Troubleshooting Regulators: A Quick Guide

Experiencing pressure control issues? Use this step-by-step guide to troubleshoot some of the most common problems associated with pressure regulators.

1. Confirm you have the correct regulator for your application.

   Do you need to control your downstream process pressure?
   - Then you need a pressure-reducing regulator.

   Do you need to control your upstream process pressure?
   - Then you need a back-pressure regulator.

   If you determined you have the right regulator, move on to Step 2.
   - If not, consult your supplier.

2. Identify your issue.

   Is pressure dropping below target pressure?
   - Unwanted pressure drop (or droop) is commonly caused by one of two things:
     - An undersized regulator
     - Incorrectly set pressure spring and range

   Is pressure rising beyond target pressure?
   - Supply Pressure Effect (SPE) is a change in outlet pressure due to a change in inlet pressure. If inlet pressure decreases, a corresponding outlet pressure increase will occur.

   Creep happens when contamination creates a small gap between the regulator’s seat and poppet. This results in unwanted pressure increase.

3. Explore your options.

   If you have identified droop as your potential issue:
   - Select a set pressure range closer to the required set pressure
   - A regulator with a larger flow coefficient can help prevent unwanted outlet pressure drop
   - A balanced poppet design can help minimize the area where high inlet pressure can have an impact, mitigating SPE
   - Installing an inline filter upstream of the regulator can reduce contamination
   - Installing a relief valve can protect downstream processes from damaging overpressurization

   If you have identified SPE as your issue:
   - Installing two single-stage regulators in a series or combining two regulators into one assembly can mitigate SPE in most applications

   If you have identified creep as your issue:
   - A dome-loaded regulator may be a better option. This type is more resistant to flow changes and can help better maintain pressure in applications where flow varies.

Have you determined an alternate regulator may help in your application?
Contact your supplier. At Swagelok, our regulator specialists can help guide you toward the right solution.

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