CircuitSolver®
A ThermOmegaTech® brand

BALANCING RETURN WITH CIRCUITSOLVER®

RECIRCULATING DHWS RETURN LINE TO WATER HEATER

THE PROBLEM

During periods of no use, domestic hot water recirculation systems function as a closed loop. The mixing valve will utilize the water from only the return line and water heater since no additional cold water can enter the system. When an excess of return flow is directed to the water heater, the system's water temperature will gradually rise until it equals the storage tank temperature. Conversely, if too much return flow is directed to the mixing valve, the temperature throughout the system will decrease to ambient temperature.

TRADITIONAL SOLUTION

Conventionally the way to solve this issue involves installing a manual balancing valve between the water heater and the return flow into the water heater. However, the flow requirement is typically set based on estimation rather than automatic adjustment to accommodate the evolving dynamics of a recirculating hot water system. Consequently, this design can result in gradual temperature increases or decreases over time. ater system.

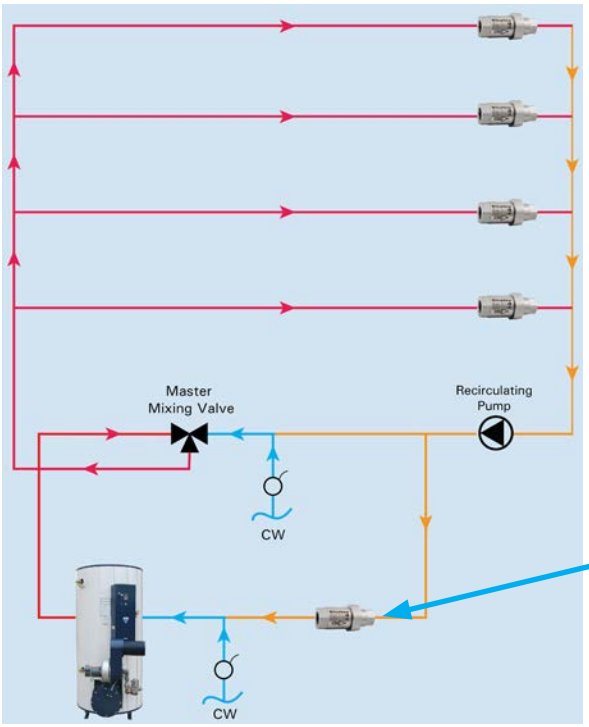
THERMOSTATIC SOLUTION

A more effective approach is to use a thermostatic valve, CircuitSolver®, in place of the manual balancing valve. The set-point of the CircuitSolver® should match the desired return temperature. When installed on the supply inlet of the return piping to the water heater, the CircuitSolver® will regulate the flow of water back to the water heater in proportion to how cool the return water temperature is relative to the mixing valve output temperature.

When the water temperature at the return valve equals the desired return temperature, the CircuitSolver® would be closed, except for a small bypass, allowing minimal flow back to the water heater. However, as the return water temperature drops below the desired temperature, the CircuitSolver® opens, providing increased flow to the water heater. This effectively mitigates both positive and negative temperature creep.

CircuitSolver® valves will ensure that significant temperature variations, either higher or lower than the mixing valve output temperature, are avoided. It is a temperature solution to a temperature problem.

EXAMPLE:



The master mixing valve output temperature is 125°F with a desired return temperature of 115°F, 10°F ΔT.

The set-point of the CircuitSolver® in the return line to water heater should be the same as the CircuitSolvers at the end of each branch/riser.

CircuitSolver® Selection

- Select the set-point temperature equal to the desired return temperature.
- Select the size of the CircuitSolver® equivalent to the return to the water heater line size.
- Choose applicable options – union, check valve, ball valves, Viega ProPress® or Uponor ProPEX® fittings, etc.
- Build the appropriate model number based on these selections.

CircuitSolver®: Match line size with the return lines going back to the water heater and the temperature set-point with desired return temperature.

Contact ThermOmegaTech® regarding any application questions.