

A recirculation loop is sometimes added to residential hot water systems to reduce the time it takes for hot water to reach distant fixtures. This setup typically involves a small return pipe and an inline pump, which moves hot water from the far end of the plumbing system back to the water heater. Depending on how the system is controlled, the pump may operate intermittently or continuously.

While recirculation systems improve user comfort and reduce water waste at the tap, they can introduce challenges when paired with heat pump water heaters (HPWHs). In a recirculation system, warm water returning to the tank may not trigger a heating cycle in the same way cold inlet water would. This can lead to reduced heating response or inconsistent water temperatures, especially when the unit is set to energy-saving modes.

Additionally, hot water circulating through the pipes can result in significant heat loss, especially if the piping is not well insulated. This added heat loss can increase energy consumption, as the water heater must operate more frequently to maintain the set temperature.

For these reasons, continuous recirculation is generally not recommended. However, if a recirculation loop is necessary, the following guidelines can help maintain system performance:

- Use a temperature-controlled sensor to operate the pump only when needed rather than on a fixed timer.
- Set the water heater temperature 5–10°F higher than the desired outlet temperature to compensate for pipe heat loss.
- Use Turbo Mode to ensure faster recovery during circulation.
- Insulate all hot water piping in the loop to minimize energy loss.

System design, usage patterns, and control settings can all influence performance. If a recirculation pump is used, it should be installed with careful attention to these factors to ensure compatibility with heat pump water heater operation.