

The Glitch & The Fix, December 2012

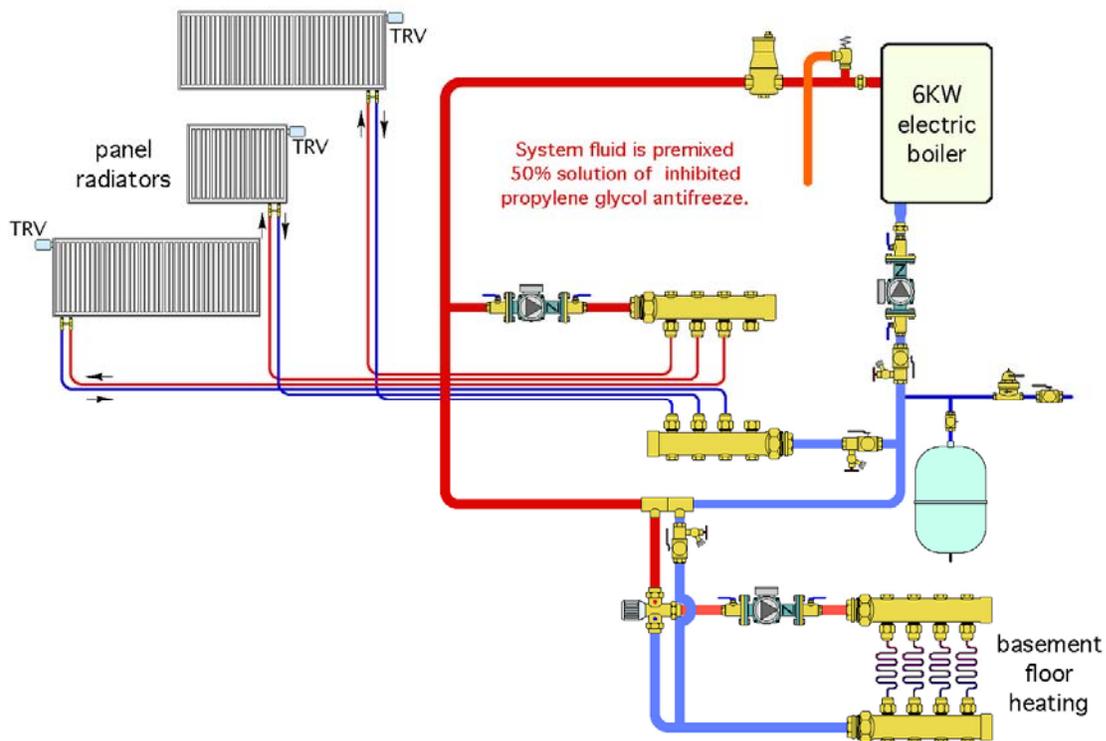
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Hit or miss

The Glitch

An installer assembles a small hydronic heating system, as shown below, for a well-insulated home. The basement has a heated floor slab. The first floor is heated by panel radiators. At times all is well with the system. However, at other times, when the basement slab is first calling for heat, the panel radiators only get luke warm.

What's going on, and how would you fix it? While you're at it, are there a few other details that are incorrect?



The Fix

The key problem was described in last month's hydronics workshop column, "Thermal depression." In summary, the slab, when allowed to cool a few degrees below its normal operating temperature and then turned back on, can absorb heat into itself faster than the boiler can produce heat. This depresses the water temperature in the entire system.

The fix drawing is shown below. The following changes have been made:

1. The three-way thermostatic mixing valve has been replaced with a three-way motorized mixing valve. The latter can now monitor the water temperature coming from the boiler. When necessary, the three-way motorized mixing valve can reduce hot water flow into its hot port, and thus avoid the thermal depression problem.
2. Both heating subsystems have been attached to the boiler loop using closely spaced tees. This eliminates the interference between the circulator supplying the panel radiators and the boiler loop circulator.
3. Because the system is filled with a 50% antifreeze solution, the makeup water system has been removed and replaced by a fill / purging valve.
4. The purging valve on the subsystem serving the floor circuits has been oriented so that its drain port can properly release air from the secondary circuit when it is purged.

