

## March 2013 The Glitch & The Fix

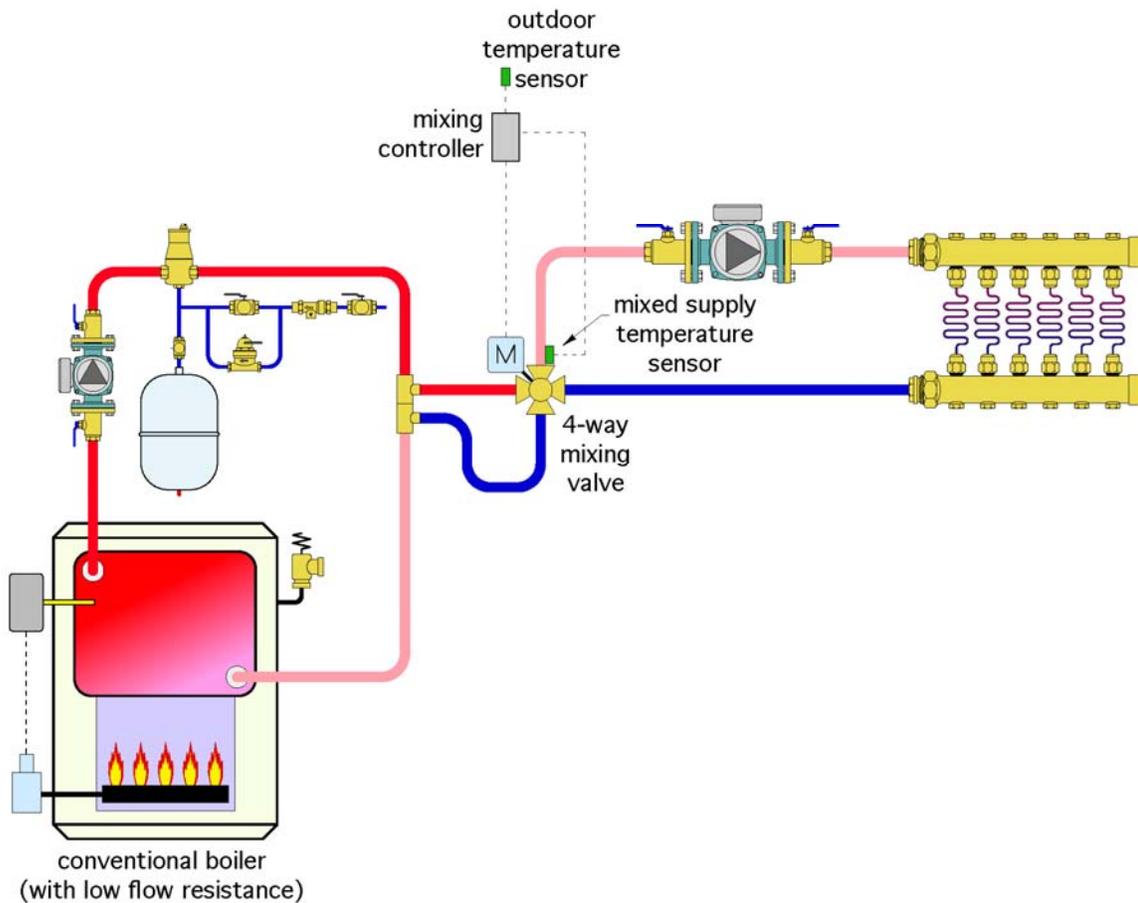
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# Overpowered

## The Glitch

An installer decides to use a four-way motorized mixing valve to interface between a gas-fired, cast-iron boiler and a low-temperature radiant panel system. The system is installed as shown. The mixing valve is located close to the boiler.

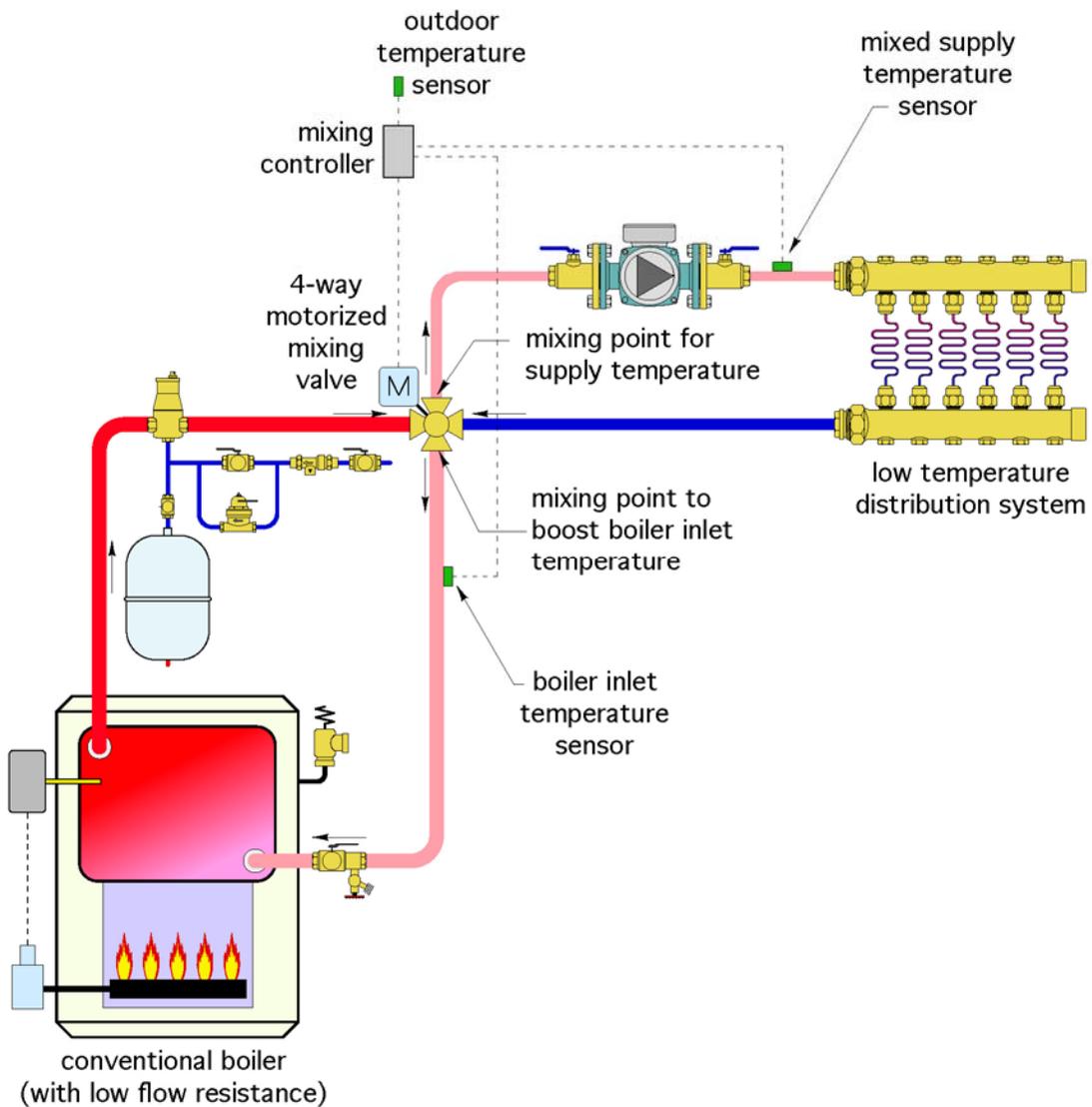
Can you spot at least four details that are either missing, incorrect or unnecessary for this type of system?



## The Fix

A four-way motorized mixing valve is specifically design to create two mixing points within itself: One to regulate system supply temperature and the other to boost boiler inlet temperature high enough to prevent sustained flue gas condensation.

To accomplish the latter, the controller operating the valve's motor must sense and react to boiler inlet temperature. Thus, a boiler inlet temperature sensor is required.



It's also unnecessary to use a separate boiler loop and its associated circulator when the boiler has low flow resistance and the mixing valve is located close to the boiler. With generously sized piping between the boiler and four-way valve, sufficient flow is created from the combined effects of buoyancy and momentum exchange in the mixing valve.

Elimination of the boiler circulator reduces both installation and operating cost. Several hundred dollars in operating expense can be saved over the life of the system simply by eliminating one small circulator.

Note that the supply temperature sensor is located immediately downstream of the four-way mixing valve. Although mixing may have begun by the time flow passes this sensor location, it may not be complete and, thus, the sensor may not be sensing the final blended temperature sensor to the radiant panel circuits. It's always good practice to install the supply temperature sensor downstream of the distribution circulator to ensure complete mixing has occurred before flow passes by the sensor.

Although the boiler loop circulator was eliminated in the redesign, its original placement shows it pumping toward, rather than away from, the tap in location of the expansion tank. This is always something to avoid.

Another important detail is the addition of a purging valve upstream of the boiler inlet.