

HCS Brief

Hydraulic Cartridge Systems

Tech Brief TB-0006

Proportional Valve Stability

On any proportional valve system, air is a problem if it gets trapped in the valve. In the case of the pilot operated valves, it can take a while to get the air out. Higher flows tend to help push out the air trapped behind the spool. If you can run to a higher flow, it will then work well at the lower flows.

Position of the valve is important. It is best not to have the valve at the high point of the system. This traps air. It is best to have the valve mounted horizontally so the tube is off to the side. This limits the amount of air that can be trapped. If the tube is straight up, you won't get the air out.

The tube should also not be at the lowest point in the system and the tube should not be pointed down. In that case, the valve acts like a trap for contaminant to be trapped in the tube. The other benefit to have the tube horizontal is that any G load acting on the valve will not tend to self-activate the valve. Some systems see about 3 to 5 G loads but some go as high as 10 G.

The tank side of the proportional valve should be vented higher than the valve. This keeps the oil in the valve when the system is shut down. On many systems, we have used a check valve in the tank line to help with this. We have seen this help with stability in several cases.

We call out a specific PWM frequency to use on the products. Some may not be following this and could be using IQAN or something similar. We do not have any test results using this type of system. The dither frequency and amplitude are different from each manufacturer. The drivers typically are anywhere from 1KHz to 10KHz.

The above information will allow for the best possible operation of the Parker HCS Proportional Valve product line to ensure optimal performance in your application.



More Information

Parker Proportional Valves are available from the Hydraulic Cartridge Systems Division. Consult your HCS catalog or www.parker.com/hcs for more information. You can also contact a Product Manager or Technical Support Specialist for help at 847-955-5000 or HCSTechnical@parker.com.