

## LOW VOLUME TEE FITTING FOR INSTRUMENT ASSEMBLIES

PIP #: DS-PI-100

Applicable to:  
Diaphragm Seal  
and Isolation  
Ring Assemblies

When attaching multiple instruments to a single diaphragm seal or isolation ring, Ashcroft engineers have optimized assemblies to provide the most robust and accurate instrumentation possible. To do so, assemblies are designed to minimize:

- Potential leak paths
- Overall weight of the assembly, with special attention to load-bearing points on an assembly
- The effects of pulsation, vibration, temperature fluctuations and everyday use
- Internal fill volume

To that end, Ashcroft provides instruments mounted on a “tee” fitting (see figure 1), rather than in a goal-post orientation. Doing so allows for weight to be better centered over the diaphragm seal connection port, minimizing the chances of damage during shipping or at a customer’s site. It also requires significantly less fill fluid to operate, improving an assembly’s thermal error.



Figure 1 Instrument Assembly with “tee” fitting

To further improve the performance of these assemblies, Ashcroft has introduced new low volume fittings (see figure 2) for use in multiple-instrument assemblies. By minimizing the amount of pressure transmitting fluid inside of a seal assembly, the effect of temperature fluctuations on an assembly with multiple instruments is greatly reduced when compared to a goal post orientation (see figure 3).

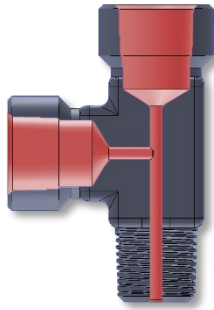


Figure 2 Low volume tee fitting

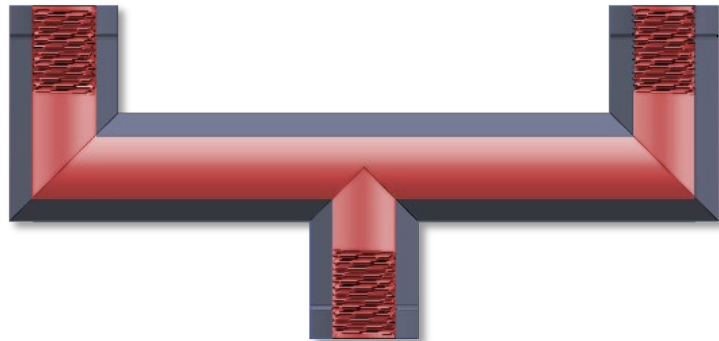


Figure 3 Goal post fitting

Switch set points are particularly susceptible to drift with changes in ambient temperature. Figure 4 below shows the effect of changing temperatures on the set point of an Ashcroft B-series switch when assembled to a 4" isolation ring with both a low-volume fitting and a goal-post fitting.

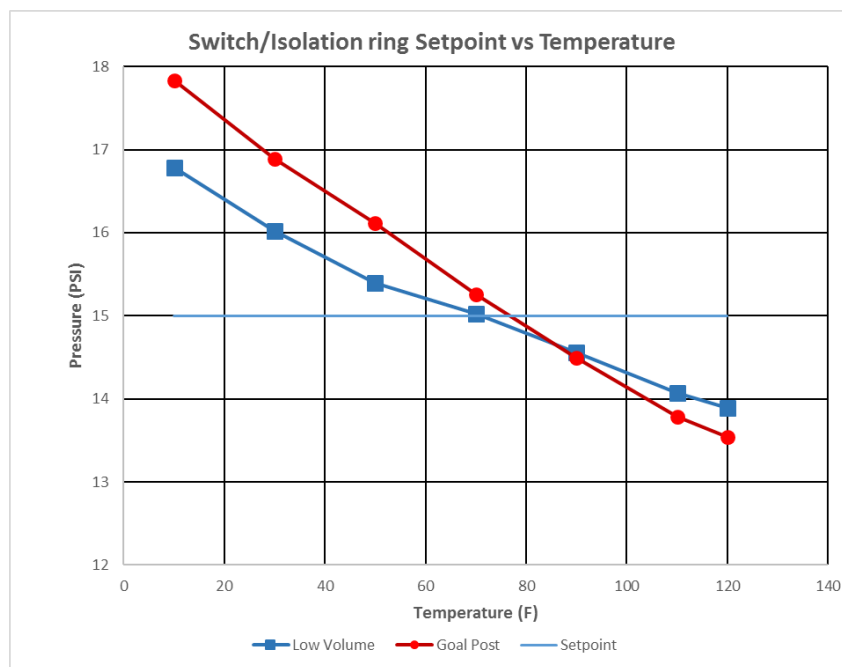


Figure 4- Switch/Isolation Ring Set Point vs Temperature

The red line (goal post fitting) shows a shift of about 0.39 psi per 10°F change in temperature, while the blue line shifts about 0.25 psi per 10°F, a 35% improvement. These changes may not seem like much, but when pumping equipment relies on pressure switches to prevent damaging or potentially unsafe process conditions, minimizing temperature error becomes critical.