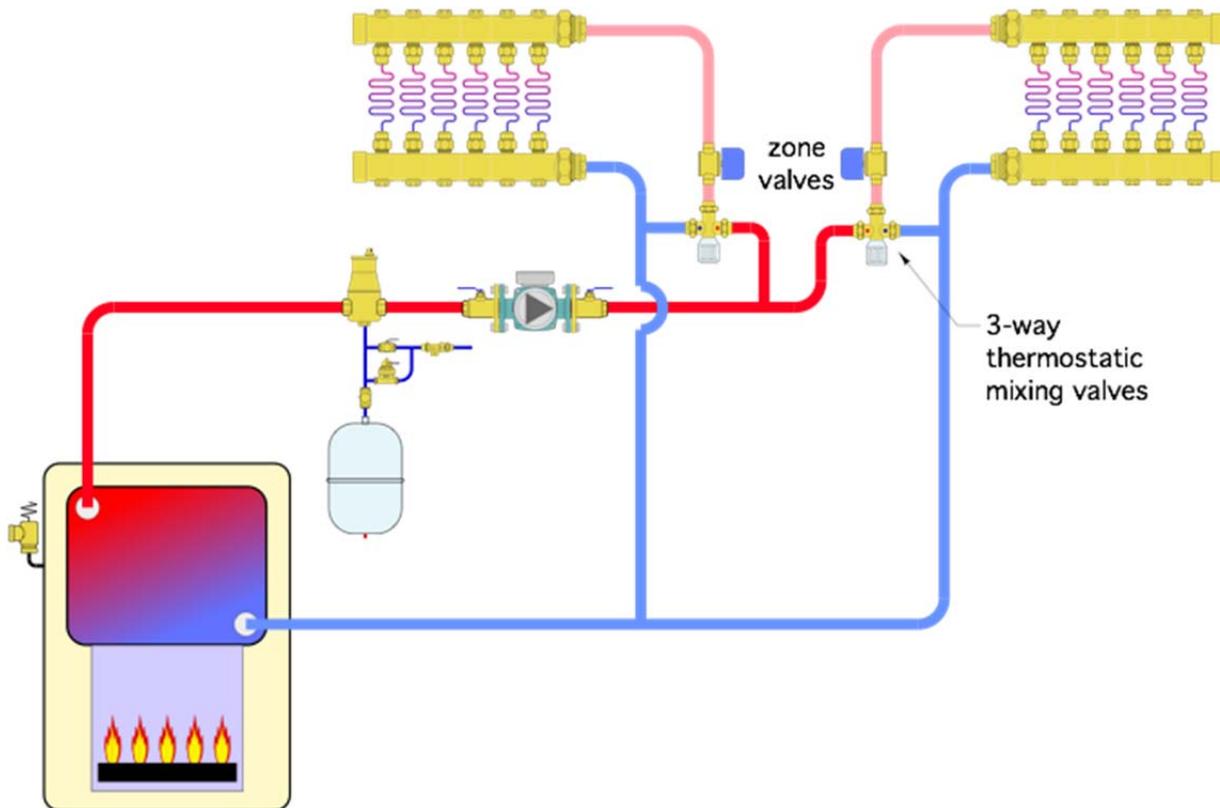


Taking the Easy Path...

The Glitch:

An installer pipes up a 2-zone low-temperature radiant floor heating system to a conventional gas-fired boiler as shown in Figure 1. Zone valves are installed so that each zone can operate independently. Can you identify at least 4 errors in this design?



2. There is nothing to prevent sustained flue gas condensation from forming within the conventional boiler. There are several ways to fix this, each of which measures the water temperature entering the boiler and reacts to it. One of the simplest approach is to install a high flow capacity 3-way thermostatic mixing valve as shown in figure 2. This valve will always modulate in an attempt to keep the boiler inlet temperature at or above 130 °F, which is generally high enough to prevent sustained flue gas condensation.

3. Because each of the manifold stations now has its own circulator, each can operate as a separate zone. However, this requires preventing of flow reversal through the inactive zone when the other zone is operating. A 3-way thermostatic valve cannot provide flow reversal protection, because under certain conditions flow can move directly between the hot and cold ports of the valve. This potential flow short circuiting also prevents a spring-loaded check valve within each of the new circulators from ensuring there is no flow reversal. The solution is to install a spring-loaded check valve near the end of each branch circuit. Provide at least 12 pipe diameters of straight pipe upstream of this check valve to minimize turbulence and possible rattling of the valve's internal disc.

4. Finally, the system in figure 1 lack any means of forced-water purging. Two purging valves, one in each branch circuit, have been installed in the system of figure 2 to handle this task.

J.S.