EQUILIBAR
PRECISION PRESSURE CONTROL

5X MORE PRECISE than standard regulators

The Ultimate in Precision Pressure Control

SC Series

Precision Back Pressure Regulator

Designed for laboratory and critical applications:

- **Quick-open body**
- **Ultra low flow**
- **Ultra low pressure**

- **Gas applications, or**
- **Low flow liquid applications**

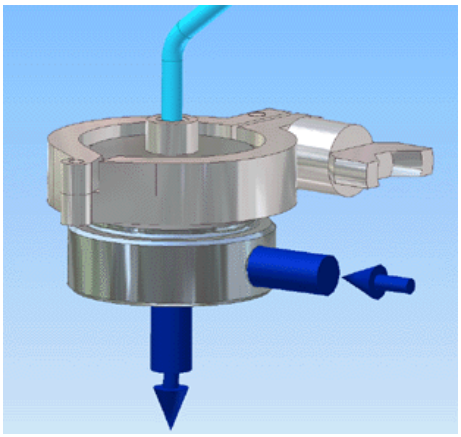
- **Pressure ranges 0.02 psi to 100 psi**
- **Lowest available pressure ranges**
- **Lowest available flow ranges**
- **Highest available sensitivity**

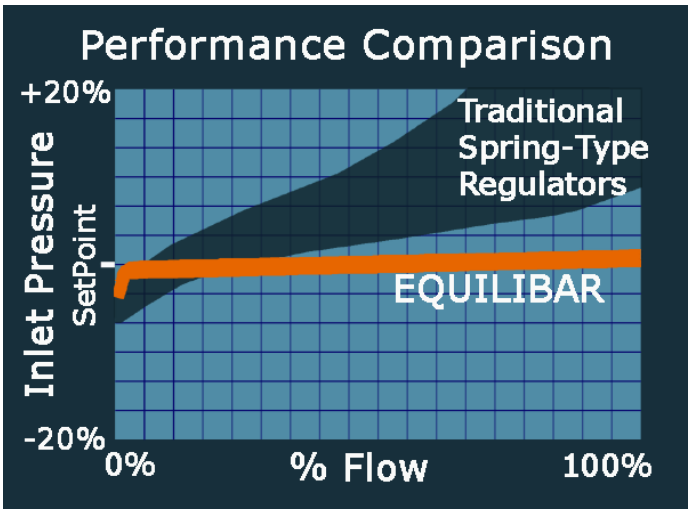
Unique Back Pressure Regulators

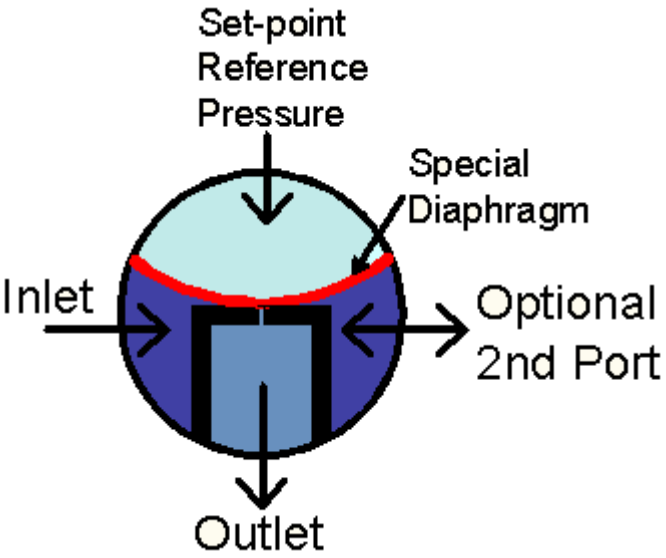
- 5X more Precise than standard Back Pressure Regulators
- Dome loaded: for Manual or Automated control
- Elegant friction-less design
- Suitable for aggressive chemistries
- Available options for hygienic and ultra-pure applications

Unmatched Precision . . .

The EQUILIBAR® back pressure regulator is an exciting breakthrough in precision pressure control. Designed for critical and demanding processes, the patented EQUILIBAR® offers unmatched precision across a wide range of pressures and flow rates.







How the EQUILIBAR® Back Pressure Regulator works

The EQUILIBAR® Precision Back Pressure Regulator works like a **fluid transistor** by forming a unique force balance on an flexible membrane between three separate pressures.

The fluid inlet pressure and the downstream exhaust pressure exist on the wetted side of the membrane, separated by a valve seat. The reference air pressure exists on the non-wetted side

The lower pressure of the outlet tries to hold the membrane in a leak-tight seal with the valve seat. However, any slight excess between the fluid inlet pressure and the reference pressure quickly overwhelms these seating forces and pulls the membrane away from the valve seat.

Traditional backpressure regulators use springs to gradually open up as the overpressure is used to compress the spring.

The EQUILIBAR® pressure regulator uses only a frictionless flexible membrane to modulate the pressure. It fully opens in less than 1 psi overpressure; less than 0.01 psi in some applications.

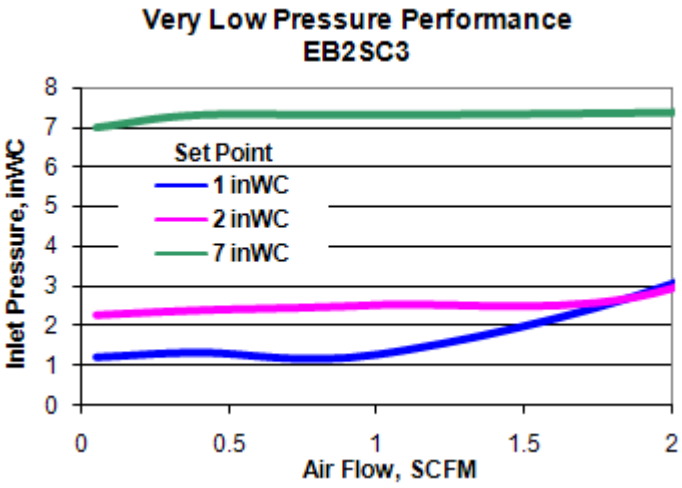
Equilibar back pressure technology is protected by US and foreign patents.

Pressure Stability that sets a new industry standard . . .

Low Pressure . . .

The chart at right demonstrates the performance at very low pressures.

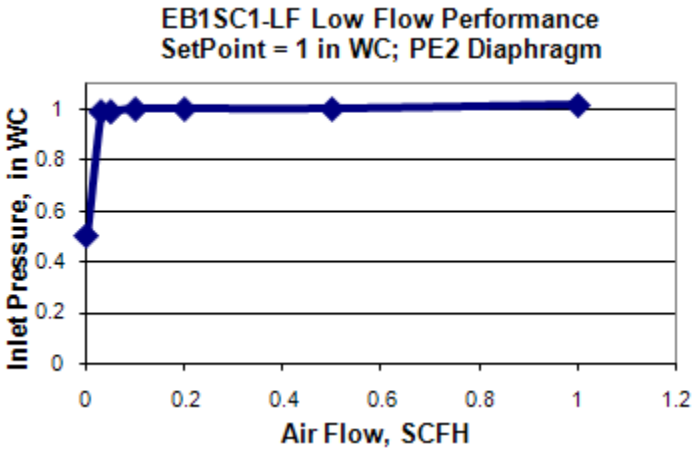
The flow capacity of the regulator is very dependant on the pressure set-point. For example, at 1 inWC, the inlet pressure starts to climb above 1 SCFM. However, at higher pressure set-points, the regulator remains stable to much higher flow rates.



Low Flow . . .

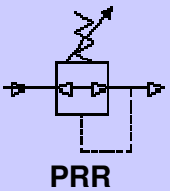
Very low flow rates can be a real challenge for traditional back pressure regulators. The challenge becomes even harder at low pressures.

The Equilibar specializes in ultra low flow applications, regardless of the pressure range.



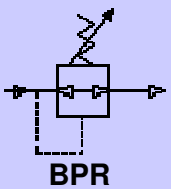
Back Pressure Regulator vs. Pressure Reducing Regulator

Pressure Reducing Regulators (PRR's) are the most common type of regulator. They reduce a higher upstream pressure into a controlled, lower downstream pressure. A PRR opens to increase **downstream** pressure and closes to reduce it.



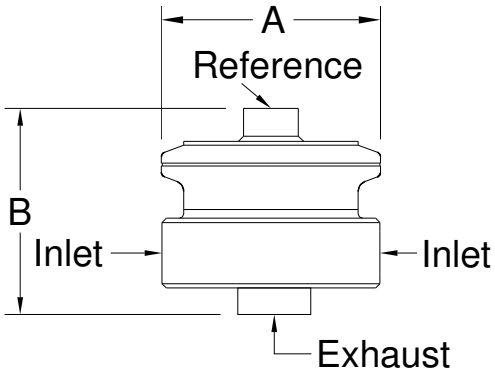
A Back Pressure Regulator (BPR) works in the opposite way, controlling the upstream pressure. Just like a relief valve, a BPR closes to increase **upstream** pressure, and opens to reduce it.

The Equilibar NL Series is a precision **Back Pressure Regulator** that is dome-loaded.



SC Series Details

Porting & Dimensions



Inlet Tee Included

SC regulators typically have 2 Inlet Ports. A plug is provided for user who do not require the second port. This inlet port can be used as a gauge port, or to allow process fluids to flow through the regulator to reduce noise at the application. See schematic on pg. 5.

Metallic SC Series

Model	Port Size	Std Materials	Dim A	Dim B	Max Std Press.	Flow Cv	Available End Connections	
			(inch)		(psig)		NPT	Others
EB1SC1-LF	1/8"	SS316	2.0	1.9	150	0.1	std	Butt weld VCO/VCR Tri-Clamp
EB1SC1						1.0		
EB2SC2	1/4"		2.5	2.7	100	1.3	std	
EB2SC3	3/8"						std	

Polymeric SC Series

Model	Port Size	Std Materials	Dim A	Dim B	Max Std Press.	Flow Cv	Available End Connections	
			(inch)		(psig)		NPT	Others
EB1SC1-LF	1/8"	PVC (std) PVDF Acetal	2.0	1.9	75	0.1	std	Butt weld Socket
EB1SC1						1.0		
EB2SC2	1/4"		2.5	2.7	75	1.3	std	
EB2SC3	3/8"						std	

Available Diaphragms

Material	Pressure Range
PolyEthylene	0.01 to 10 psig
Viton (reinforced)	0.5 psig to maximum body pressure
Buna N (reinforced)	
EPDM (reinforced)	
PTFE/Glass	
PTFE	0.5 - 50 psig

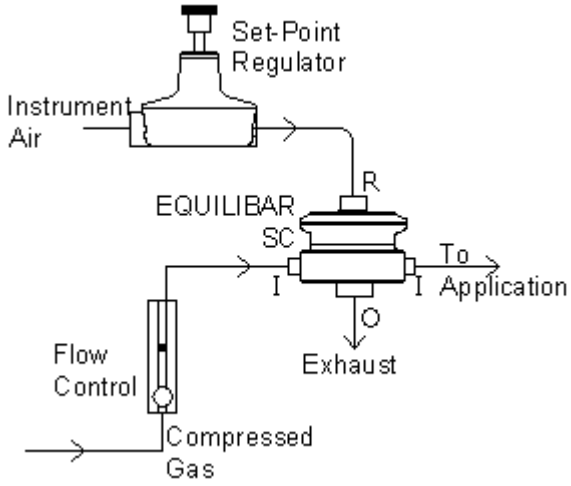
Dimensions and Cv values are subject to periodic revision.

Applications

There are dozens of possible applications for the Equilibar Precision Back Pressure Regulator.

The SC Series can be used for most gas applications as well as low flow liquid applications. Because the SC does not have a chatter suppression feature, medium to high liquid flow applications should use the NL Series.

See our website at www.equilibar.com for additional application details.



Precision Gas Supply System

The SC is particularly well suited for low pressure gas control. The dual inlet ports allow for a “flow-through” configuration that reduces friction losses and error.

A flow control device sets the flow rate just higher than the maximum Application requirement. The Equilibar SC back pressure regulator exhausts the flow not required by the application.

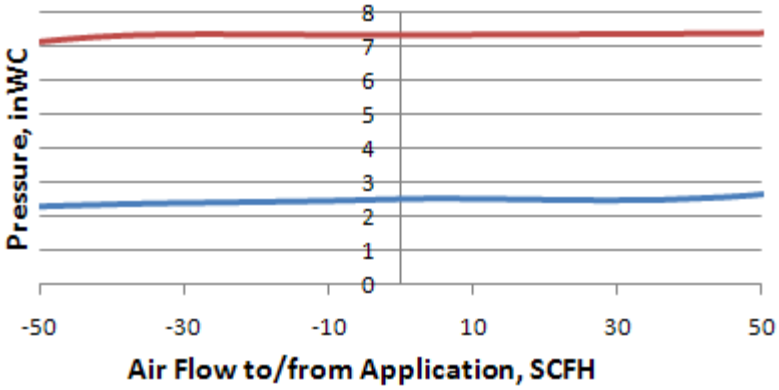
The result is incredibly stable pressure control, regardless of flow rate to the Application. This precision also applies to bi-directional flow to or from the application.

Bi-Directional Stability

The chart at right shows how the EB2SC2 can be used with the Precision Gas Supply System above to provide a bi-directional gas control system.

Such systems can be used in tubing extrusion systems to improve product quality by providing

EB2SC2 Performance Curve



Set-Point Kits for every application . . .

EQUILIBAR Precision Back Pressure Regulators get their precision from using a fluid set-point pressure (also called 'reference' or 'pilot' pressure) on their top port.

Customers can supply their own fluid set-point signal, or choose one of the optionalaccessories below.

Method	Pressure Range	Description
Ultra Low Pressure **Equlibar LPR2** 	0.5 to 8 inWC (0.02—0.3 psig)	Lowest pressure range available in its class. For low-flow applications only. Extremely sensitive and stable over time. 1/4" inlet/outlet ports. Inlet pressure: 10-50 psig
High Precision 2-stage **Type 10** 	0.5 to 25 psig 2 to 25 psig 2-60 psig 2-120 psig	2-stage regulator offers highest precision available in these pressure ranges. Extremely sensitive and stable.
Compact Economical 	0-15 psig 0-30 psig 0-60 psig 0-100 psig	Compact, economical regulators work well in most applications. Bodies made from ABS, brass. Details may vary upon application.
Computer Automation **Electro-Pneumatic Regulator** 	0-0.3 psig 0-1 psig 0-5 psig 0-15 psig 0-30 psig 0-100 psig 0-150 psig 0-300 psig 0-1000 psig	Electro-Pneumatic Regulators, sometimes called "I to P" or "E to P" regulators, provide highly precise set-point control with the benefits of computer automation. Equilbar represents Bellofram Type 3000 EPRs as well as those from ProportionAir.

Contact our Engineers

At Equilibar, your application's unique requirements will be carefully addressed by one of our trained application engineers. Please contact us if you have any questions or special requirements.

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Typical Applications and Industries

Though new, the EQUILIBAR® has earned an impeccable record of performance in a wide range of customer applications. Our satisfied customers include many demanding multi-national corporations as well as space, science, and military arms of the U.S. Government.

- Fuel Cells and Fuel Cell test stands
- Hydraulic test stands - aerospace
- Ultra low pressure laboratory applications
- Petro-chemical processing
- Aggressive acid processing / ultra-filtration
- Vacuum control for bio-technology
- Coating fluid delivery
- Consumer product pressure testing

About Equilibar

Equilibar manufacturers and markets our specialized products worldwide. Equilibar branded products are made in the USA, and protected by US and foreign patents.

All of our products are fully inspected and tested by trained technicians.

Other Equilibar BPR Styles

The flagship **EQUILIBAR NL Series** serves most industrial and liquid applications.

- Rugged bolted construction
- Pressures up to 1000 psi (and above)
- Chatter suppression system for liquid

EQUILIBAR also offers the SC Series with Quick-Clamp sanitary fittings on a special-order basis. These designs are fully drainable and crevice-free, but do not carry agency approvals.

The **EQUILIBAR LF** Series also specializes in Ultra Low Flow applications.

- VCO-style or VCR-style fittings available
- Pressures up to 1000 psi (and above)