

Introduction to Gas Pressure Regulators



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9+ years of service!

**General Purpose or Analytical?**

General-purpose gas regulators usually are best suited for applications involving gases that are less than 99.995% pure: pneumatically-actuated valves and autosamplers, blanketing, inert atmospheres, and any other application not directly integrated with analytical data production. General purpose gas regulators have nylon-reinforced neoprene diaphragms that provide very good pressure control but are prone to air and moisture diffusion and hydrocarbon off-gassing.

Analytical regulators are recommended for applications in which maintaining the purity of a gas or mixture is the overriding concern, i.e., for applications requiring gases that are greater than 99.995% pure. They are commonly used in analytical labs. Analytical regulators have stainless steel diaphragms for pressure control. Stainless steel is not subject to the diffusion and off-gassing associated with neoprene diaphragms, and is easily purged of atmospheric contaminants when put into service.

Dual- or Single-Stage?

Dual-stage gas regulators reduce the source pressure to outlet pressure in two steps. The first stage reduces the inlet pressure to about three times the maximum working pressure. Outlet pressure gas regulation is controlled by the second stage and is set through the use of an adjusting knob. This two-step gas regulation is highly recommended for services requiring a near constant delivery pressure as the source pressure decays, including chromatographic analyses.

Single-stage gas regulators perform the same function as dual-stage gas regulators, but in a single step-down from source pressure to outlet pressure. For this reason, the outlet pressure cannot be as accurately maintained as the source pressure decays. We highly recommend that single-stage gas regulators be used only in circumstances in which the operator can monitor and adjust the regulator as needed, when the regulator is supplied with a nearly constant source pressure, or when additional pressure regulation is supplied downstream.

Brass or Stainless Steel?

Analytical gas regulators made from brass bar stock provide optimum performance for most analytical applications. Brass provides excellent strength and cleanliness and the machined bar stock design has less dead volume than forged-body gas regulators, making purging of atmospheric contaminants faster and more assured.

Gas regulators with stainless steel bodies were designed for delivering corrosive gases that would be incompatible with brass. With the advent of semiconductor manufacturing and high sensitivity analytical techniques, stainless steel also has proven to be a better surface for removing "sticky" atmospheric contaminants that interfere with detectors downstream. Unless these gas regulators are used in an all-stainless-steel system that incorporates welded tubing and special fittings, and in which rigorous cleaning and proper gas management are practiced, the extra expense relative to brass is not justified.