

Water Heater (Electric)



Equipment Description

An electric water heater uses electricity to create heat and raise water temperature for cooking, cleaning, bathing, and/or heating. Cold water enters the water heater tank at the bottom where two electric heating elements heat the water to a pre-set temperature. Heated water rises and is then drawn from the top portion of the tank and piped throughout the home for use.

Loss Scenario

Hot water heating elements commonly burn out. Energized heating elements protrude into the water tank and heat the water to a specified temperature. The impurities in the water cause scale buildup, corrosion and burnout. Top-heating element burnout can usually be identified when running hot water at a faucet and it only gets warm, but never gets hot. Similarly, lower heating element burnout can be identified when water from the faucet starts out hot, but quickly gets cold. If one of the heating elements fails, a professional service provider may be required to complete the element replacement.

If you have replaced one or both of the heating elements, and the problem persists, you may have a separate thermostat issue. The thermostat, usually located in the access panel on the side of the water heater, may need to be reset or replaced. If you decide to replace either of the elements or the thermostat yourself, refer to your owner's manual and make sure that the power to the water heater has been shut off before repairing.

Size and Carbon Footprint

Conventional electric water heaters can account for 14 percent to 25 percent of the energy consumed in your home. The typical household uses 30 to 140 gallons of hot water per day, and water heating tanks range from 20 to 80 gallons in size. A 40-gallon water heater can consume 4,500 kilowatt-hours (kWh) of electricity annually, resulting in production of 6,900 pounds of carbon dioxide (CO₂) emissions. The modern replacement for the conventional water heater is a tankless unit, which heats the water instantly when you turn on the faucet. This eliminates standby losses and saves energy.

Maintenance Tips

- A well insulated water heater will minimize energy waste. A tank that is warm to the touch needs additional insulation. Adding insulation around the tank and piping can reduce standby heat losses by 25 percent to 45 percent. This will save you around 4 percent to 9 percent in water heating costs.

- Sacrificial anodes, which are metal rods made of a material to prevent corrosion, will wear out over time. If they aren't replaced before they are worn, the tank will rust and eventually leak. Water softener systems can speed up anodes wearing out. Therefore, homeowners with water softener systems should check the water heater anodes every one to two years. Another option for heaters with softeners is a powered anode. This is a permanent replacement to the sacrificial anode and does not wear out and does not need to be replaced.

Loss Prevention Tips

- System water pressure greater than 80 pounds per square inch can damage the water heater, piping and appliances. If you have water pressure that high, consider installing a pressure reducing valve and an expansion tank. These will protect against damage from thermal expansion, particularly when nobody is using hot water.
- Don't set the thermostat above 130°F on electric water heater with an insulating jacket or blanket because the electrical wiring may overheat.