Using Recirculation Systems (Residential) with Noritz Tankless Water Heaters

What is a Recirculation System?

Recirculation is the process of keeping the hot water supply warm by circulating water with assistance of a pump through the water line back to the heat source. The pump can be controlled in various ways such as on an aquastat and/or timer or by a push of a button. Once the pump receives a signal to activate, it circulates cooled water that has been sitting in the hot water line and sends it back to the water heater through the cold water line or through a dedicated return line. When the water in the line reaches a desired set temperature, the aquastat cuts the electrical signal to the pump. When the hot water faucet is turned on, hot water is readily available within a few seconds.

- **Benefits** of having a recirculation system

  In a typical American home, anywhere from 7,000 up to 15,000 gallons of water per year are wasted by homeowners waiting for hot water to reach bathroom and kitchen fixtures (Fig 1). This problem has gotten worse as homes have gotten bigger and water-pipe diameters have increased. When continuous-recirculation systems are installed to provide instant hot water (an increasingly common practice), water waste is eliminated, but the energy penalty is very great.

Fig. 1

- Get your hot water faster
- Save water
- Save energy
- Improve the performance of your dishwasher: the number one cause of poor dishwasher performance is water that is not hot enough on the first cycle.
- Reduced sewage output
- Reduce greenhouse gas emissions

Types of Recirculation Systems

- **Dedicated Recirculation System**
  This system is usually found at new residential constructions or commercial applications. According to the Plumbing Code (UPC), whenever you have a closed loop system, like a

dedicated recirculation system, you must install check valves to prevent backflow and an expansion tank to allow the hot water to expand and protect the plumbing system (Fig 2).

For Residential model series, NR83, NRC83, NR98, NRC98, NRC111, or NR111, installed after September 1, 2010, the heat exchanger warranty (12 years) will remained unaffected if the product is used in a single family dwelling in conjunction with a controlled recirculation system installed in accordance with the Installation Manual.

For all other residential model series and product installed before September 1, 2010, this type of recirculation system reduces the warranty in our residential heaters from 12 to 3 years.

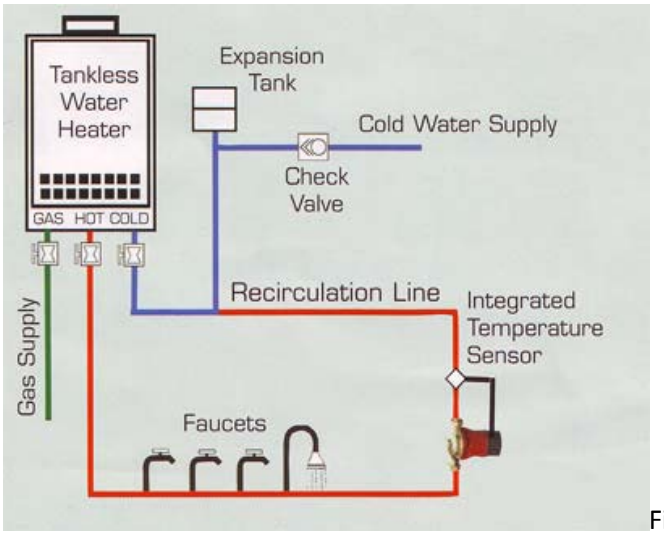


Fig. 2

- **Retrofit Recirculation System**
  This type of recirculation system is seen whenever the home was not planned to have a dedicated recirculation line, and due to cost and inconvenience, it makes more sense to install one of these types of recirculation systems (Fig. 3).
  This type of recirculation system will reduce the warranty as well, unless a D'MAND system s used.

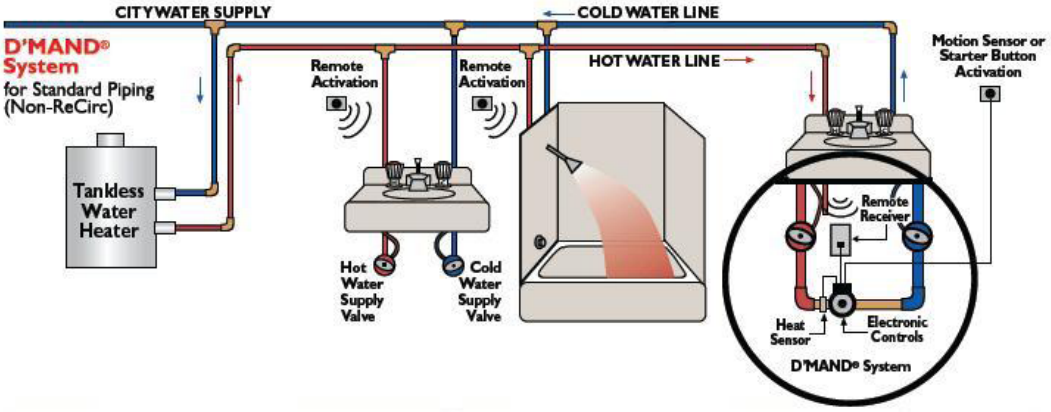


Fig. 3

Noritz Tankless Water Heaters and Recirculation Systems

- **Dedicated recirculation systems (Fig. 4).**
  When selecting a pump for the application, make sure the pump is able to flow around 1.5 – 2.0 gpm through the system and that it can overcome 10ft of head loss (from the heater) + piping loses. We recommend contacting a pump manufacturer for assistance in selecting the proper pump for your home. Some pump manufacturers who specialize in recirculation pumps are Grundfos, Taco, and Laing. If the pump is pushing too much water through the system, the installation of a globe valve is recommended. This will throttle down the flow, preventing the heater from unnecessary wear and premature failure.

  Noritz requires that the pump is controlled by an aquastat. In addition, a timer is recommended, so the pump only activates during the peak hot water usage hours. The aquastat should be set 10°F to 15°F lower than the temperature set of the heater, with a differential of 5° to 10°.

  The use of a buffer tank to alleviate a "cold water sandwich" is optional. Please contact Noritz Technical Support with any further additional questions.

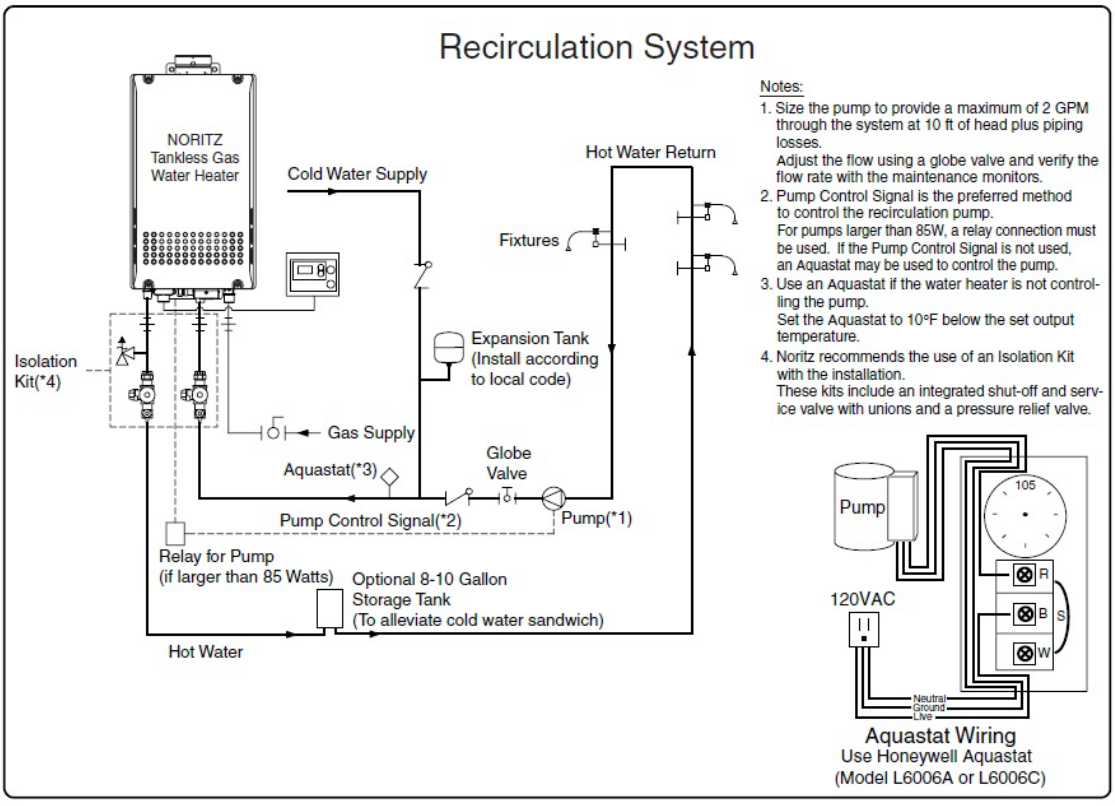
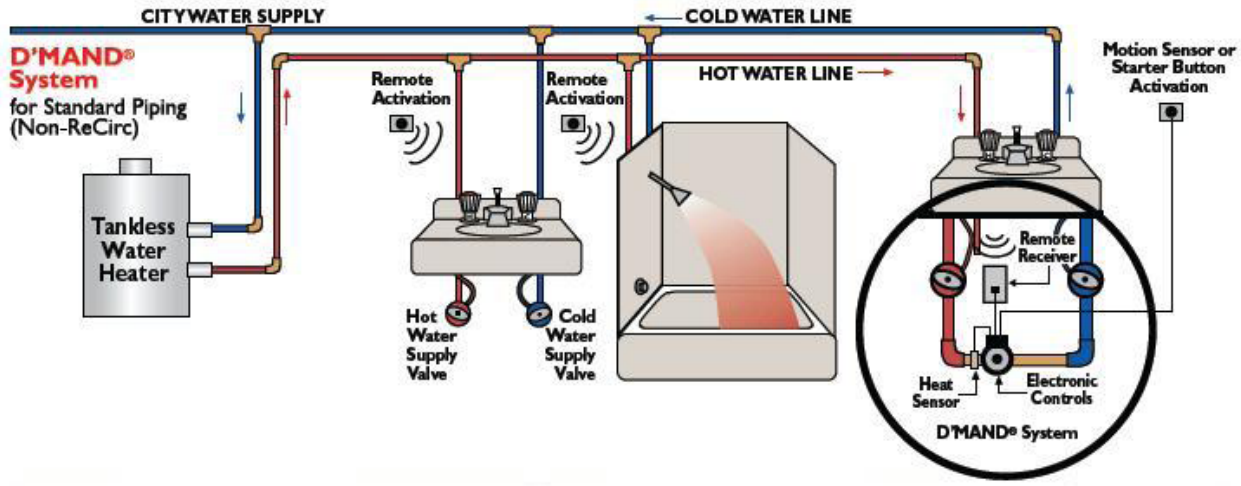


Fig. 4

On Demand Recirculation Systems

What is an On Demand recirculation system?

An On Demand system consists of a pump that is installed underneath the fixture farthest from the hot water heater and activated as needed by the end-user. Using the **Metlund D'mand** (www.gothotwater.com) recirculation system **DOES NOT** affect the warranty in our Hot Water Heaters.



How it works

These systems all work on the same principle: an electronically activated water-pumping system quickly delivers hot water to a fixture, while returning water that has been sitting in the hot-water pipes back to the hot-water heater via the cold-water supply pipe. The On Demand pump is activated by pushing a button near the fixture, or by remote control, and it switches off when hot water reaches a temperature sensor at the fixture. Because the water flow in the pipe is regulated by the pump rather than by the delivery rate of the faucet or showerhead, hot water is delivered very quickly--usually within 15 seconds. Contact the manufacturer for the most up to date pricing.