



Peak Performers

Introduction to Pressure Regulators

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General Purpose or Analytical?

General-purpose 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 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 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 regulation is controlled by the second stage and is set through an adjusting knob. This two-step regulation is highly recommended for services requiring a near constant delivery pressure as the source pressure decays, including chromatographic analyses.

Single-stage regulators perform the same function as dual-stage 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 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 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 regulators, making purging of atmospheric contaminants faster and more assured.

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 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.

Overview of Restek’s Brass and Stainless Steel Body Ultra-High-Purity Regulators

These regulators feature metal-to-metal seals throughout for long-term leak-tightness, and a metal diaphragm outlet valve ensures gas purity. Each regulator is helium leak-test-certifiable to 1×10^{-8} scc/sec. and is fully assembled and tested for your convenience. 100psig maximum delivery pressure supports pressure controlled operation. Maximum inlet pressure is 3000psig. Brass bar stock construction minimizes dead volume. Stainless steel construction is more easily purged of atmospheric contaminants, and is more resistant to attack from dry corrosive gases.

Ultra-High-Purity Stainless Steel Body Regulators

These regulators are the standard for ultra-high-purity and corrosion-resistant pressure regulation. They are more easily purged of atmospheric components, compared to brass regulators, making them ideal for the most demanding applications. Regulation performance is equal to our brass body regulators. For use in all-stainless steel systems where welded tubing and special fittings are used, and rigorous cleaning and proper gas management are practiced.

Dual-Stage Ultra-High-Purity Stainless Steel Regulators

- Most stable outlet pressure control throughout the life of a high-pressure gas cylinder.
- Secondary pressure regulation not needed.

Outlet pressure: 0 to 100psig
 Outlet gauge: 30" – 0 to 200psig
 Inlet gauge: 0 to 4000psig
 Outlet assembly: diaphragm valve, 1/4" tube fitting



Fitting	qty.	cat.#
CGA 580 (N ₂ , He, Ar)	ea.	20662
CGA 350 (H ₂ , P ₂)	ea.	20663
CGA 590 (Air)	ea.	20664

Single-Stage Ultra-High-Purity Stainless Steel Regulators

- Use when there is secondary pressure regulation downstream.
- Identical gas purity protection as with our dual-stage regulators.

Outlet pressure: 0 to 100psig
 Outlet gauge: 30" – 0 to 200psig
 Inlet gauge: 0 to 4000psig
 Outlet assembly: diaphragm valve, 1/4" tube fitting



Fitting	qty.	cat.#
CGA 580 (N ₂ , He, Ar)	ea.	20665
CGA 350 (H ₂ , P ₂)	ea.	20666
CGA 590 (Air)	ea.	20667

Dual-Stage Ultra-High-Purity Chrome-Plated Brass Regulators

- Oxidation-resistant, chrome-plated.
- Most stable outlet pressure control throughout the life of a high-pressure gas cylinder.
- Secondary pressure regulation not needed.
- Most widely used regulator.
- Less internal volume than stainless steel regulators.

Outlet pressure: 0 to 100psig
 Outlet gauge: 30" – 0 to 200psig
 Inlet gauge: 0 to 4000psig
 Outlet assembly: diaphragm valve, 1/4" tube fitting



Fitting	qty.	cat.#
CGA 580 (N ₂ , He, Ar)	ea.	21667
CGA 350 (H ₂ , P ₂)	ea.	21668
CGA 590 (Air)	ea.	21669

Single-Stage Ultra-High-Purity Chrome-Plated Brass Regulators

- Oxidation-resistant, chrome-plated.
- Use when there is secondary pressure regulation downstream.
- Identical gas purity protection as with our dual-stage regulators.

Outlet pressure: 0 to 100psig
 Outlet gauge: 30" – 0 to 200psig
 Inlet gauge: 0 to 4000psig
 Outlet assembly: diaphragm valve, 1/4" tube fitting

Fitting	qty.	cat.#
CGA 580 (N ₂ , He, Ar)	ea.	20646
CGA 350 (H ₂ , P ₂)	ea.	20647
CGA 590 (Air)	ea.	20648

Ultra-High-Purity Chrome-Plated Brass Line Regulator

- Oxidation-resistant, chrome-plated.
- Use where you need to reduce the line pressure by 20psi or more.
- Same purity protection as high-pressure cylinder regulators.

Inlet connections: 1/4" FPT
 Outlet assembly: 1/4" FPT port



Fitting	Outlet Gauge	Outlet Pressure	qty.	cat.#
1/4" female NPT ports*	30" - 0 to 100psig	0-50psig	ea.	21666
1/4" female NPT ports*	30" - 0 to 200psig	0-100psig	ea.	22452

*Order appropriate male connector, pipe-to-tube fittings.

Male Connector, Pipe-to-Tube Fittings

Fitting Type	Size (inches)	Parker #	Similar to Swagelok®	Brass		Stainless Steel	
				qty.	cat.#	qty.	cat.#
Male Connector	1/4" to 1/2" NPT	4 MSC 4N	400-1-4	10-pk.	21842	2-pk.	21942
Male Connector	1/8" to 1/4" NPT	2 MSC 4N	200-1-4	10-pk.	21844	2-pk.	21944
Tube End Reducer	1/4" tube to 1/8"	4 TUR 2	200-R-4	5-pk.	21834	2-pk.	21934



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