Regulator Refresher:

Critical Considerations for Optimal System Performance

The Role of Your Regulator

Pressure Regulators help to safely, effectively, and efficiently maintain or control your expected upstream/downstream pressure, temperature, and flow as your system changes. Use of the wrong regulator could mean dangerous operating conditions and excessive downtime and associated costs.

So, to choose the best regulator for your system, here's a brief guide that explains the Types, Functionality, and Application of these essential self-adjusting components.

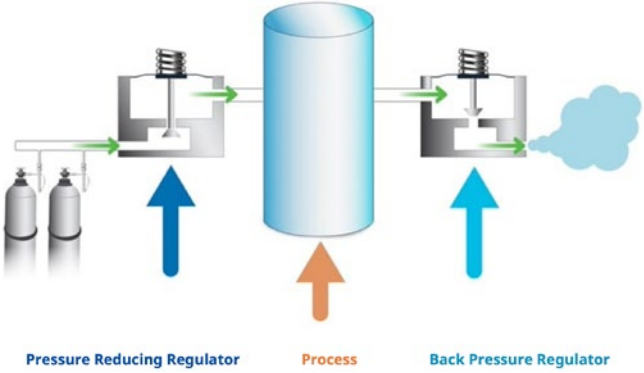
Two Types

1. Pressure-Reducing that sense outlet pressure to control their own downstream pressure. They control pressure TO the process.

2. Back-Pressure that sense the inlet pressure to control upstream pressure. They control pressure FROM the process.

Pressure-Reducing

Thus, **your process requirements drive which regulator you need.** For example, if you must reduce pressure from a high-pressure source before your media reaches the main process: a Pressure-Reducing style is your solution. Conversely, if you need to control and maintain upstream pressure by releasing excess pressure: a Back-Pressure model is your best answer.



Back-Pressure

How Regulators Work

Three components ensure desired pressure regulation/control:

1. Control Element, which includes a Seat that contains pressure and prevents fluids from leaking to the opposite side of the regulator when flow is closed, and a Poppet that, with the Seat, assists the sealing process while the system flows.

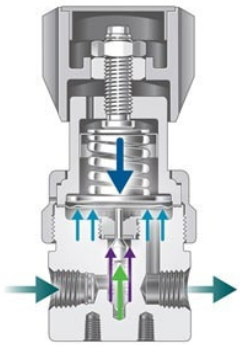
2. Sending Element, such as a Diaphragm or Piston, that enables the Poppet to rise and fall in the Seat to control inlet or outlet pressure.

3. Loading Element, either Spring or Dome, that applies a downward, balancing force on the diaphragm's top.

What to Evaluate Before Selecting Your Regulator

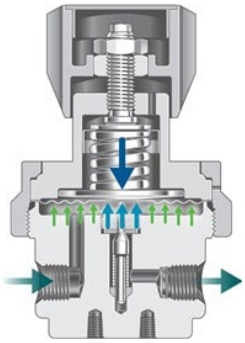
1. **System Flow** that helps you choose the optimum size to maintain a desired pressure. Generally, large regulators handle high flows and control pressures; smaller styles are suited for low-flow velocities. Regulator Elements should be sized appropriately as well. For instance, a large diaphragm or piston is your choice to control low-pressure applications.
2. **System Pressure** that dictates whether you use a regulator rated for maximum, minimum, or operating pressures.
3. **System Temperature** that can fluctuate significantly in your processes. Environmental factors and fluid temperatures need to be considered, too.
4. **Process Sensitivity** plays a key role in determining the ideal control mode for your regulators: Spring-Loaded, that require an operator to turn an external knob to control, or Dome-Loaded that employ fluid pressure from within the system to provide the set pressure on the Sensing Element.
5. **System Media Compatibility with Your Regulator** results in substantially longer component life and lower overall maintenance/operating costs.

We can deliver proven expert Regulator Productivity and Profitability technical support – onsite or over-the-phone, no matter how challenging your fluid-system application.



$F_1 = F_2 + F_3 + F_4$

Pressure-Reducing Regulators must include:
loading force (F1), inlet spring force (F2), outlet pressure force (F3), and inlet pressure force (F4).



$F_1 = F_2 + F_3$

Back-Pressure Regulators must balance:
spring force (F1), inlet pressure force (F2), and outlet pressure force (F3).

Support:

Visit www.swagelok.com/en/blog/how-to-choose-a-regulator

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