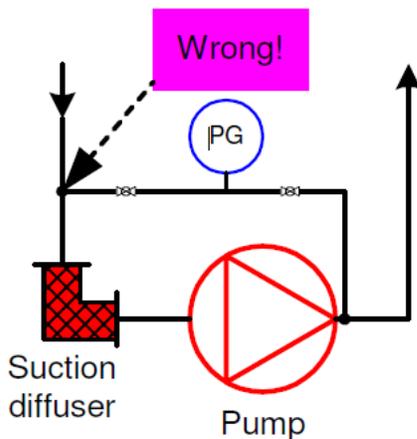


I've had to deal with a lot of issues that developed from bad assumptions. This one started when an engineering client asked me if I had ever had an issue with automatic flow limiters overflowing. This was code for saying he had (or thought he had) exactly that problem on a job. I will admit that his assumption that the flow limiters were the problem irritated me; it could have been any number of things. I said I would check it out, mostly in the hope that he would be proven wrong.

The overflow claim was made by the balancer based on a pressure gauge reading of the pump head with all control valves open. This is a good way to get a *guesstimate* of the flow, but it has limitations. One thing to note is that curves published by the manufacturers are based on testing a generic pump, not the pump on the floor in front of you. There can be differences from pump to pump, e.g. casting imperfections. For accuracy you would need to get your specific pump tested to produce what's called a 'certified' curve, and that's rare in HVAC because of the cost.



When I arrived on site, I noticed that the piping for the gauge used to measure the pump head was wrong. The inlet side was not connected to the pump inlet flange, but to the piping upstream of the suction diffuser/strainer*. This meant that the differential reading was the pump head *less* the head loss through the suction diffuser. As we all know by now (Tech Talk #2), *low head at the pump means high flow*.

The pump in question had a flat curve, so a few feet of head difference meant a big increase in flow. The assumption made by the balancer and accepted by the engineer was based on bad information.

The plumbers were still on site so I asked one of them to change the gauge piping. That done, we checked the pump head, referenced the generic curve, and came up with a flow rate close to spec, certainly within the +/- range of the flow limiters.

**A second valved line from the gauge inlet to the pump inlet would allow checking the differential pressure across both the pump and the suction diffuser/strainer. This is the preferred way to do it.*