

The Truth about Tankless Water Heaters

COURTESY OF THE COOPERATIVE RESEARCH NETWORK

Many of us have seen advertisements for tankless water heaters. The ads promise big savings. But are they accurate?

Unlike a traditional water heater, a tankless model does not store hot water. It heats water only as it is used. Either one or a series of heating elements within the water heater is activated when a hot water faucet or valve is opened. The unit heats the water as long as this is open. When it is closed, the tankless unit stops heating the water.

Companies that make tankless water heaters generally cite four advantages of their designs over a tank-type water heater:

- Unlimited (continuous) supply of hot water
- Instantaneous hot water if installed at point of use
- Reduced water-heating costs
- Small amount of space required for installation (usually wall-hung)

It is true that tankless water heaters do not require a lot of space. A large unit requires an area no larger than 24 inches square and extends from the wall by about 8 to 10 inches. But what about the other three claims?

Is It Realistic to Expect “Unlimited” Hot Water?

An unlimited supply of hot water may sound appealing, but it is not compatible with responsible water use, particularly in those areas of the country suffering from drought or chronic water shortages. Moreover, even the largest whole-house unit may not supply enough hot water for simultaneous multiple uses. Such a unit may be able to supply only two showers simultaneously, or perhaps one shower, a dishwasher, and a sink. If the users demand too much water, the temperature will



Interior Electric Tankless Water Heater

drop. So a tankless system probably won't meet the needs of a large family.

Water temperature rise is determined by the kilowatt capacity of the heating unit, the water flow, and the temperature of the incoming water. As the incoming water temperature drops, or as the volume of water moving through the heater increases, the temperature of the heated water will decrease correspondingly. The water temperature depends on the volume coming out of the faucet. If you turn on the faucet only enough for a trickle of water, it will be cold. If you open the faucet further, you will trigger hot water—the hottest you'll ever get. If you open the faucet to its maximum, the temperature will drop a bit. If you open more than one faucet, the water temperature should drop even more.

Your Home's Electric Service May Need to be Upgraded

Tankless electric water heaters usually require an upgrade in electrical service, something the home improvement stores often do not mention.

A tank water heater with 4,500-watt elements operates on #10 wire and a 30-amp circuit breaker. One whole-house tankless water heater has four 7,000-watt elements, for a total electrical load of 28,000 watts. This load requires wire and a circuit breaker that will handle at least 120 amps, at a cost many times that of electrical service to a conventional tank water heater. The load also will require a larger and more expensive meter loop and main panel for the house. In some cases, the customer also must pay for wiring between the neighborhood distribution transformer and the electric meter. You may need to check with a licensed electrician or your electric service provider to determine if your home needs to be upgraded.

Consumers who want to replace an existing conventional water heater with a tankless unit or add a tankless unit in a home-remodeling project will incur initial installation costs much greater than those for new home installations.

When a high amperage load comes on, voltage levels can be affected significantly. If a tankless water heater is installed in an existing home without upgrading the electrical service, low voltage or sudden voltage drops are likely to result in dimming or blinking lights and other problems. Some co-op customers complain about blinking lights after reportedly connecting 28-kW tankless units in homes with 150-amp services on 10-kW transformers.

Gas Tankless vs. Electric Tankless

Gas tankless water heaters generally do not require the same upgrades to a home's basic services as electric tankless water heaters.

However, the same considerations come into play when determining how many hot water faucets will be turned on at any given time and the distance of the tankless heater from the sinks and showers using the water.

It should be noted that gas tankless water heaters are Energy Star qualified and also may qualify for a 2009 federal tax credit. However, this Energy Star label does not mean that traditional electric water heaters are not efficient. To determine if a product meets Energy Star guidelines, the program looks at the product's potential to be improved. High-efficiency electric storage water heaters approach 100% efficiency and cannot be improved substantially.

Picking the Right Water Heater

Consumers looking for an efficient water heater should consider a heavily insulated traditional storage electric water heater. These water heaters are often the most cost-effective option over the product's life.

If you want to reduce your water heater energy costs, there are several avenues you can pursue. According to a report by Oak Ridge National Laboratory, measures such as tank insulation, temperature setback, timers, heat traps, and low-flow shower heads are more practical, much less expensive, and have a greater return on investment than installing a tankless water heater in an existing home with a conventional water heater.



Gas Tankless Water Heater

The Cooperative Research Network monitors, evaluates, and applies technologies that help electric cooperatives control costs, increase productivity, and enhance service to their consumers.

LEGAL NOTICE

This work contains findings that are general in nature. Readers are reminded to perform due diligence in applying these findings to their specific needs as it is not possible for NRECA to have sufficient understanding of any specific situation to ensure applicability of the findings in all cases.

Neither the authors nor NRECA assumes liability for how readers may use, interpret, or apply the information, analysis, templates, and guidance herein or with respect to the use of, or damages resulting from the use of, any information, apparatus, method, or process contained herein. In addition, the authors and NRECA make no warranty or representation that the use of these contents does not infringe on privately held rights.

This work product constitutes the intellectual property of NRECA and its suppliers, as the case may be, and contains Confidential Information. As such, this work product must be handled in accordance with the CRN Policy Statement on Confidential Information. Copyright © 2010 by the National Rural Electric Cooperative Association.