

BALANCING RETURN WITH CIRCUITSOLVER[®]

RECIRCULATING DHWS RETURN LINE TO WATER HEATER

THE PROBLEM

In periods of no use domestic hot water recirculation systems act 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.

If too much of the return flow is directed to the water heater, the water temperature throughout the system will gradually increase until it matches the storage tank temperature. Inversely, if too much of the return flow is directed to the mixing valve, the temperature throughout the system will drop to ambient temperature.

TRADITIONAL SOLUTION

Conventionally the way to solve this issue is by installing a manual balancing valve between the water heater and the return flow into the water heater. The flow requirement set is a “guesstimate” and cannot automatically adjust with the changing dynamics of a recirculating DHWS. This results in a temperature creep up or down over time.

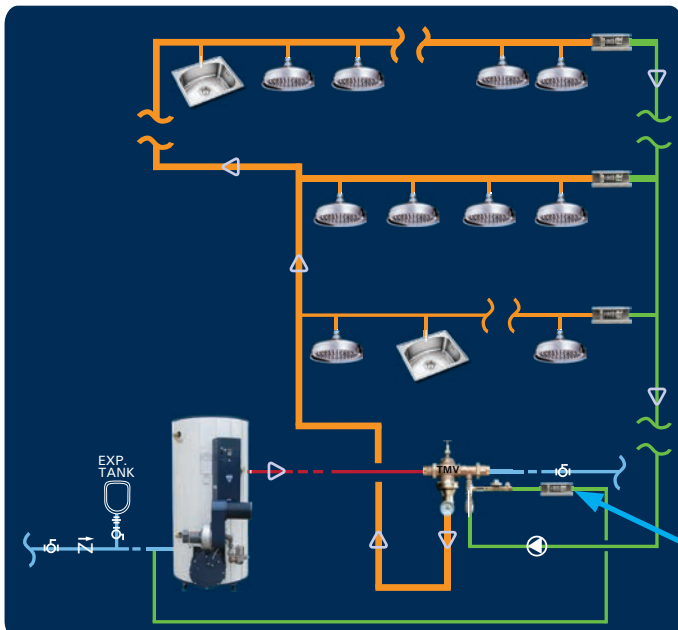
THERMOSTATIC SOLUTION

A better approach is to use a thermostatic valve, CircuitSolver[®], in place of the manual balancing valve. The CircuitSolver[®] set-point should equal the desired return temperature. When installed on the supply inlet of the return piping to the water heater (see diagram below) CircuitSolver[®] will flow 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, providing minimal flow back to the water heater. As the return water temperature falls below the desired temperature the CircuitSolver[®] will open, providing increased flow to the water heater effectively minimizing both positive and negative temperature creep.

This temperature device addresses a temperature problem and will ensure that there is no significant temperature creep either higher or lower than the mixing valve output temperature.

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[®] ends, 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 specific application questions.