

Answer to question from Tech Talk No. 20 – low gas pressure could also have also caused the boiler to under-fire.

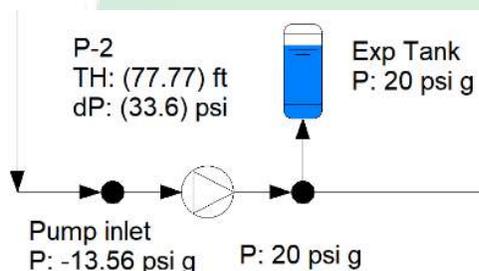
One of the fundamental principles of closed hydronic systems is the pressure at the expansion tank connection, commonly referred to as the ‘*point of no pressure change (PNPC)*’, cannot be changed by running a pump. This story is about how violating this principle caused a lot of trouble. It’s also a continuation on the theme about jumping to conclusions.

I was at a rep event doing a seminar on hydronic system topics. To my surprise, one of the fellows in the audience got animated when I mentioned glycol and offered up his opinion on glycol solutions, which was that they were the work of the devil.

Rather than derail the presentation, I asked him if we could sit down for a coffee at the next break. We did and he told me the rest of the story. His new building with a water-source heat pump system had air problems from day one. To try and get rid of the air, they had installed automatic air vents all over the system and glycol was leaking from every one of them. A lot of ceiling tiles had been ruined and they had gone through a lot of glycol. I didn’t believe that any of this was the fault of the glycol.

I asked him if they had an air separator, he said yes; in fact, the air vent on top of the air separator was always foaming. When he said that, a light went on in my head. I had some free time the next morning and offered to visit the building to check it out. He readily accepted.

On site, we found the expansion tank was connected on the discharge side of the pump as shown



in the schematic to the left. (I built a small model in Pipe-Flo to illustrate). Specified pump head was $\approx 75'$ (≈ 33 psid). The fill pressure at the tank was ≈ 20 psig. Unable to change the pressure at its discharge, the pump had dropped the pressure at the pump inlet (and air separator) to below atmospheric. The pressure gauge on the pump inlet was pinned at zero and the air vent on the

separator was sucking air into the system rather than letting it out.

All they had to do was move the expansion tank connection point to the inlet of the pump. Then, remove or valve off all the auto air vents they had installed.

I have often been amazed at how problems are laid at the feet of the ‘new kid on the block’, which in this case was their first use of glycol. It wasn’t an experiment; there are tens of thousands of HVAC systems that run fine with glycol, not to mention millions of cars, trucks, etc.

Some critical thinking would have concluded that it was not logical for the glycol to be the problem and start looking for another cause.