



Product	Pivot Seal Pressure Switch
Application	Diaphragm Rupture Detection in Chemical Injection Skids
Industry	Oil & Gas

Challenge In crude oil storage and transportation, various chemicals such as demulsifiers, corrosion inhibitors, and oxygen scavengers are injected into the pipelines at precise flow rates, mostly against high line pressures, to achieve certain desired results. The pumps used are Positive Displacement Dosing Pumps. The pumping action is achieved by a reciprocating piston which is usually shielded from the process by a diaphragm. The diaphragms are actuated by a hydraulic fluid between the piston and the diaphragm. In the event of an accidental rupture or leak in the diaphragm, the chemicals can get into the pump internals, leading to costly repairs, shutdowns, and environmental and other safety concerns.

Solution To avoid this, the Positive Displacement Dosing Pumps incorporate a diaphragm rupture detection system. This system consists of a secondary back up diaphragm over the primary diaphragm in the pump. These are normally held close together and separated by a small hollow ring. A pressure switch is used to detect any pressure change in the interstitial gap between these diaphragms. In the event there is a rupture or leak, it usually only effects the secondary diaphragm. The pressure switch senses this pressure and opens the contact to cut off power to the pump and, in many cases, may also provide an alarm. One of the biggest challenges is the high discharge pressure from the pump. The pump trips at a low increasing pressure setting on the pressure switch, to ensure there is no build-up of any additional pressure in the system. However, the pressure switch should also be rated for a high design pressure, so even if there is a pressure build up in the skid, it should not damage or affect the performance of the pressure switch. The SOR® Pivot Seal Pressure Switches are most suited for this application because of their high overrange capability. In case the design or overrange pressure is low, many of our other pressure switches could also be used for the same application.