

# HEAT PUMP WATER HEATERS

## HPWH Technology

Many people will recognise the use of heat pump technology for heating and cooling their homes. But heat pump technology can be used to heat water.

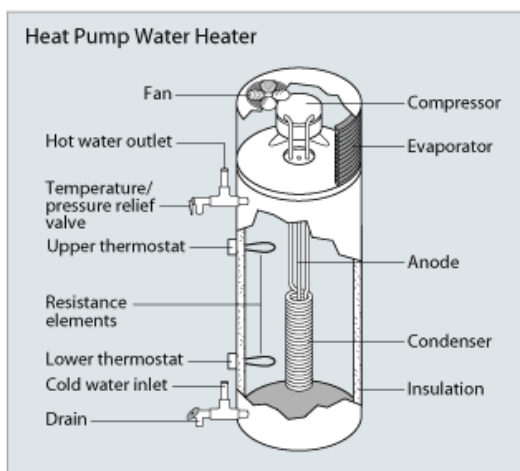
Heat pump water heaters <sup>1</sup> use electricity to move heat from one place to another instead of generating heat directly. Therefore, they can be two to three times more energy efficient than conventional electric resistance water heaters. To move the heat, heat pumps work like a refrigerator in reverse.

While a refrigerator pulls heat from inside a box and dumps it into the surrounding room, an air-source heat pump water heater pulls energy from the surrounding air and dumps it—at a higher temperature—into a tank to heat water.

You can purchase a heat pump water heating system as an integrated unit with a built-in water storage tank and back-up resistance heating elements. You can also retrofit a heat pump to work with an existing [conventional storage water heater](#).

You can also install an air-source heat pump system that combines heating, cooling, and water heating. These combination systems pull their heat indoors from the outdoor air in the winter and from the indoor air in the summer.

Because they remove heat from the air, any type of air-source heat pump system works more efficiently in a warm climate. They require installation in locations where the temperature is generally greater than about 4°C year-round and have at least approximately 28 cubic meters of air space around the water heater. Cool exhaust air can be exhausted to the room or outdoors. Install them in a space with excess heat. Heat pump water heaters will not operate efficiently in a cold space. They tend to cool the spaces they are in.



<sup>1</sup> Material edited from the US Department Energy “Consumers Guide Energy Efficiency and Renewable Energy”. [www.eere.energy.gov](http://www.eere.energy.gov)

## Selecting a Heat Pump Water Heater

Heat pump water heater systems typically have higher initial costs than conventional storage water heaters. However, they have lower operating costs, which can offset their higher purchase and installation prices.

Before buying a heat pump water heating system, you also need to consider the following;

- Tank size and amount of hot water used
- Energy efficiency (energy factor)
- Overall costs

The energy factor (EF) indicates a water heater's overall energy efficiency based on the amount of hot water produced per unit of fuel consumed over a typical day. This includes the following:

- Recovery efficiency – how efficiently the heat from the energy source is transferred to the water
- Standby losses – the percentage of heat loss per hour from the stored water compared to the heat content of the water (water heaters with storage tanks)
- Cycling losses – the loss of heat as the water circulates through a water heater tank, and/or inlet and outlet pipes.

The higher the energy factor, the more efficient the water heater. Product literature from a manufacturer usually provides a water heater model's energy factor.

## Installation and Maintenance

Installation of a HPWH is nearly as easy as installing a conventional water heater. However proper installation and maintenance of your heat pump water heating system can optimise its energy efficiency. Proper installation depends on many factors. These factors include climate, location within a building, building code requirements, and electrical safety issues. A registered plumber will be required to install your heat pump water heater.

Periodic water heater maintenance can significantly extend your water heater's life and minimize loss of efficiency. Read your owner's manual for specific maintenance recommendations.