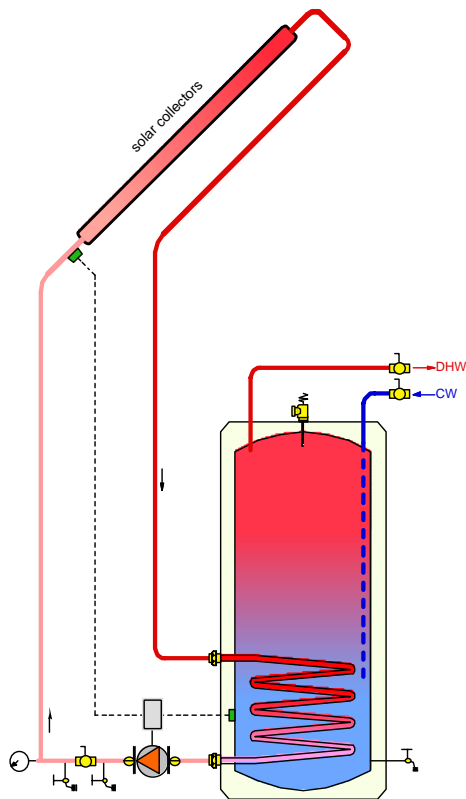


So You Want To Go Solar

The Glitch

Overview: Given all the recent interest in solar domestic water heating, Joe Wrenchturner decides to have a go at it. He orders some goodies through the Internet store Solar-Is-Us and installs them according to the schematic below.

Exercise: Can you spot a few “minor” details that should be changed before the sun shines on this installation?



The Fix

1. All closed-loop piping circuits with a heat source must contain a pressure relief valve and an expansion tank. Without them, you're going to have a mess when the weakest piping component in the circuit lets go with superheated glycol ready to blast out.
2. The collector circuit must include a check valve to prevent nocturnal cooling caused by cool glycol in the collectors descending down the supply pipe as warm glycol from the heat exchanger rises up the return. Trust me, this can dump an entire tank's worth of heat back to the atmosphere in a few short hours.

Note the check valve has been mounted between a pair of purging valves in the Fix schematic. Add glycol solution to the circuit using the left-side valve and remove purging flow through the right-side valve. The differential pressure associated with purging keeps the swing check backseated and eliminated the need of installing a ball valve.

3. The PONPC (Point Of No Pressure Change) still applies in solar circuits. Mount the circulator to pump away from the expansion tank location.
4. Although the Glitch system may operate, it's not going to perform well with the collector temperature sensor mounted on the inlet rather than the outlet of the collector. This sensor should be as close as possible to the collector outlet. Mount it tight, and be sure it's wrapped with insulation.

Also, be sure that no moisture can get into the wiring splice between the collector sensor and the cable back to the controller. Moisture leads to corrosion, corrosion leads to resistance change, and resistance change in a thermistor sensor circuit leads to inaccurate temperature information and poor control.

5. NEVER, NEVER, NEVER install a solar domestic water heating system without an anti-scald rated thermostatic tempering valve between it and the plumbing fixtures.
6. I would recommend a microbubble air separator in the collector circuit, and generously size the expansion tank to accommodate a bit of extra glycol solution to make up for eventual air elimination.
7. Put a good-quality float-type air vent — one that's rated for "solar duty" — at the top of the system. Set it on top of a ball valve that can be closed after the system is deaerated. The latter protects the vent mechanism from potentially high temperatures (think 350°F+) when the collectors stagnate. It also allows for easy servicing of the vent if needed.

