

INSTALLATION AND OPERATING INSTRUCTIONS



Solar Electric Water Heater

This solar electric water heater's design is certified by Underwriters Laboratories (UL) and listed in accordance with UL 174. C-UL listed in accordance with Canadian National Standard C22.2, No. 110-M90.

This water heater must be installed in accordance with local codes. In the absence of local codes, install this water heater in accordance with the N.E.C. Reference Book (latest edition).

The warranty for this water heater is in effect only when the water heater is installed, adjusted, and operated in accordance with these Installation and Operating Instructions. The manufacturer will not be held liable for damage resulting from alteration and/or failure to comply with these instructions.

This water heater has been designed and certified for the purpose of heating potable water. The installation and use of this water heater for any purpose other than the heating of potable water, may cause damage to the water heater and create a hazardous condition and nullify the warranty.

Do not use this appliance if any part has been submerged in water. The plumbing professional responsible for the installation of this water heater should be contacted to inspect the appliance and to replace any part of the control system, including thermostat (if equipped), which has been submerged in water.

A sacrificial anode is used to extend tank life. Removal of this anode, for any reason, will nullify the warranty. In areas where water is unusually active, an odor may occur at the hot water faucet due to a reaction between the sacrificial anode and impurities in the water. If this should happen, an alternative anode may be purchased from the supplier that installed this water heater. This alternative anode will minimize the odor while protecting the tank. Additionally, the water heater should be flushed with appropriate dissolvers to eliminate any bacteria.

WARNING

Hydrogen gas can be produced in a hot water system served by this water heater when it has not been used for a long period of time (generally two 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. If 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.

WARNING

Water heaters are heat producing appliances. To avoid damage or injury, there shall be no materials stored against the water heater and proper care shall be taken to avoid unnecessary contact (especially by children) with the water heater. **UNDER NO CIRCUMSTANCES SHALL FLAMMABLE MATERIALS, SUCH AS GASOLINE OR PAINT THINNER BE USED OR STORED IN THE VICINITY OF THIS WATER HEATER OR ANY LOCATION FROM WHICH FUMES COULD REACH THE WATER HEATER.**

LOCATION

This water heater must be located in an area where leakage of the tank or water line connections and the combination temperature and pressure relief valve will not result in damage to the area adjacent to the water heater or to lower floors of the structure. When such locations cannot be avoided, a suitable drain pan must be installed under the water heater. The drain pan must be no greater than 1 1/2 in. (3.8 cm) deep and have a minimum length and width of at least 4 in. (10.2 cm) measured from the jacket of the water heater. The drain pan, as described above, can be purchased from your plumbing professional. The drain pan must be piped to an adequate drain. The piping must be pitched for proper drainage.

WATER CONNECTIONS

NOTE

Before proceeding with the installation, close the main water supply valve.

After shutting the main water supply valve, open a faucet to relieve the water line pressure to prevent any water from leaking out of the pipes while making the water connections to the water heater. After the pressure has been relieved, close the faucet. Make the proper plumbing connections between the water heater and the plumbing system in the house. Install a shut-off valve in the cold water supply line.

CAUTION

If sweat fittings are to be used, **DO NOT** apply heat to the nipples on top of the water heater. Sweat the tubing to the adapter before fitting the adapter to the water connections. It is imperative that heat is not applied to the nipples containing a plastic liner.

If this water heater is installed in a closed water supply system, such as the one having a back-flow preventer in the cold water supply, provisions shall be made to control thermal expansion. **DO NOT** operate this water heater in a closed system without provisions for controlling thermal expansion. Your water supplier or local plumbing inspector should be contacted on how to control this situation.

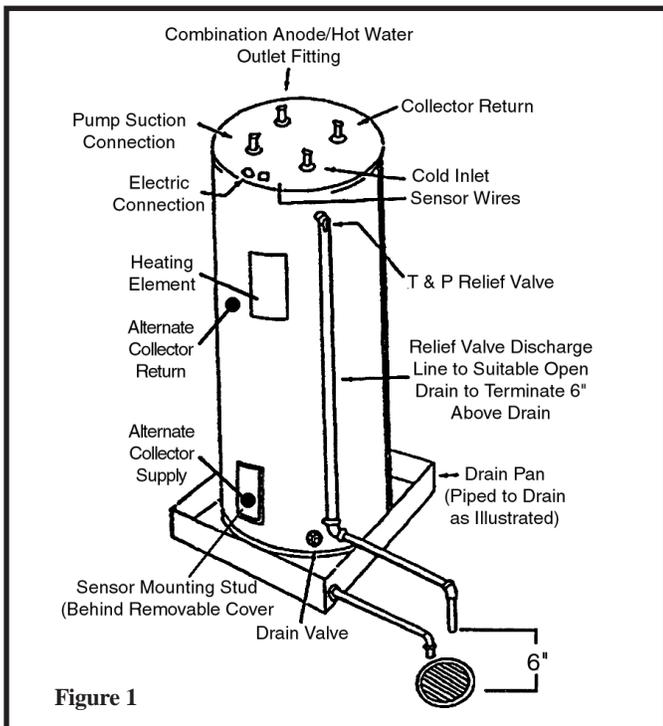
WARNING

Install the combination temperature and pressure relief valve into the opening provided and marked for this purpose on the water heater.

Install a discharge line so that water discharged from the combination temperature and pressure relief valve will exit within 6 in. (15.3 cm) above, or any distance below the structural floor and cannot contact any live electrical part. The discharge line is to be installed to allow for complete drainage of both the temperature and pressure relief valve and the discharge line. The discharge opening must not be subjected to blockage or freezing. **DO NOT** thread, plug or cap the discharge line. It is recommended that a minimum of 4 in. (10.2 cm) be provided on the side of the water heater for servicing and maintenance of the combination temperature and pressure relief valve.

Do not place a valve between the combination temperature and pressure relief valve and the tank.

This water heater is designed to be used only with forced circulation. The pump may be mounted directly on top of the unit. The plumbing professional installing the water heater has the option of using either the top or side connections for the pump suction and collector return lines (See Figure 1). If the side connections are used, the corresponding top connections must be capped (plugged). Each water heater is manufactured with plugs installed in the side connections. If the side connections are to be used, the plugs installed at the factory must be removed. Connect the inlet side of the pump to the line marked pump suction connection. Connect the outlet of the pump to the inlet of the solar connector. The outlet of the collector should be connected to the fitting marked collector return.



The two fittings on top **not** used for the pump suction and collector return lines are for connecting the cold water inlet supply and the hot water outlet supply.

A bleed valve shall be installed in the system above the level of the pump in order to bleed the air out of the water lines.

IMPORTANT

This water heater does not contain a heat exchanger, therefore, only potable water may be allowed to enter the water heater.

If this water is installed on a system utilizing any heat transfer solution other than potable water, a separate heat exchanger must be installed. A qualified heat exchanger must be constructed in such a manner that failure of the heat exchanger will not result in contamination of the potable water. If a separate heat exchanger is used, forced circulation must be used between the heat exchanger and the solar storage unit. Using either the top or side connections, connect the inlet of the pump to the pump suction connection and return line from the heat exchanger to the collector return connection.

After the installation of all water lines is complete, open the main water supply valve and fill the heater. Open several hot water faucets to allow air to escape from the system while the water heater is filling. When water passes through all the faucets, close the faucets and check for possible leaks in the system.

CAUTION

Increasing the thermostat setting above the preset temperature may cause severe burns and consume excessive energy. Hotter water increases the risk of scald injury.

This water heater can deliver scalding temperature water at any faucet in the system. Be careful whenever using hot water to avoid scalding injury. Certain appliances, such as dishwashers and automatic clothes washers may require increased temperature water. By setting the thermostat on this water heater to obtain increased temperature water required by these appliances, you may create the potential for scald injury.

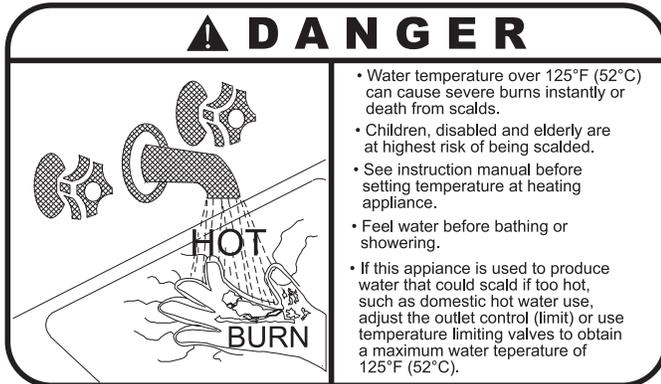
CAUTION

Under certain conditions, water in this water heater may become excessively hot. It is recommended that a thermostatically controlled tempering valve may be installed in the outlet line to reduce the risk of scald injury by preventing point of discharge water temperatures in excess of 140°F (60°C).

To protect against injury, you should install an anti-scald tempering valve in the water system. This valve will reduce point of discharge temperature by mixing cold and hot water in branch supply lines. Such lines are available from the local plumbing supplier. Please consult with a plumbing professional.

DANGER

Water temperatures over 125°F (52°C) can cause severe burns instantly or death from scalds. Children, disables, and elderly are at highest risk of being scalded. See “Temperature Adjustment” section of this manual before setting thermostat at water heater. Feel water before bathing or showering. Temperature limiting valves are available; consult local plumbing supplier.



ELECTRICAL CONNECTIONS

Before any electrical connections are made, be sure that the water heater is full of water and that the manual shut-off valve in the cold water supply line is open. Check the rating plate and wiring diagram before proceeding. This solar electric water heater was built and wired in accordance with the Underwriters Laboratories testing approvals requirements. The temperature limiting device is of the manual reset, trip-free type and has been factory installed to interrupt all ungrounded power supply conductors in the event of thermostat failure. Thermostats are factory set and wired in accordance with the wiring diagram fastened to the inside of the top access panel. The plumbing supplier in your area ordered this water heater wired at the factory to comply with the existing area codes, but local utility codes may require or allow other circuitry. Consult your local power company to determine the correct electrical hook-up in order to meet local utility and building codes and in order to obtain the most economical rates. Also check to find out if you are required to obtain a permit before starting the installation. The following chart shows the recommended fuse size for the maximum water heater wattage. The maximum wattage and rated voltage are shown on the water heater data plate. The water heater must be well grounded. **A green ground screw is provided at the electrical connection point for connecting a ground wire.**

The controller may be mounted directly on the top of the solar storage unit.

Wires are provided from the sensor mounting stud to the top of the water heater. Attach the tank sensor to these wires and mount the sensor to the tank using the stud provided on the tank. This stud is located under the cover on the lower front of the water heater. A tank sensor may be provided as an option, in which case, it may be pre-mounted and wired. Attach the wires through the top of the unit to the terminals on the Solar Differential Control.

RECOMMENDED FOR AMPERAGE

| MAX WATTS | MAX VOLTS | | |
|-----------|-----------|------|------|
| | 120V | 208V | 240V |
| 500 | 10A | 5A | 5A |
| 1000 | 15A | 10A | 10A |
| 1250 | 15A | 10A | 10A |
| 1500 | 20A | 10A | 10A |
| 2000 | 25A | 15A | 10A |
| 2500 | 30A | 15A | 15A |
| 3000 | 35A | 20A | 20A |
| 3500 | 40A | 20A | 20A |
| 4000 | | 35A | 25A |
| 4500 | | 30A | 25A |
| 5000 | | 35A | 30A |
| 5500 | | 35A | 35A |
| 6000 | | 40A | 35A |

Before closing the switch to allow electric current to flow to the water heater, make certain that the water heater is full of water and that the cold water inlet valve is open. Complete failure of the heating element will result if it is not totally immersed in water at all times. When the switch is closed, the operation of this solar electric water heater is automatic. The thermostats are preset to the “HOT” setting to provide a water temperature of approximately 120°F (49°C) to reduce the risk of scald injury.

Care must be taken whenever using hot water to avoid scalding injury. Certain appliances require high temperature hot water (such as dishwashers and automatic clothes washers).

TO FILL THE WATER HEATER:

1. Close the water heater drain valve by turning the knob clockwise.
2. Open the cold water supply shut-off valve.
3. Open several hot water faucets to allow air to escape from the system.
4. When a steady stream of water flows from the faucets, the water heater is filled. Close the faucets and check for water leaks at the water heater drain valve, combination temperature and pressure relief valve and the hot and cold water connections.

TO DRAIN THE HEATER:

Should it become necessary to completely drain the water heater, make sure you adhere to the following steps:

1. Disconnect the power supply to the heater. Consult the plumber or electric company in your area for service.

2. Close the cold water supply shut-off valve.

3. Open the drain valve on the water heater by turning the knob counter-clockwise. The drain valve has threads on the end that will allow connection of a standard hose coupling.

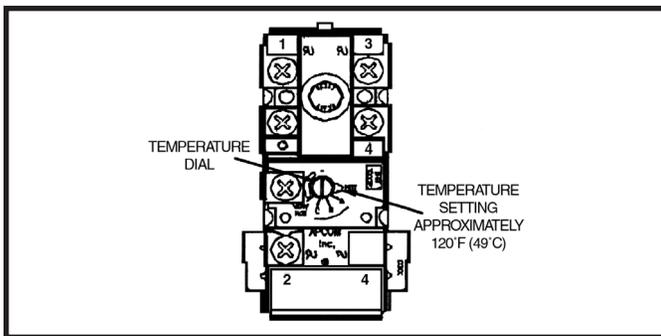
Open a hot water faucet to allow air to enter the system.

TEMPERATURE ADJUSTMENT

CAUTION

Before adjusting the thermostat(s), turn off power supply to the water heater.

The temperature of the water can be changed by adjusting the thermostat(s). Before any work is done on the water heater, disconnect all power to the water heater by opening the switch at the main electrical circuit breaker or fuse box. Remove the access panels or front panel on table tops, fold the insulation outward away from the controls. Set the thermostat(s) to the desired water temperature using a screwdriver to move the thermostat pointer. The thermostat has been factory preset to approximately 120°F (49°C). Rotate the temperature dial clockwise to increase water temperature. Replace the insulation making sure that the controls are well covered and that the plastic terminal shield has not been displaced; replace the access panel. The water heater is now ready for operation and the main switch can be closed.



DANGER

Hotter water increases the risk of scald injury. Scalding may occur within five (5) seconds at a temperature setting of 135°F (57°C). To protect against hot water injury, install an anti-scald tempering valve in the water system. This valve will reduce point of discharge water temperatures by mixing cold and hot water in branch water lines. A licensed plumbing professional or local plumbing authority should be consulted.

Note: This water heater is equipped with an energy cut out device to prevent overheating. Should overheating occur, turn off the electrical supply to the water heater and contact a qualified service technician.

IMPORTANT

The water heater should be inspected at a minimum of annually by a qualified service technician for damaged components. **DO NOT** operate this water heater if any part is found damaged.

Shut off the electric power and water supply, drain the heater completely to prevent freezing whenever the building is left unoccupied during the cold weather months. In order to ensure efficient operation and long tank life, drain the heater through the drain valve until water runs clear. Drain it at least once a month. Failure to do this may result in noisy operation and lime and sediment buildup in the bottom of the tank. Check the temperature and pressure relief valve to ensure that the valve has not become encrusted with lime. Lift the lever at the top of the valve several times until valve seats properly without leaking and operates freely.

WARNING

When lifting the level of the temperature-pressure relief valve, hot water will be released under pressure. Be certain that any released water does not result in bodily injury or property damage. The magnesium anode rod should be inspected periodically and replaced when necessary to prolong tank life.

CAUTION

For your safety, **DO NOT** attempt to repair thermostat(s), heating elements, or electrical wiring. Refer such repairs to a qualified service technician.

Contact your supplier or plumbing professional for replacement parts or contact the company at the address displayed on the rating plate of the water heater.

For faster and better service, please provide the part name, model, and serial number(s) of the water heater(s) when ordering parts.

READ THE WARRANTY FOR A FULL EXPLANATION OF THE LENGTH OF TIME THAT PARTS AND THE WATER HEATER ARE WARRANTED.

Complete the following information and retain for future reference:

Model No.: _____

Serial No.: _____

Installer: _____

Date of Installation: _____