properties	Net Dimension (Diameter×H)	in. (mm)	22.5 × 64.5 (568 × 1640)		
	Packing Dimensions (W×H×D)		27.5 × 68.5 × 28.5 (700 × 1740 × 720)		
	Net Weight	lbs. (kg)	213 (96.5)		
	Gross Weight		243 (110.5)		
Outlet Water Temp.	Set Point Range	ºF (ºC)	100-140 (38-60)		
	Factory Setting		125 (50)		
Operating Modes			Economy	Auto	Electric
Operating Mode Ambient Temp. Range		ºF (ºC)	45 to 120 (7 to 48)		-5 to 130 (-20 to 55)
Water Heating	Heating Capacity	kW	1.5		4.5
	Max. Power Input		0.8	5.0	
	Ef	-	2.6		-
	FHR	US Gal	60	65.0	60.0
	Heat Pump COP	-	3.75		-
	Max. Current Input	A	6.5	24.0	21.0
	Resistance Elements	kW	4.5		
Branch Wiring	Minimum Circuit Ampacity	Amps	25		
	Over-Current Protection Recommendations		30		
	Copper Wire Size per NEC Table 310.16 (75 deg. C)	AWG	10		
Noise Level		dB(A)	48		
Refrigerant	Type		R134a		
	Charge Quantity	lbs. (kg)	1.8 (0.8)		
	Operating Pressure - High / Low	PSIA	331 / 86 at ambient 70ºF		
Tank Max. Operating Pressure		PSI	150		
Certification	Energy Star		Yes		
	UL				

Table 2 - Technical Specifications and Dimensions

CAUTION

The service life of the water heater's exposed metallic surfaces, such as the junction box, is directly influenced by proximity to damp and salty marine environments. In such areas higher concentration levels of chlorides from sea spray coupled with relative humidity can lead to degradation of water heater components.

⚠ WARNING

This water heater MUST NOT be installed in a space where liquids which give off flammable vapors are used or stored. Such liquids include gasoline, LP gas (butane and propane), paint or adhesives and thinners, solvents, or removers. Because of natural air movement in a room or other enclosed space, flammable vapors can be carried from where flammable liquids are being used or stored. The operation of the control system within the water heater can ignite these vapors, causing an explosion or fire which may result in property damage, as well as potentially severe burns or death to those in range.

C. Required Clearances

In the event service is needed, there must be AT LEAST 16" top, 12" sides, and 7" minimum clearance (air space) between any object and the front and rear covers.

A 16" minimum clearance is required to remove the filter for cleaning. The hot and cold water plumbing and electrical connections must not interfere with the removal of the filter.

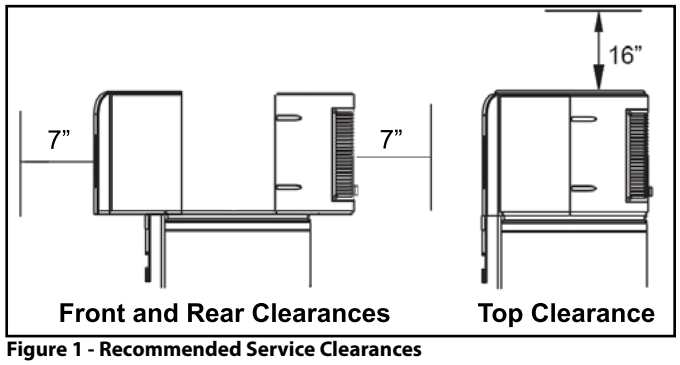
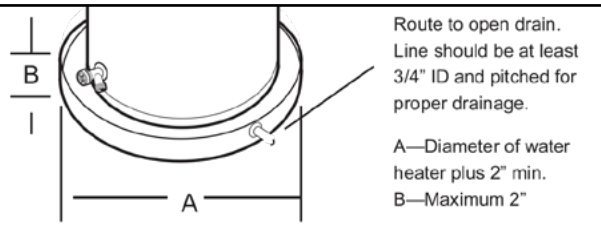


Figure 1 - Recommended Service Clearances

NOTE: If you do not provide the minimum clearances shown in Figure 1, it might not be possible to service the water heater without removing it from the space.

NOTE: To save on heating costs and improve energy efficiency keep the distance between the water heater and fixtures to a minimum to reduce heat loss from excess piping and keep friction loss at a minimum. Ensure all water heater piping is properly insulated to minimize heat loss.



NOTE: Auxiliary catch pans MUST conform to local codes. Catch pan kits are available from the store where the water heater was purchased, a plumbing supply store, or any water heater distributor.

Figure 2 - Catch Pan Details

D. Condensate Drain

The water heater has a condensate drain: therefore a drain must be available in close proximity to the unit. The drain must be no higher than 36" above the floor (laundry drain is acceptable). If no drain is available, a common condensate pump with a capacity no less than 1 gallon/day must be purchased from a local plumbing supply store and installed.

Ensure the water heater is installed level to allow condensate to drain from the evaporator. See Figure 3. The water heater should be installed no more than 2° off level to allow condensate to drain properly.

⚠ WARNING

Incorrect operating conditions can lead to damage to the heating system and put safe operation at risk. Ensure that the installation location adheres to the information included in this manual. Failure to do so could result in property damage, serious personal injury, or death. Failure of the water heater or components due to incorrect operating conditions IS NOT covered by product warranty.

This water heater must be installed upright in the vertical position as described in this manual. DO NOT attempt to install this water heater in any other orientation. Doing so will result in improper water heater operation and property damage, and could result in serious personal injury or death.

Part 3 - Installing the Water Heater

A. 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 backflow preventer, or 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 backflow 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 pressure is easily dissipated.

A closed water system prevents the expanding water from flowing back into the main supply line, and the resulting thermal expansion can create a rapid and dangerous pressure increase in the water heater and system piping. This pressure increase can quickly reach the safety limit 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 water heater itself. Replacing the relief valve will not correct this 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 the illustration in Figure 4). The expansion tank is designed with an air cushion built in that compresses as the system pressure increases, thereby relieving the thermal expansion and eliminating the repeated operation of the relief valve.

Other methods of controlling thermal expansion are available. Contact your installing contractor, water supplier, or plumbing inspector for additional information regarding this subject.

B. Water Supply Connections

Refer to Figures 4 and 5 for suggested typical installations. 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 ¾" NPT on all models.

NOTE: Install a shut-off valve in the cold water line near the water heater. This will enable easier service and maintenance of 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 the adapter to the cold water connections on the water heater. Any heat applied to the hot or cold water connections will permanently damage the dip tubes.

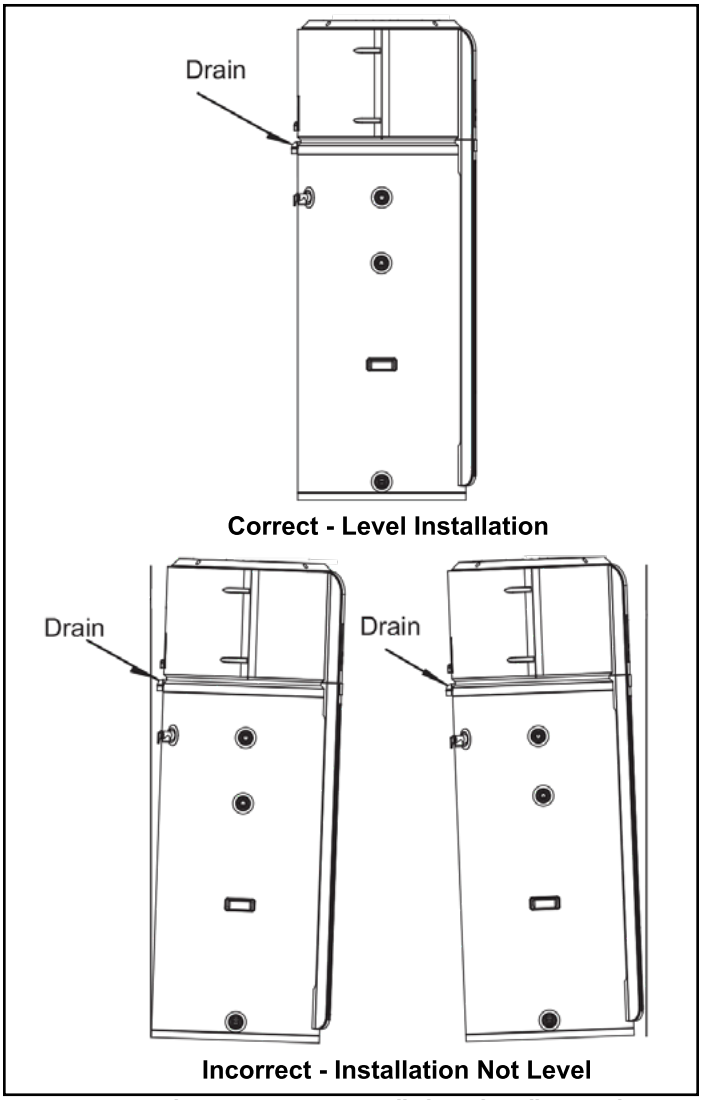


Figure 3 - Ensure the Water Heater is Installed Level to Allow Condensate to Drain from the Evaporator

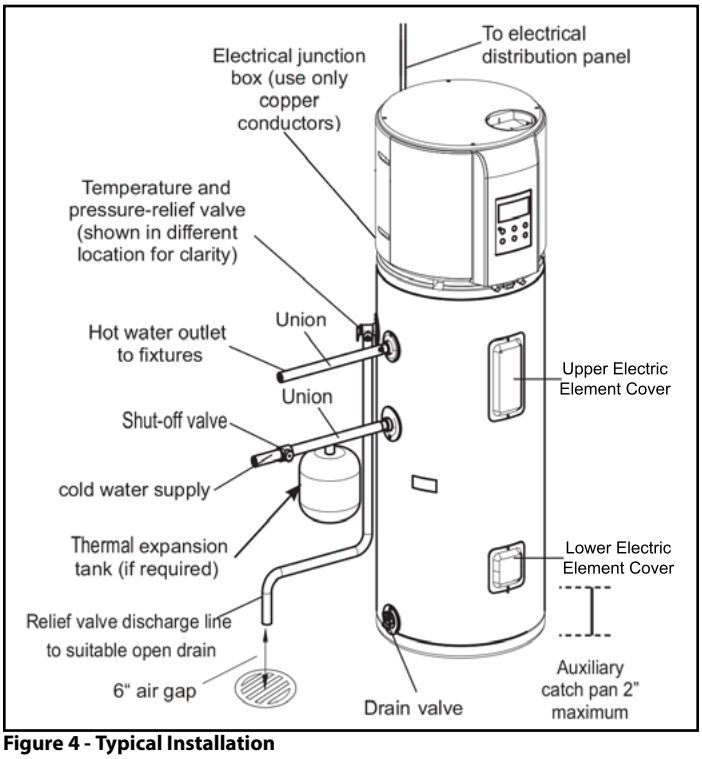


Figure 4 - Typical Installation

C. Relief Valve

A new combination temperature and pressure relief valve, complying with the Standard for Relief Valves and Automatic Gas Shut-Off Devices for Hot Water Supply Systems, ANSI Z21.22, is supplied and must remain installed in the opening provided and marked for the purpose on the water heater. No valve of any type should be installed between the relief valve and the tank. Local codes shall govern the installation of relief valves.

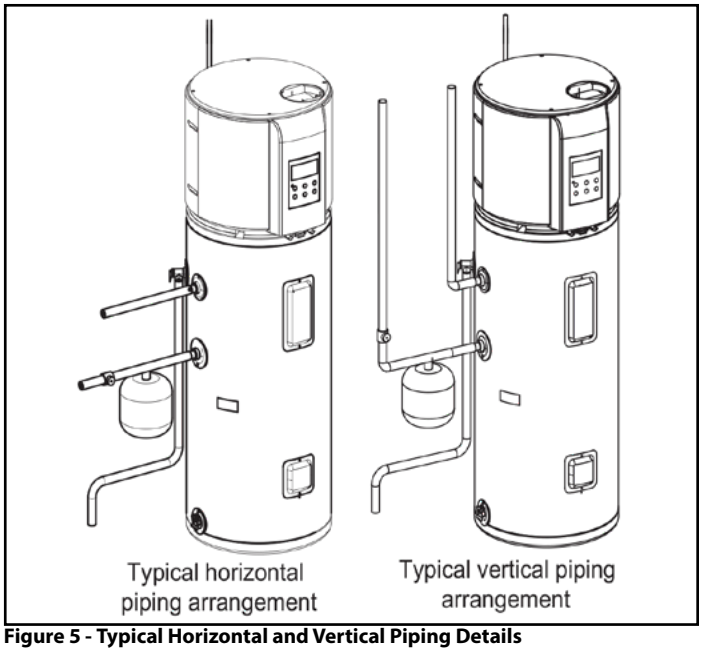


Figure 5 - Typical Horizontal and Vertical Piping Details

⚠ WARNING

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. Failure to follow this warning could result in explosion, property damage, personal injury, or death.

The BTUH 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 the front of the water heater (1 watt = 3.412 BTUH).

Connect the outlet of the relief valve to a suitable open drain so that the discharge water cannot contact live electrical parts or persons and to eliminate potential water damage.

Piping 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.

⚠ WARNING

To reduce the risk of excessive pressures and temperatures in this water heater, install temperature and pressure protective equipment required by local codes and no less than a combination temperature and pressure relief valve certified by a nationally recognized testing laboratory that maintains periodic inspection of production of listed equipment or materials, as meeting the requirements for Relief Valves and Automatic Gas Shutoff Devices for Hot Water Supply Systems, ANSI Z21.22. This valve must be marked with a maximum set pressure not to exceed the marked maximum working pressure of 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 circumstances.

Failure to follow the instructions in this warning could result in explosion, property damage, personal injury, or death.

D. Condensation Drain Tubes

This unit has a built-in condensation tray to collect moisture discharge from the evaporator coil. The water collected in the tray drains out of the tube on the back of the unit. Two flexible hoses are included with this unit. It is important that both of these hoses are attached to the two drain ports on the back of the unit.

Attach the shorter 3" hose to the top drain port.

Cut a 1 ½" piece off the long hose. Connect this piece to one end of the elbow barbed fitting (included). Attach longer piece of the hose to the other end of the barbed fitting.

Next, connect the short section with attached barbed fitting to the lower drain port on the back of the unit, below the rear cover. See Figure 6.

Direct the longer end to a drain in the floor or no higher than 3' above the floor. If such a drain is unavailable, a condensate drain pump (not provided) must be purchased and installed.

NOTE: If condensate hose is kinked during shipping, DO NOT INSTALL ON THE UNIT. A kinked hose should not be used, as condensate flow may be compromised and overflow could occur. Replace kinked hose with hose of the same size, available at most hardware or plumbing supply stores.

CAUTION

The condensate line must remain unobstructed. If condensate is allowed to freeze in the line or obstructed in any other manner, condensate can exit from the water appliance tee, resulting in potential water damage to property.

When installing a condensate pump, select one approved for use with condensing appliances. The condensate pump should have an overflow switch to prevent property damage from spillage.

Do not attach the same hose to both condensate ports. Doing so will lead to improper operation, condensate leakage, and property damage. Such damage IS NOT covered by warranty.

CAUTION

Failure to properly drain condensate could lead to water leakage and property damage. Such damage IS NOT covered by warranty.

E. Filling the Water Heater

CAUTION

The tank must be full of water before water heater is turned on. The water heater warranty does not cover damage or failure resulting from operation with an empty or partially empty tank (a condition known as dry-firing).

1. Make certain that the drain valve is completely closed.
2. Open the shut-off valve in the cold water supply line.
3. Open each hot water faucet slowly to allow the 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.

F. Electrical Connnections

The water heater must be wired to a separate 30 amp, 240V circuit with copper conductors, surge protective device, and suitable disconnecting means provided by a qualified electrician. All wiring must conform to local codes or the latest edition of the National Electrical Code ANSI/NFPA 70.

The water heater is completely wired to the junction box at the top of the water heater. An opening for a ½" or ¾" electrical fitting is provided for field wiring connections.

The voltage requirements and wattage load for the water heater are specified on the rating label on the front of the water heater.

The branch circuit wiring should include either:

1. Metallic conduit or metallic sheathed cable approved for use as a grounding conductor and installed with fittings approved for the purpose.
2. Nonmetallic sheathed cable, metallic conduit, or metallic sheathed cable not approved for use as a ground conductor shall include a separate conductor for grounding. It should be attached to the ground terminals of the water heater and the electrical distribution box.

CAUTION

Do not mis-wire electrical connections. 240V AC must be applied to the L1 and L2 wires shown in Figure 7. Failure to properly wire the water heater may damage the compressor or other electrical components. Such failure will VOID the warranty.

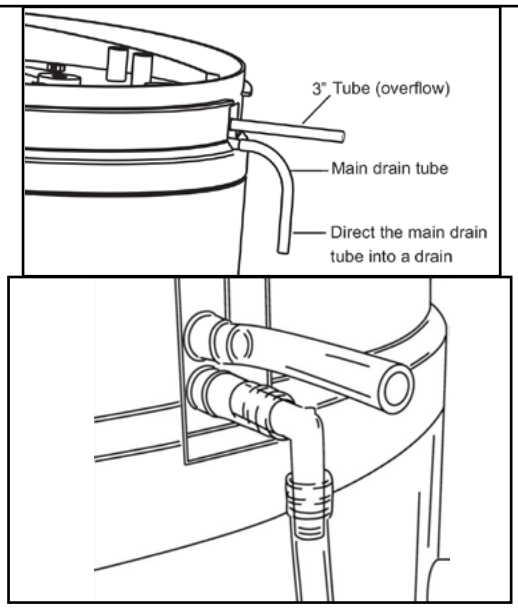


Figure 6 - Condensate Detail

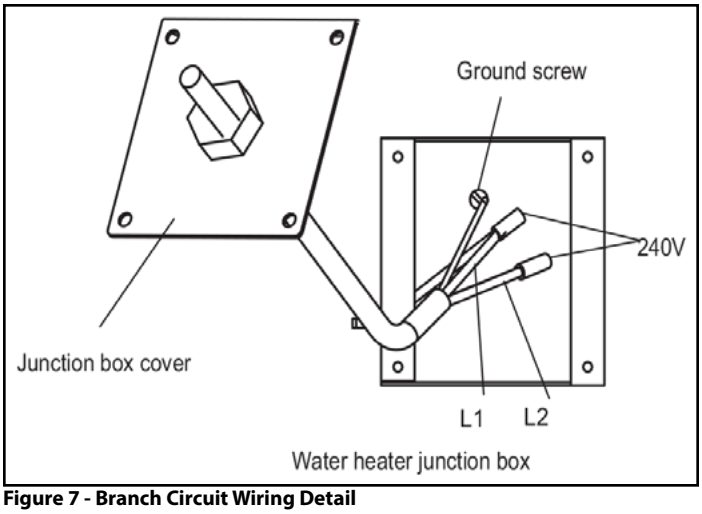


Figure 7 - Branch Circuit Wiring Detail

WARNING

A proper ground connection is essential. The presence of water in the piping and water heater does not provide sufficient conduction for a ground. Nonmetallic piping, dielectric unions, flexible connectors, etc., can cause the water heater to be electrically isolated. Improper grounding could result in severe personal injury or death due to electric shock.

Total Water Heater Wattage	Recommended Over-Current Protection (Fuse or Circuit Breaker Amperage Rating)	
	208V	240V
4,500	30	25
	Copper Wire Size AWG Based on NEC Table 310-16 (75ºC)	
	208V	240V
	10	10

Table 3 - Branch Circuit Sizing Guide

NOTE: The manufacturer recommends minimum branch circuit sizing based on the National Electric Code. Refer to wiring diagrams in this manual for field wiring connections.

The water heater 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.

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, blankets, or water pipe insulation to this water heater will require careful attention to the following:

- Do not cover the temperature and pressure relief valve.
- Do not cover access panels to the heating elements.
- Do not cover the electrical junction box of the water heater.
- Do not cover the operating or warning labels attached to the water heater or attempt to relocate them on the exterior of the insulation blanket.
- Do not block any air inlets.

G. Cool Air Output Adapter (Optional Installation)

This heat pump water heater produces cool air as it operates. When the Cool Air Output Adapter is installed on the water heater, this cooled air may be piped up to sixteen (16) feet away to cool the living space.

NOTE: The diameter of the air pipe must be eight (8) inches. Total pipe length must be no greater than sixteen (16) feet. Air pipe must be properly supported.

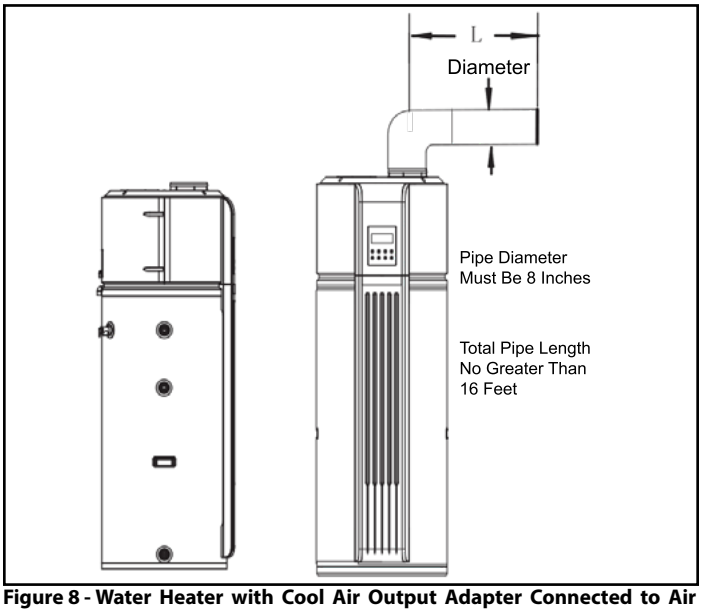


Figure 8 - Water Heater with Cool Air Output Adapter Connected to Air Pipe

CAUTION

The Cool Air Output Adapter is not designed as a load-bearing device, and must not be used to support air piping. Air pipes must be properly connected and supported. Failure to properly support vent piping could result in product or property damage. Such damages are not covered by product warranty.

Part 4 - Controls

A. Overview - See Figure 9

1. Display

2. Up Arrow Button

Increases data values or scrolls up a page.

3. Running Light

An illuminated light means the water heater is running. If the light is not lit the water heater has stopped running. A flashing light means the water heater is in error and under protection.

4. Power Button

Starts or shuts down the water heater. **NOTE:** When the water heater is in stand-by mode, this function can still be used.

5. Vacation Button

Use this button during extended periods of no water usage, such as when on vacation.

6. Down Arrow Button

Decreases data values or scrolls down a page.

7. ENTER Button

Confirms inputs and locks or unlocks the key pad. Press ENTER for three (3) seconds to unlock the key pad.

8. MODE Button

Allows users to choose an operating mode.

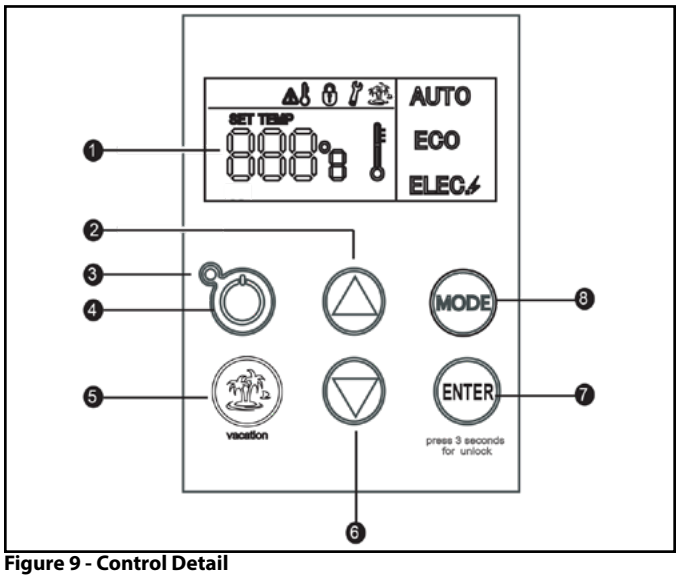


Figure 9 - Control Detail

Detailed Description of Control Functions

1. Auto-Confirm Function

Ten (10) seconds after pressing control pad keys, the auto-confirm function automatically accepts entered data and returns the water heater into operating mode.

2. Auto-Lock Function

If control pad keys have not been pressed for one (1) minute, the control pad will automatically lock. To unlock the control pad, press and hold ENTER for three (3) seconds.

3. Diagnostic Function

This function allows service technicians or users to view water heater parameters. To open the Diagnostic Function, press and hold ENTER for three (3) seconds to unlock the control. Once the control is unlocked, press the ENTER and the UP Arrow buttons simultaneously for one (1) second. This will allow the user to view the water heater parameters. To exit, press the ENTER and UP Arrow buttons simultaneously.

4. Screen Save

To extend display life, the display will dim when there is no operation for a period of time. Press any key to light the screen.

B. Display Overview - See Figure 10

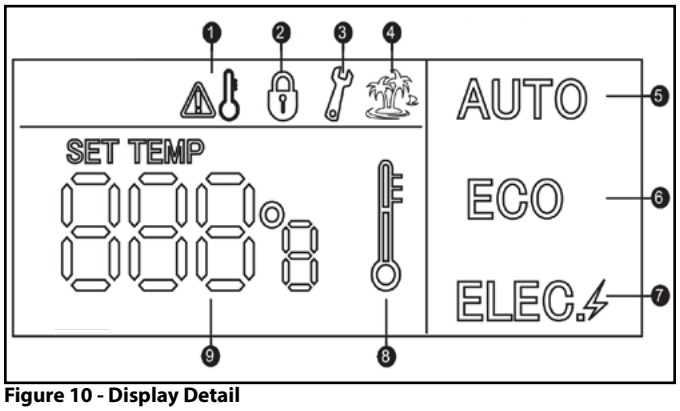


Figure 10 - Display Detail

1. High Temperature Setting

This icon will light if the temperature set by user or actual temperature is above 120°F, and shut off if water temperature is less than 120°F or when the display is in screen save mode.

2. Lock Icon

This icon lights when the key pad is locked and will shut off when the key pad is unlocked.

3. Alarm Icon

The alarm icon will flash and an alarm will sound when the water heater is in error and under protection, and continue to flash and sound until the reason for the error is solved or the water heater is

reset.

4. Vacation

The Vacation icon lights when Vacation Mode is in use. Vacation Mode greatly reduces energy usage. See Section E for more on Vacation Mode.

5. Auto Mode Icon

This icon will flash slowly when the water heater is in Auto Mode. See Section D for more on Auto Mode.

6. Economy Mode Icon

This icon will flash slowly when the water heater is in Economy Mode. See Section D for more on Economy Mode.

7. Electric Mode Icon

This icon will flash slowly when the water heater is in Electric Mode. See Section D for more on Electric Mode.

8. Water Temperature Mode Icon

This icon has three phases:

- When water temperature is less than 140ºF and set point water temperature is greater than 120ºF, all three phases will be lit.
- When water temperature is less than 120ºF and set point water temperature is greater than 110ºF, the lower two phases will be lit.
- When water temperature is less than 110ºF and set point water temperature is greater than 100ºF, the lowest phase will be lit.

10. Main Screen

The main screen will light when the power supply is connected, or when a button is pressed and the water heater leaves screen save mode.

During normal usage, the main screen shows water temperature.

Pressing and holding ENTER and UP simultaneously at the unlock screen for three (3) seconds will query water heater diagnostic functions. Parameters display on this screen.

Error or protection codes are displayed when the water heater is in error or protection. The main screen returns to normal when error or protection code is cleared.

C. Setting the Water Temperature

The temperature of the water in the water heater can be regulated by adjusting the temperature setting up or down using the Arrow buttons on the control panel.

Consider safety and energy conservation when selecting the water heater temperature setting. The lower the temperature setting, the greater the savings in energy and operating costs. To comply with safety regulations, water temperature is factory set at 120ºF. This is the recommended starting set point.

Water temperatures above 125ºF can cause severe burns or death from scalding. Be sure to read and follow the warnings outlined in this manual and on the label located on the water heater near the upper element access panel.

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.

⚠ WARNING

Households with small children, disabled, or elderly persons may require a 120ºF or lower temperature setting to prevent severe personal injury or death due to scalding.

Approximate Time / Temperature Relationships in Scalds	
120ºF	More than 5 minutes
125ºF	1 1/2 to 2 minutes
130ºF	About 30 seconds
135ºF	About 10 seconds
140ºF	Less than 5 seconds
145ºF	Less than 3 seconds
150ºF	About 1 1/2 seconds
155ºF	About 1 second

Table 4 - Approximate Time / Temperature Relationships in Scalds

To Adjust Water Heater Temperature

First, unlock the key pad by pressing and holding ENTER for three (3) seconds. Next, press the UP or DOWN Arrows to increase or decrease the water temperature. If increasing the water temperature setpoint above 120ºF, a CAUTION triangle and thermometer icon will appear on the appliance display to warn that raising the water temperature also increases scalding risk.

When the desired temperature setting is displayed, wait ten (10) seconds for the Auto-Confirm Function to automatically accept it.

D. Adjusting Water Heater Operating Modes

This water heater is factory programmed to operate in Auto Mode. Auto Mode is the recommended setting for this water heater, but can be changed if desired. Available modes are listed below and can be found by pressing the MODE button when the water heating control is unlocked.

Economy Mode

Economy Mode is the most energy efficient, and takes heat from the surrounding air to heat the water. It takes more time to heat water in Economy Mode, so this mode may NOT be sufficient to meet high-demands, such as those of a large household.

Electric Mode

Electric Mode uses only the upper and lower heating resistance elements to heat water. It takes less time to heat water, but Electric Mode is also the LEAST efficient operating mode.

Auto Mode – FACTORY RECOMMENDED DEFAULT SETTING

Auto Mode combines the energy efficiency of Economy Mode with the recovery speed and power of Electric Mode. Auto Mode is recommended for normal hot water usage.

To access any of these modes:

1. Press and hold ENTER for three (3) seconds to unlock the key pad.
2. Press the MODE button.
3. Select the desired operating mode by pressing the UP and DOWN Arrows to scroll through the options.
4. Once the operating mode is selected, wait ten (10) seconds for the Auto-Confirm Function to automatically accept the mode.

E. Vacation Mode and Locking the Control

Vacation Mode

This mode is meant for use when hot water will not be needed for an extended period of time. In Vacation Mode, the water heater temperature setpoint is reduced to 50ºF uses the most efficient heating mode to conserve energy. The unit automatically resumes heating one day before your return, so hot water will be available.

To use Vacation Mode:

1. Press and hold ENTER for three (3) seconds to unlock the key pad.
2. Press the VACATION button.
3. Press the UP and DOWN Arrows to select the # of days you will be away (default is seven [7] days). Then wait ten (10) seconds for the Auto-Confirm Function to automatically accept the number of days.

For example, if you will be gone fourteen (14) days, select 14 with the key pad. The water heater will then automatically drop the setpoint temperature to 50ºF for thirteen (13) days. At the end of the 13th day, the water heater will automatically return to the previous operating

mode and heat the water to the original temperature setpoint.
The green light will be lit when Vacation Mode is on, indicating that the control is locked.

Control Lock

The key pad can be locked out to prevent accidental key inputs. Simply do not press any keys for ten (10) seconds. The display will show the lock icon. No other key inputs will be allowed when the controls are locked.
To deactivate the lock, press and hold ENTER for (3) three seconds. The lock icon will disappear and the screen will return to the default display.

F. Using the Buttons in Combination

1. Temperature Measurement Conversion

The display is factory programmed to display temperature readings in Fahrenheit (F). To show the temperature in Celsius (C), press and hold the ENTER and MODE buttons simultaneously for one second when the display is unlocked. To change from Celsius to Fahrenheit, repeat the process.

2. Diagnostic Function

To query appliance diagnostics, press and hold the ENTER and UP buttons simultaneously for one second. After opening the Diagnostic Function, use the UP and DOWN Arrows to scroll through the diagnostics.

Display Code (2)	Description	Value (1)
2	Actual Temperature	T2, Water Tank Temperature
31		T3a, Evaporator Inlet Temperature
32		T3b, Evaporator Outlet Temperature
4		T4, Compressor Discharge Temperature
5		T5, Ambient Temperature
6	Actual Current	Current Value
7	Malfunction Protection Code	Most Recent Error
8		Second Most Recent Error
9		Third Most Recent Error
A	Fan Motor Operating Time 1	Actual Operating Time = Fan Motor Operating Time 1 + Fan Motor Operating Time 2
b	Fan Motor Operating Time 2	
C	Heat Pump Protection Counter	Heat Pump Protection Counter

Table 6 - Diagnostic Function List - See Figure 11 for location of Value (1) and Display Code (2)

To exit appliance diagnostics, press and hold the ENTER and UP Arrow buttons simultaneously for one second. The appliance will exit automatically after one minute of inactivity.

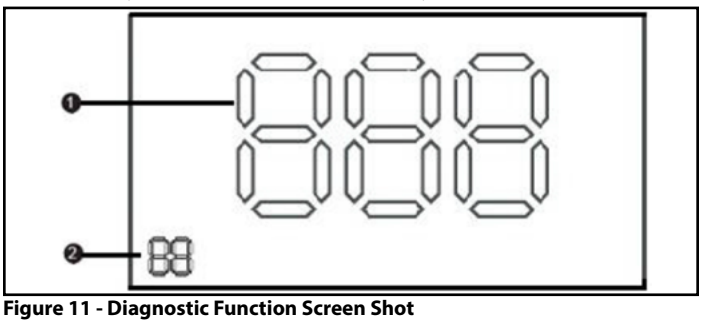


Figure 11 - Diagnostic Function Screen Shot

3. Clear Malfunction

To clear malfunction, unlock the display. Then press and hold the ENTER and DOWN Arrow buttons simultaneously for one second. Press the POWER button to restart normal operation.

4. Clear Alarm

To clear the alarm, press and hold the ENTER and VACATION buttons simultaneously for one second.

Part 5 - Installation Checklist

Water Heater Location	Yes	No
Is room size less than 10' x 10' x 7' (700 cu. ft.)? If yes, a louvered door or similar ventilation is needed.		
Rear of the unit 7" away from a wall		
Front of the unit clear of any obstructions		
Close to area of heated water demand		
Indoors and protected from freezing temperatures		
Water heater installed level		
Area free of flammable vapors		
Provisions made to protect area from water damage (catch pan) and control thermal expansion		
Sufficient room to service heater		
Relief Valve	**Yes**	**No**
Temperature and Pressure Relief Valve properly installed and discharge line run to open drain		
Discharge line protected from freezing		
Wiring	**Yes**	**No**
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		
Electrical connections allow air filter removal		
Water Supply	**Yes**	**No**
Water heater completely filled with water BEFORE operating the unit		
Air purged from water heater and piping		
Water connections tight and free of leaks		
Water connections allow air filter removal		
Condensate	**Yes**	**No**
Short tube is installed on the upper drain nozzle and directed to a catch pan or floor drain		
Longer tube is installed on the lower drain nozzle and directed into a floor drain or condensate pump		
Miscellaneous	**Yes**	**No**
Control Panel displays 120°F in Auto Mode on Start-Up		
Front cover is in place		

Table 5 - Installation Checklist

Part 6 - Start-Up: What to Expect

After the water heater has been installed with all electrical and water connections secure and checked, fill the unit with water. While filling, vent the tank by opening a hot water faucet somewhere in the home at the highest point in the system. When water flows freely, the tank is full.

After the tank is full energize the water heater. Press the POWER button on the user interface to turn the water heater on. Once powered, the control will display a reminder to ensure the water heater is full. Press POWER again to acknowledge that the water heater is full.

NOTE: Table 7 outlines what to expect next.

Elapsed Time	Water Heater Actions	Comments
0 to 1.5 minutes	Unit is silent	This initial 3 minute off time prevents compressor damage
1.5 to 3 minutes	Fans turn on	
3 to 8 minutes	Compressor turns on and runs for 5 minutes	This 5 minute period ensures the tank is full of water (dry-fire prevention)
8 to 30 minutes	Compressor turns off. Upper element turns on for about 20 minutes	Quickly provides the initial amount of hot water for user (about 25 gallons)
30 minutes and beyond	Upper element turns off and compressor turns back on	Uses efficient heat pump for the majority of heating

Table 7 - Water Heater Start-Up

NOTE: The heat pump ambient temperature operating range is 45 to 120ºF. If the ambient temperature is outside this range, the heat pump will not be able to run and the backup electric elements will operate until the ambient temperature returns to operating range.

Part 7 - Maintenance, Vacation, and Cleaning

A. Routine Preventative Maintenance

⚠ WARNING

Before manually operating the relief valve, make certain no one will be exposed to the hot water released by the valve. The water may be hot enough to create a scald hazard. The water should be released into a suitable drain to prevent property damage, severe personal injury, or death from scalds.

NOTE: If the temperature and pressure relief valve on the hot 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.

If properly maintained, your water heater will provide years of dependable, trouble-free service. It is suggested that a routine preventive maintenance program be established and followed by the user.

Periodic Inspection

It is further recommended that a periodic inspection of the operating controls, heating elements, and wiring should be conducted by service personnel qualified in electric water heater repair.

Most electrical water heaters, even when new, make some sound when in operation. If the hissing or singing sound level increases excessively, the electric heating element may have scale buildup and require cleaning or replacement. Contact a qualified installer or plumber for inspection.

Temperature and Pressure Relief Valve

At least once a year, lift and release the lever handle on the temperature and pressure relief valve, located on the back left side of the water heater, to make sure the valve operates freely. Allow several gallons of water to flush through the discharge line to an open drain.

⚠ WARNING

Before manually operating the relief valve, make certain no one will be exposed to the hot water released by the valve. The water drained from the tank may be hot enough to present a scald hazard. Failure to do so could lead to property damage, serious personal injury, or death.

Flushing the Tank

The water heater tank can act as a settling basin for solids suspended in water. It is therefore not uncommon for hard water deposits to accumulate in the bottom of the tank. To clean the tank of these deposits, open the drain valve (located under the large decorative cover near the bottom of the unit) and drain a few quarts of water from the water heater every month.

B. Draining the Water Heater

⚠ WARNING

Shut off power to the water heater before draining water. Failure to do so could lead to property damage, serious personal injury, or death.

Attach a garden hose to the drain valve located at the bottom of the unit and direct the hose to a drain. The decorative front cover must be removed to access this valve.

In order to completely drain the water heater, turn off the cold water supply. Open a hot water faucet or lift the handle on the relief valve to admit air into the tank.

Open the drain valve. When done draining, close the drain valve, reopen the cold water supply, and refill the tank. Open a hot water faucet to vent the system of air.

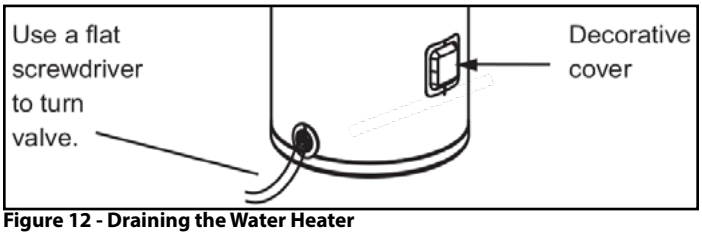


Figure 12 - Draining the Water Heater

C. Vacation and Extended Shutdown

If the water heater is to remain idle for an extended period of time, the power and water to the water heater should be turned off to conserve energy and prevent a buildup of dangerous hydrogen gas.

The water heater and piping should be drained if they might be subjected to freezing temperatures.

After a long shutdown period, the water heater controls and operation should be checked by qualified service personnel. Make certain the water heater is completely refilled before placing it in operation.

⚠ WARNING

Hydrogen gas can be produced in a hot water system 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 reduce the risk of injury or death, it is recommended that the kitchen sink hot water faucet be opened for several minutes before using any electrical water heater connected to the hot water system. If hydrogen is present, there will be an unusual sound, such as air escaping through the pipe as water begins to flow. Do not smoke or use an open flame near the faucet while it is open. Failure to do so could lead to property damage, serious personal injury, or death.

D. Cleaning the Filter

In Auto and Economy modes, the water heater moves air through the system and out of the back of the unit. The filter is in place to protect the evaporator from dirt or dust.

A clean air filter is important to achieve highest efficiency. This filter needs to be cleaned at least once a year. When the filter requires cleaning, an alarm will sound. The screen will display instructions that the filter needs to be cleaned.

NOTE: If the filter gets too dirty for the heat pump to operate properly, the unit will automatically switch to Electric Mode and energy savings will be lost.

Leave the power on and remove the filter from the top of the water heater. Grasp the handle and slide the filter up until it clears the cover. Once the filter has been removed, wipe it clean with a damp rag, or rinse it in warm water.

After the filter has been cleaned, it can be replaced by aligning it into the slot in the top of the water heater and sliding it down into place. When the handle is flush with the top of the cover, it is seated.

When the clean filter has been reinstalled, press ENTER.

IMPORTANT: The filter must be cleaned when the alarm is sounded. A dirty filter will make the system work harder and result in reduced efficiency and possible damage to the system. For the best available energy efficiency ensure the filter is clean.

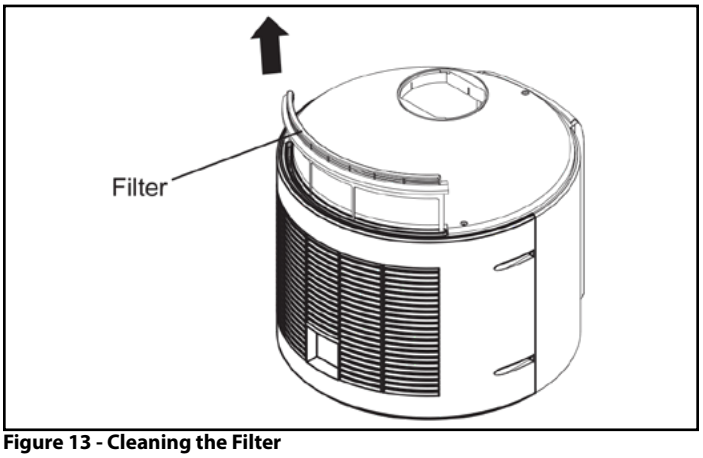


Figure 13 - Cleaning the Filter

E. Clearing the Condensation Drain Tubes

There are two drain hoses that are attached to the back of the water heater. If both of these clog, water will spill down the outside of the unit.

The primary drain is intended to carry all condensate away. If it is clogged or the hose is kinked, the condensate will exit the secondary drain tube and onto the floor. This is intended as a notification to the user that the primary drain is clogged. Remove the drain hose, clear any debris, and reattach.

Periodically inspect the drain lines and clear any debris that may have collected in the lines.

Part 8 - Troubleshooting

Before calling for service, follow the troubleshooting tips below. It may not be necessary to call for service.

CAUTION

For your safety, DO NOT attempt repair of electrical wiring, controls, heating elements, or safety devices. Refer repairs to qualified service personnel.

Problem	Possible Causes	What to Do
Water heater is noisy	Fans are used to move air through the system. Fan noise volume will vary as water is heated.	Some amount of fan noise is normal (similar to the blower on a central heating or cooling system). If you hear an abnormal noise, like a knocking sound, or the noise level seems unusually loud, contact service.
		If noise level has been increasing over the last weeks or months, the filter may be dirty, thus making the fans work harder. Clean the filter.
Water heater is making the room too cold	Room is not vented properly or is too small	If the room is smaller than 10′ x 10′ x 7′, the installation must have a louvered door or other means to allow air exchange with surrounding rooms.
Water dripping down the outside of the water heater	Condensate drain hoses are not connected	Two drain hoses are included with your water heater. Connect the longer 6′ hose to the lower condensate drain port. Connect the short 3″ hose to the upper condensate drain port.
	Condensate drain hoses are kinked or clogged	Remove each drain hose and clear any debris from the line. You can use a wire hanger or small screwdriver to clear out any debris in the drain port on the unit.
	Inlet/Outlet water connections are not tightened	Tighten the inlet and outlet pipe connections. **NOTE:** DO NOT OVER-TIGHTEN.
Not enough or no hot water	Water usage may have exceeded the capacity of the water heater	Wait for the water heater to recover after abnormal demand.
	Fuse is blown or circuit breaker tripped	Replace fuse or reset circuit breaker.
	Electric supply may be off	Make sure electric supply to water heater and disconnect switch, if used, are in the ON position.
	Water temperature may be set too low	See Setting the Water Temperature, this manual.
	Leaking or open hot water faucets	Make sure all faucets are closed.
	Electric service to your home may be interrupted	Contact the local electric utility.
	Improper wiring	Do not attempt to repair wiring. Call for service.
	Manual reset limit (TCO)	A tripped TCO could mean there is a serious issue with the water heater. Call for service.
	Cold water inlet temperature may be colder during winter months	This is normal. Colder inlet water takes longer to heat.
Water is too hot	Water temperature is set too high	See Setting the Water Temperature, this manual.
	Electronic control has failed	Call for service.
Rumbling Noise	Water conditions in your home caused a buildup of scale or mineral deposits on the heating elements	Call for service.
Relief valve producing popping noise or draining	Pressure buildup caused by thermal expansion to a closed system	This unacceptable condition must be corrected. Contact the water supplier or plumbing contractor for service. Do not plug the relief valve outlet.
An alarm sounds and the screen states, "The Filter Needs Cleaning."	The filter requires cleaning. A clean filter is necessary for effective operation	Follow the instructions on how to remove and clean the filter, this manual.
Water heater is not making noise / does not seem to be working	The water heater operates quietly in Electric mode. The fan will operate when in Auto or Econ mode.	Check the water heater for error codes. If there are no error codes, check the selected operating mode. The water heater will operate quietly in Electric mode. If the display does not illuminate, ensure there is power to the water heater.

Table 8 - Troubleshooting

The following table describes error codes and possible solutions. If your water heater displays an error code, call a qualified service agent to fix the problem.

Error Code	Description	What to Do
ALL	ALL	Inspect for proximity to high voltage power sources.
E0	T2 Sensor Error	1. Check if sensor wires are correctly connected and/or damaged.
		2. Check if T2 sensor is damaged. Check T2 sensor resistance.
		3. Check actual temperature in Celsius (0 - 60°C) (tolerance +5°C)
E1	T3a Sensor Error	1. Check if sensor wires are correctly connected and/or damaged.
		2. Check if T3a sensor is damaged. Check T3a sensor resistance.
		3. Check actual temperature. Range is 23 - 86°F.
		4. Check for damage to TXV and/or capillary probe.
E4	T3b Sensor Error	1. Check if sensor wires are correctly connected and/or damaged.
		2. Check if T3b sensor is damaged. Check T3b sensor resistance.
		3. Check actual temperature. Range is 32 - 86°C.
E5	T4 Sensor Error	1. Check if sensor wires are correctly connected and/or damaged.
		2. Check if T4 sensor is damaged. Check T4 sensor resistance.
		3. Check actual temperature. Range is 86 - 230°F.
		4. Check for refrigerant leakage or damaged piping.
E6	T5 Sensor Error	1. Check if sensor wires are correctly connected and/or damaged.
		2. Check if T5 sensor is damaged. Check T5 sensor resistance.
		3. Check position of sensor tab, flat to be at the back.
E7	Heat Pump Error	1. Power the water heater off and restart.
		2. Press ENTER and the UP Arrow simultaneously to enter Diagnostic Functions and check error code history.
E8	Water Temperature Too High (T2 greater than 165°F)	1. Check if sensor wires are correctly connected and/or damaged.
		2. Check if T2 sensor is damaged. Check T2 sensor resistance.
		3. Power water heater off and restart.
		4. Replace T2 sensor.
P0	Run Condition C	The water heater checks this condition every 30 minutes. T3a temperature should be greater than 32°F. Recheck water heater after 30 minutes.
P1	Run Condition D	The water heater checks this condition every 30 minutes. Readings from (T3b - T3a) sensors must be greater than 3°F.
P2	Run Condition E	The water heater checks this condition continuously. T4 sensor must be greater than 240°F.
P4	High Compressor Current	1. Ensure compressor operating current and voltage match the rating label.
		2. Check if compressor or related connections are damaged.
P5	Air Filter Needs Cleaning	1. Remove the air filter and clean with water or compressed air.
		2. Press and hold the ENTER and DOWN Arrow simultaneously to reset system.
P6	Run Condition A	The water heater checks this condition 5 minutes after compressor start-up. T4 temperature must increase greater than 15°F.
P7	Run Condition B	The water heater checks this condition every 30 minutes. T4 temperature should be greater than 100°F.
P8	Upper Element Error	1. Power the water heater off and restart.
		2. Check electrical supply voltage.
		3. Remove cover and check element connections and/or damage.
		4. Check for damage to power wire through current sensor loop in control board.
PA	Lower Element Error	1. Power the water heater off and restart.
		2. Check electrical supply voltage.
		3. Remove cover and check element connections and/or damage.
		4. Check for damage to power wire through current sensor loop in control board.

Table 9 - Error Codes - NOTE: See Figure 16 for Sensor Locations.

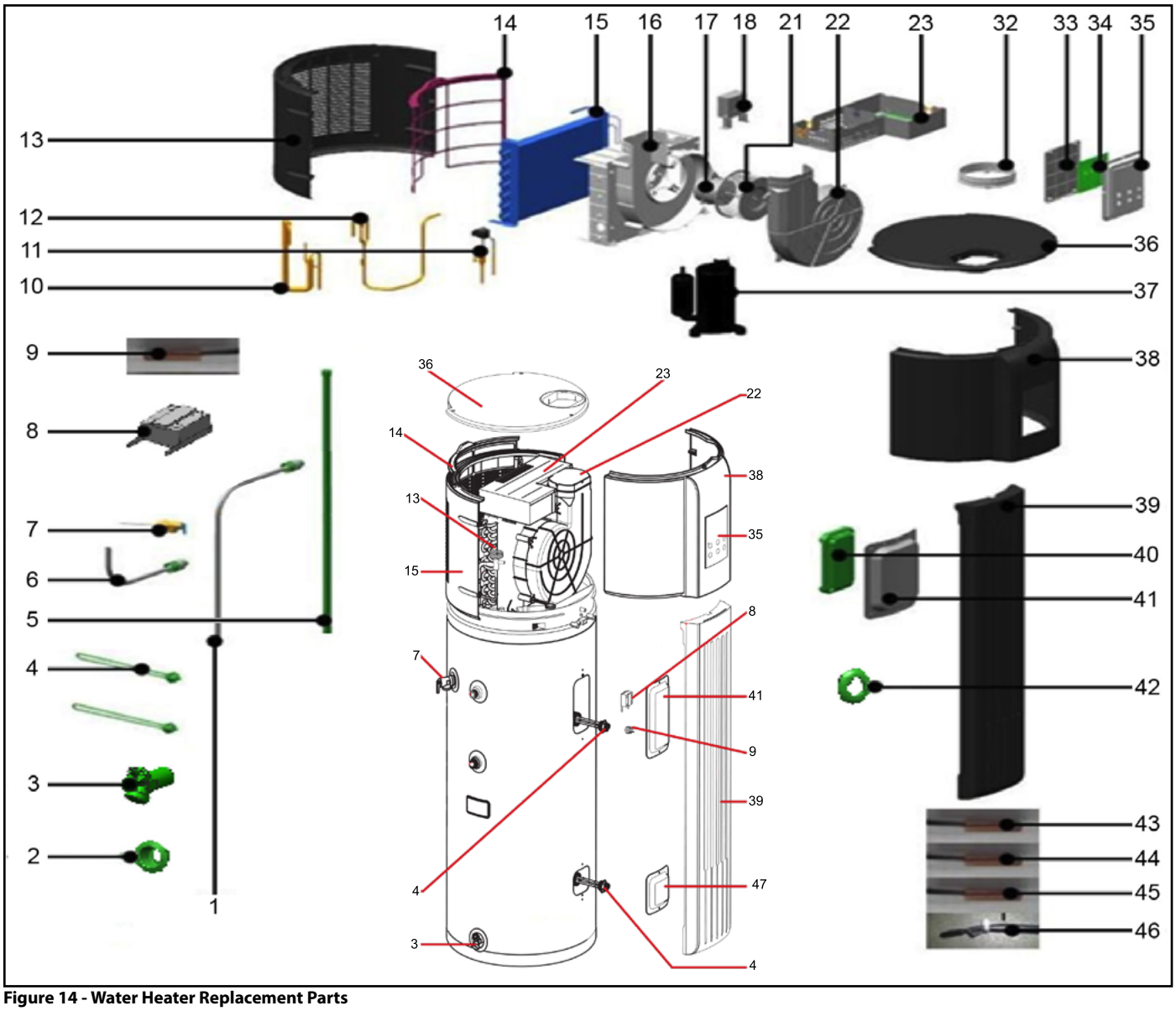


Figure 14 - Water Heater Replacement Parts

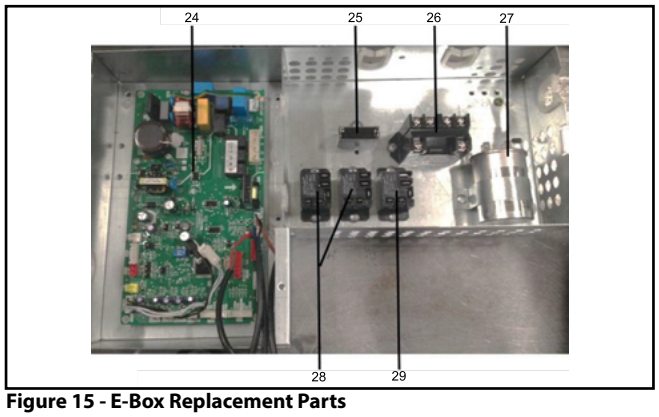


Figure 15 - E-Box Replacement Parts

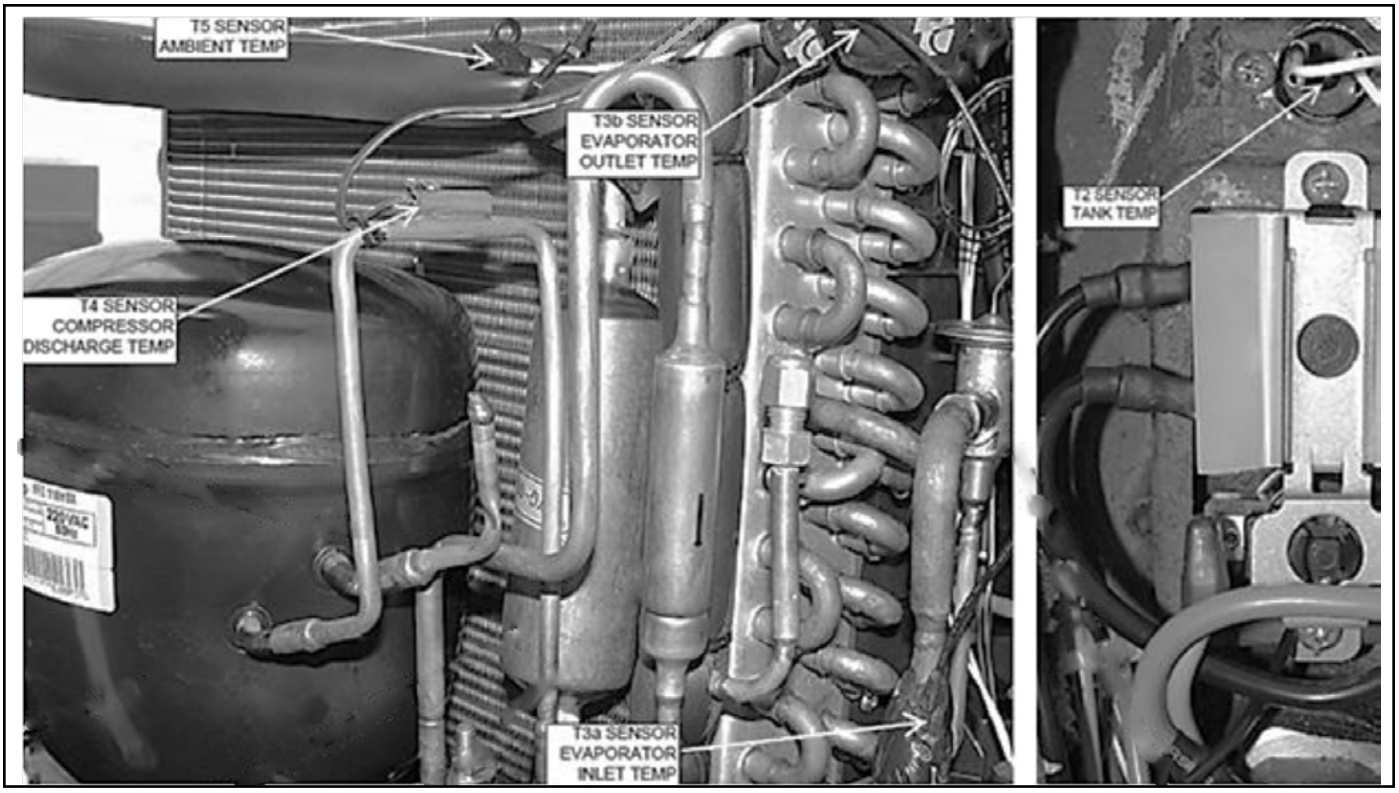


Figure 16 - Sensor Locations

Item #	Description	Part #	Item #	Description	Part #
1	Inlet Water Pipe	7200P-050	**25**	Capacitor	7200P-062
2	T&P Finishing Flange	7200P-051	**26**	Dual Relay	7200P-063
3	Drain Valve	7200P-052	**27**	Capacitor	7200P-064
4	Electric Heating Element	7200P-053	**28**	Relay	7200P-065
5	Magnesium Anode Rod	7200P-054	**29**	Relay	7200P-066
6	Outlet Water Pipe	7200P-055	**30**	Control Board Housing	7200P-087
7	T&P Relief Valve	7200P-056	**31**	Control Board Housing Cover	7200P-088
8	TCO	7200P-057	**32**	Adapter Ring	7200P-067
9	Temperature Sensor T2	7200P-075	**33**	Display Cover	7200P-068
10	Discharge Pipe Assembly	7200P-076	**34**	Display Board Assembly	7200P-069
11	Expansion Valve Assembly	7200P-077	**35**	Display Panel	7200P-070
12	Suction Pipe Assembly	7200P-078	**36**	Top Cover	7200P-071
13	Rear Panel	7200P-058	**37**	Rotary Compressor	7200P-089
14	Filter	7200P-059	**38**	Front Panel	7200P-072
15	Evaporator Assembly	7200P-079	**39**	Decorative Front Cover	7200P-073
16	Front Volute Shell	7200P-080	**40**	Foam Insulation	7200P-090
17	Fan Motor	7200P-060	**41**	Upper Element Cover	7200P-091
18	Wire Connecting Box Assembly	7200P-081	**42**	Finishing Flange	7200P-074
19	Wire Connecting Box Only	7200P-082	**43**	Discharge Temperature Sensor	7200P-092
20	Wire Connecting Box Cover Only	7200P-083	**44**	Pipe Temperature Sensor Assembly	7200P-093
21	Centrifugal Fan Assembly	7200P-061	**45**	Pipe Temperature Sensor	7200P-094
22	Rear Volute Shell	7200P-084	**46**	Room Temperature Sensor	7200P-095
23	E-Box Assembly	7200P-085	**47**	Lower Element Cover (not shown)	7200P-096
24	Control Board	7200P-086	**48**	Elbow, Hose Barb Fitting (not shown)	7200P-097

Table 10 - Replacement Parts List

Customer Installation Record Form	
The following form should be completed by the installer for you to keep as a record of the installation in case of a warranty claim. After reading the important notes at the bottom of the page, please also sign this document.	
Customer's Name	
Date of Installation	
Installation Address	
Product Name / Serial Number(s)	
Comments	
Installer's Code / Name	
Installers Phone Number	
Signed by Installer	
Signed by Customer	
Installation Notes	

IMPORTANT

Customer: Please only sign after the installer has fully reviewed the installation, safety, proper operation, and maintenance of the system. If the system has any problems please call the installer. If you are unable to make contact, please call your sales representative.
Distributor / Dealer: Please insert contact details.