



TECHNICAL BULLETIN: RECIRCULATION PUMPS

A recirculation pump may be used in residential hot water systems to help conserve water and to reduce hot water wait times at the taps - particularly in homes with long piping runs.

While these pumps offer extra comfort and convenience, they must be programmed properly to avoid higher energy consumption, reduced hot water capacity, and overall reduced water heater performance.

Cala's predictive controls and preheating capabilities will incorporate the hot water used by the recirculation pump if it is installed according to the guidelines below. These controls learn each home's hot water usage patterns via a built-in flow sensor and optimize water heating to ensure ample hot water during periods of peak demand while also minimizing energy use. If needed, Cala will preheat water to a higher tank temperature to increase capacity ahead of high demand; the factory-installed mixing valve ensures the home always gets safe temperatures at the taps.

Failure to follow these guidelines may impact hot water capacity, energy use, operating costs, and/or reduce the life of the water heater!

- The pump must be installed in accordance with local codes, the manufacturer's instructions, and Cala's guidelines below. If doing so is not possible, please consider a different pump or avoid installing the recirculation system.
- **The recirculation loop must be installed so that it returns water to the cold water inlet. DO NOT install the return loop to the drain valve.** Returning to the cold water inlet enables Cala to collect flow data from the pump which feeds into our water usage prediction system. Refer to the diagram on the following page.
- **All piping in the hot water supply and recirculation loop must be well insulated**, ideally with an R-value of at least R-4, or up to R-7 in colder climates.
- Piping diameter must be between ½" to ¾" diameter.
- We recommend that the homeowner or installer enter information about the recirculation pump into the Cala app in the System Integration menu. This will maximize the effectiveness of Cala's remote monitoring capabilities.



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SUMMARY

Mode	Description	Energy Use	Comfort	Works with Cala?
On-Demand	Pump is manually triggered via a button or remote. Short wait time may still occur.	Low	Med	Yes
Timer-Based	Pump runs on a timer, typically in 15 minute increments*	Low	Med/High	<p>Yes, with best performance if the following conditions are met:</p> <p>The pump is run on a staggered schedule rather than on a fixed hourly schedule; a few times daily is often enough for most homes:</p> <p>DO run the pump before periods of typical heavy use (morning and/or evening showers/baths).</p> <p>DO run the pump for no more than 15 minutes* at a time, approximately 15-30 minutes before expected usage.</p> <p>DO NOT run the pump hourly.</p> <p>DO NOT run the pump overnight or during the day if little use is expected.</p>
Aquastat/ Temperature-Based WITH TIMER	During specific, programmed times, a temperature sensor triggers the pump when the water line temp drops below a certain threshold.	Low/ Med	Med/High	<p>Yes, with best performance if the following condition is met:</p> <p>Programming similar to Timer-Based above.</p>
Self-Learning	The pump automatically adjusts when it runs based on your typical hot water usage patterns	Low	Med/High	Yes
Aquastat/ Temperature-Based WITHOUT TIMER	A temperature sensor triggers the pump when the water line temp drops below a certain threshold.	High	High	No
Continuous	Pump runs continuously.	High	High	No

*Most pump timers have a minimum increment of 15 minutes, but we recommend using the smallest increment available on the model. Alternatively, the pump can be paired with a smart plug and programmed manually.