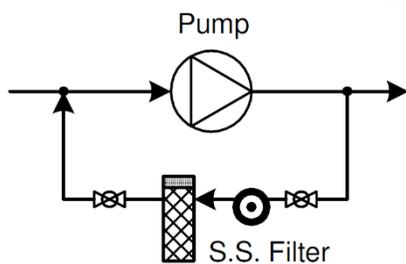


Ah, the humble side-stream filter. There are thousands of these operating in all kinds of hydronic systems; operating like our kidneys to remove impurities and keep the fluid healthy. I've always found it interesting nobody knows the flow rate in almost all of the side stream installations.

How much flow *should* be going through these filters? There are various recommendations, generally in the range of 5-10% of the pump flow. If you want to know how long it will take to get all the fluid filtered, you'll also need to know the system volume. The filter flow rate is produced by the pumps and it is flow *that is not available to the system*. It just goes through the filter and right back to the pump, so avoiding overflow is a good idea.



Let's consider the hydraulics. The filter is always located directly across the pump(s) and sees the full amount of pump head, so it's necessary to throttle the filter circuit to prevent overflow. And how do we do that? We throttle what is usually a ball valve, which is not a balancing valve, until we get what we believe is just the right amount of movement of the ball in the sight glass. In other words, not accurately at all. I've seen lots of those valves barely cracked open.

Now I have a question for you. If the system is variable flow (and most systems are) should the filter flow rate be constant regardless of system flow? How can that be achieved when the pump head is variable? If we throttle the filter circuit for design pump head, what will happen when the pump head is lower? Or even, in the case of a constant speed pump, possibly higher? It's obvious that the filter flow rate will change, even with a proper manual balancing valve in the circuit instead of a brainless ball valve. Another curveball is that the filter pressure drop will increase as the filter loads up, which will also change the flow rate.

If we decide that we want a consistent filtration flow rate because the system volume is constant even though the system flow rate and filter pressure drop are changing, there is only one practical solution. Put an automatic flow limiter in the side-stream filter circuit. Decide what flow is required, pick a flow limiter to match, and it will work to maintain a constant filtration rate in the face of variable pump head and filter pressure drop, or even the higher pressure drop of a more efficient filter cartridge.

I sold automatic flow limiters for years and think this is a great application for them. One more thing consistently right in any hydronic system (to quote Martha Stewart) is always a good thing.