Technical Bulletin

Swagelok Bangalore

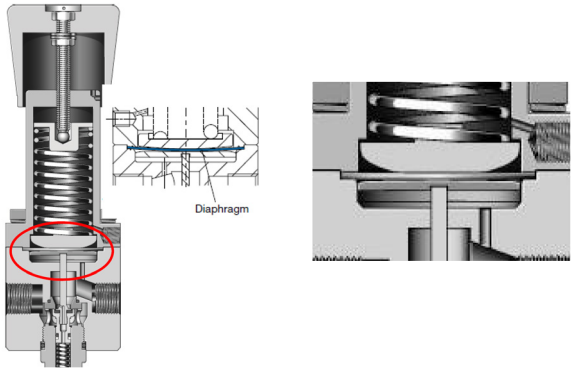
Regulator Selection - Diaphragm v/s Piston Sensing

Pressure regulators are highly technical and specialized fluid-handling components. In the process of regulator selection, the application needs to be defined with consideration given not only to the pressure requirements, but also to the flow rate, gas/liquid composition and temperature. Proper selection can help to avoid undesirable conditions, whereas poor selection can lead to failures.

Diaphragm Sensing

Features

- Generally the most sensitive in response to pressure changes, especially in low-pressure applications
- Depending on their rating, they may be used with inlet pressures up to 248 bar and controlled outlet pressures up to 35 bar



Advantages

- Simple
- Inexpensive
- Sensitive
- The diaphragm can be made from a variety of materials to provide increased compatibility with a wide range of fluids
- Provides greater accuracy in sensing changes in outlet pressure

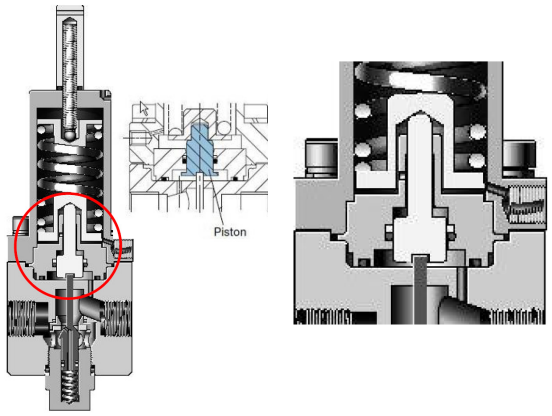
Disadvantages

- Diaphragms can be difficult to seal
- Diaphragms don't usually provide a constant effective sensing area
- Incases where there is a large pressure differential between the source pressure and set pressure, diaphragms can be susceptible to rupture
- Outlet pressure ranges may be limited to reduce the possibility of diaphragm rupture

Piston Sensing

Features

- Piston sensing mechanisms typically are used to regulate higher pressures than a diaphragm can withstand
- Generally used in applications with outlet pressures higher than 35 bar, although they may also be suitable for lower pressures



Advantages

- More resistant to damage caused by pressure spikes and have a short stroke to maximize cycle life
- The piston is contained by a shoulder in the regulator body cap to prevent piston blowout if the regulator outlet is over pressurized
- The piston design has a constant effective sensing area which reduces droop

Disadvantages

- Least sensitive of the three traditional sensing element types
- Can't be used in high purity applications due to O-ring seals
- O-rings create the need for lubrication and raise the issues of fluid compatibility and possible system contamination

Please talk to our Associate or call us for more info

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