

EVR Series Precision Vacuum Regulators

**Incredibly stable vacuum control
across widely varying flow rates!**

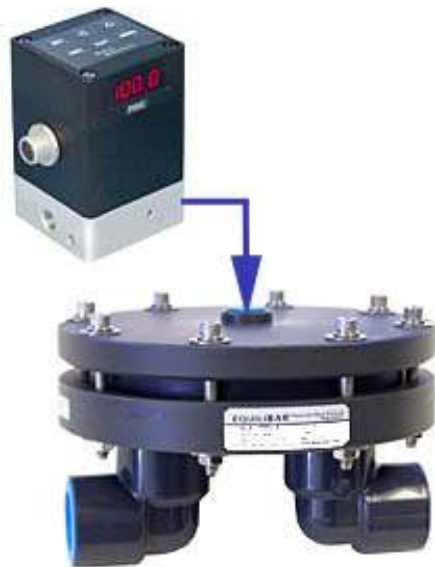
Equilibar introduces a new type of vacuum regulator with more than 5X the flow stability of traditional spring regulators. That means that your vacuum process can remain stable even as gas flow changes.

- Can be used with manual set-point adjustment or computer automation
- Is installed between your vacuum pump and your process
- Controls in range 0 - 30 inHg
- Available sizes 1/4" through 3"
- Available in Stainless Steel, PVC, or other materials



Manual Set-Point Adjustment

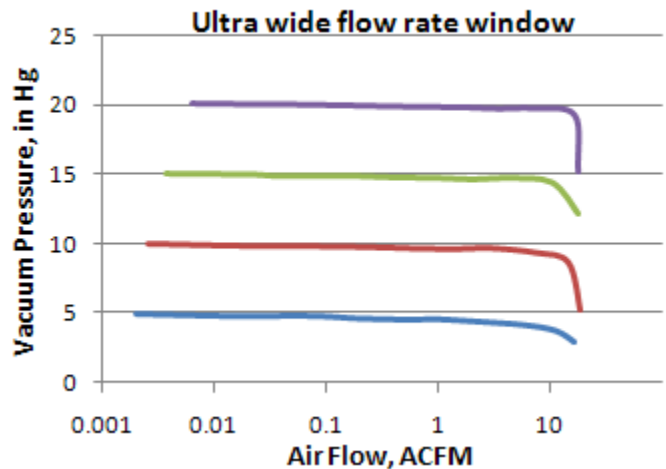
The 2-stage regulator above uses a sensitive 20-turn pilot regulator to provide the set-point pressure for the larger Equilibar regulator below.



Computer Automation

The Equilibar Vacuum Regulator is easily paired with an electro-pneumatic regulator to provide easy process automation.

3/8" EVR-3 Air Performance Testing



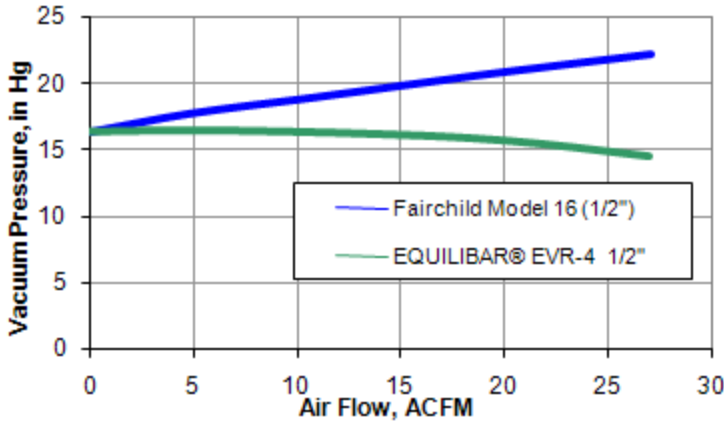
Stability

This chart above shows the excellent vacuum stability through various flow rates and pressure ranges.

Traditional vacuum regulators have much larger pressure variability with increasing flow rates.

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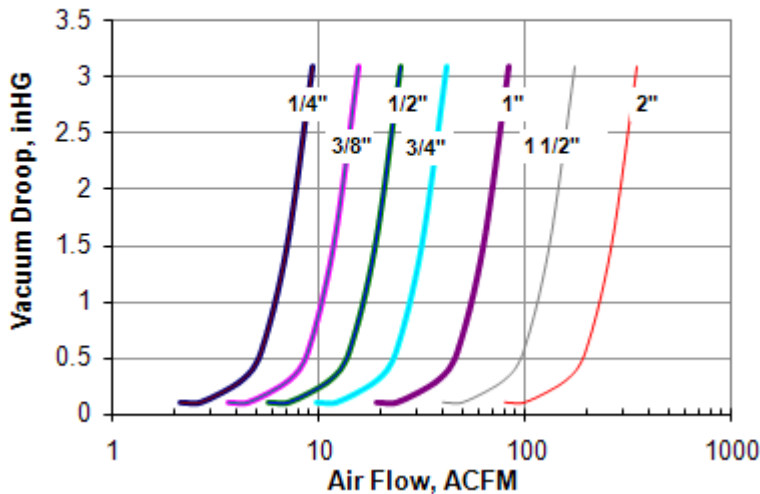
1/2" EQUILIBAR® vs. Fairchild Model 16
Vacuum Flow Stability Curve



Dramatic stability improvement

This chart shows the superior flow stability of the 1/2" Equilibar® over the Fairchild 16. Note that the Fairchild works by bleeding air into the vacuum system rather than directly modulating the applied vacuum, explaining the opposite curvature.

EQUILIBAR Vacuum Regulator
Flow Sizing Chart



Selecting the right size

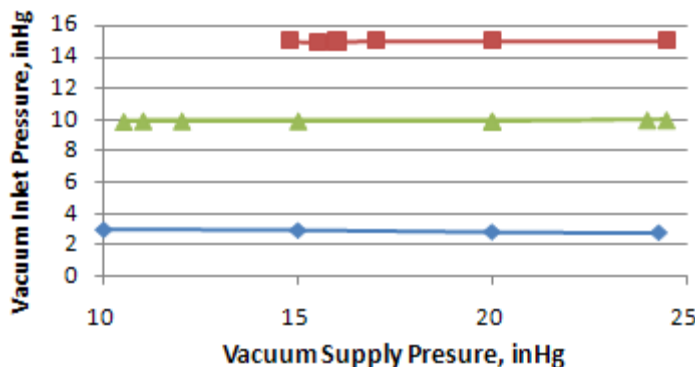
This chart at left shows the projected vacuum performance at various regulator body sizes. For a given regulator size, as flow increases past a critical point, 'droop' increases. Droop is defined as the reduction in vacuum pressure due to friction in the regulator.

In order to select the optimum size for your application, find the smallest regulator that has acceptable pressure variance in your flow range.

For example, for flow rates between 5 and 20 ACFM, the 3/4" shows only 0.2 psi variance and would be acceptable for most applications. The 1" regulator shows virtually no variance in this range.

If you don't know your flow rates, you can select the Equilibar Vacuum Regulator to match your existing pipe size.

Effect of Vacuum Supply
3/8" EVR-3, 1 SCFH leakage



Stability w/ varying Supply Pressures

The inlet pressure of most vacuum regulators vary significantly with changes in vacuum supply pressure.

The chart at left shows how stable the EVR is to widely varying supply pressures.

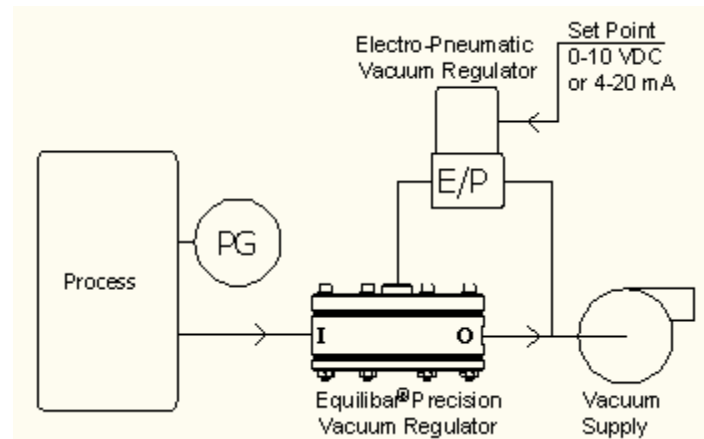
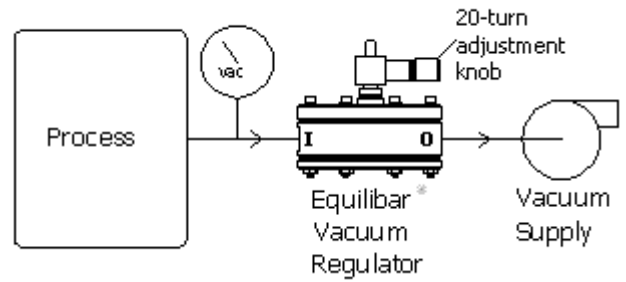
EVR Series Precision Vacuum Regulators

How it works

Our new vacuum regulator uses the same patented technology as the Equilibar® Precision Back Pressure Regulator, with unmatched precision across varying flow rates.

The Equilibar® Vacuum Regulator is a dome-loaded regulator, meaning that a pilot set-point pressure is required. The larger regulator works to restrict flow between your vacuum pump and your process in order to keep your process very closely matched to the pilot set-point pressure.

For manual applications, a sensitive 20-turn vacuum regulator is used to supply the set-point (see above right). For computer automation, an electro-pneumatic regulator is used to provide the set-point signal.

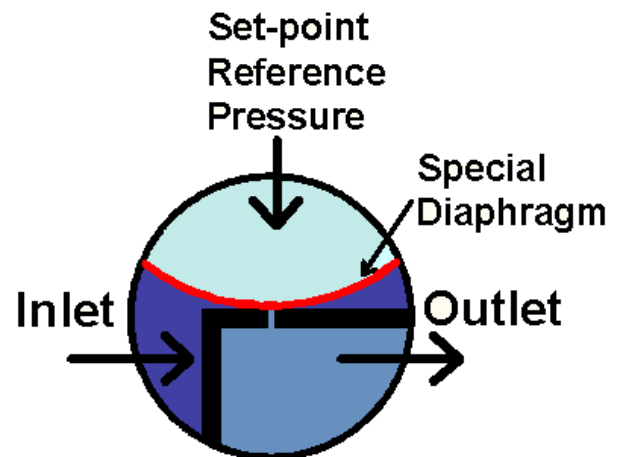


Unique Direct-Sealing Diaphragm Technology

The key to the incredible performance of the Equilibar Vacuum Regulator is the unique direct sealing diaphragm regulator technology. It 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.



Vacuum Regulators w/ Integrated Manual SetPoint Kit

For manually adjusted applications, our integrated set-point kit provides for maximum convenience. A sensitive 20-turn set-point regulator is provided for quick installation and adjustment.

EVR Series Precision Vacuum Regulators

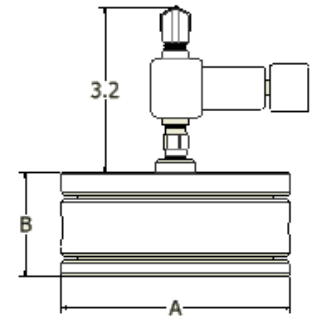


Metallic Regulators 3/4" and smaller

Model	Port Size	Std Materials	Dim A	Dim B	Flow Cv	Available End Connections					
						(inch)		NPT	Butt weld	VCR (SS316)	VCO (SS316)
EVR-2	1/4"	SS316 (std) SS304 Carbon Steel Brass C360	3.0	1.6	1.0	std	avail.	4-VCR	4-VCO	SAE-4	Vacuum Flange
EVR-3	3/8"		3.5	1.7	1.8	std	avail.	6-VCR	6-VCO	SAE-6	
EVR-4	1/2"		4.5	1.9	3.0	std	avail.	8-VCR	8-VCO	SAE-8	
EVR-6	3/4"		6.0	2.4	6.2	std	avail.	12-VCR	12-VCO	SAE-12	

Polymeric Regulators 3/4" and smaller

Model	Port Size	Std Materials	Dim A	Dim B	Flow Cv	Available End Connections	
						(inch)	
EVR-2	1/4"	PVC (std) PTFE	3.3	1.6	1.0	std	avail.
EVR-3	3/8"		4.0	1.7	1.8	std	avail.
EVR-4	1/2"		4.8	1.9	3.0	std	avail.
EVR-6	3/4"		6.5	2.4	6.2	std	avail.



Regulators 3/4" and smaller are based on the Equilbar NL back pressure regulator, using bar stock construction..

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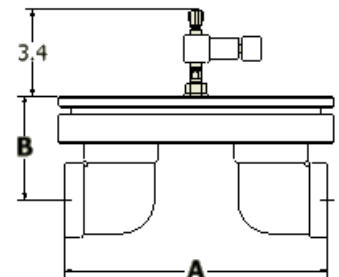
Metallic Regulators 1" and larger

Model	Port Size	Std Materials	Dim A	Dim B	Flow Cv	Available End Connections		
						NPT	Butt weld	Vac Flange
EVR-8	1"	SS316 (std) SS304 Carbon Steel	6.8	2.1	9.9	std	avail.	avail.
EVR-12	1 1/2"		8.8	3.1	14.3	std	avail.	avail.
EVR-16	2"		10.8	4.1	30.2	std	avail.	avail.
EVR-24	3"		12.7	6.1	60.0	std	avail.	avail.

Dimensions and Cv are for guidance and are subject to revision over time.

Polymeric Regulators 1" and larger

Model	Port Size	Std Materials	Dim A	Dim B	Flow Cv	Available End Connections	
						NPT	Socket weld
EVR-8	1"	PVC	7	3.1	9.9	std	avail.
EVR-12	1 1/2"		9.0	4.3	14.3	std	avail.
EVR-16	2"		11	3.0	30.0	std	avail.
EVR-20	2 1/2"		13	3.5	34.0	std	avail.
EVR-24	3"		17	4.0	60.0	std	avail.



Vacuum Regulators For remote set-point adjustment (including Computer Automation)

The Equilbar Vacuum Regulator is a 2-stage regulator system. A set-point pressure signal must be generated by a manual or electro-pneumatic regulator. The lower regulator is uses our patented back pressure regulator to match your process pressure to this set-point signal.

For customer needing computer automation, or a remotely located adjustment knob, the lower regulator will be sold separately as a "back pressure regulator" for the vacuum range.

EVR Series Precision Vacuum Regulators

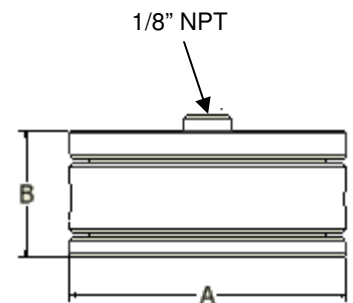


Metallic Regulators 3/4" and smaller

Model	Port Size	Std Materials	Dim A	Dim B	Flow Cv	Available End Connections					
						(inch)		NPT	Butt weld	VCR (SS316)	VCO (SS316)
EB2NL2	1/4"	SS316 (std)	3.0	1.6	1.0	std	avail.	4-VCR	4-VCO	SAE-4	Vacuum Flange
EB3NL3	3/8"		3.5	1.7	1.8	std	avail.	6-VCR	6-VCO	SAE-6	
EB4NL4	1/2"	Carbon Steel	4.5	1.9	3.0	std	avail.	8-VCR	8-VCO	SAE-8	
EB5NL6	3/4"	Brass C360	6.0	2.4	6.2	std	avail.	12-VCR	12-VCO	SAE-12	

Polymeric Regulators 3/4" and smaller

Model	Port Size	Std Materials	Dim A	Dim B	Flow Cv	Available End Connections	
						(inch)	
EB2NL2	1/4"	PVC (std) PTFE	3.3	1.6	1.0	std	avail.
EB3NL3	3/8"		4.0	1.7	1.8	std	avail.
EB4NL4	1/2"		4.8	1.9	3.0	std	avail.
EB5NL6	3/4"		6.5	2.4	6.2	std	avail.



Regulators 3/4" and smaller are based on the Equilbar NL back pressure regulator, using bar stock construction..

Regulators 1" and larger are based on the Equilbar NLB back pressure regulator, using welded external elbows.

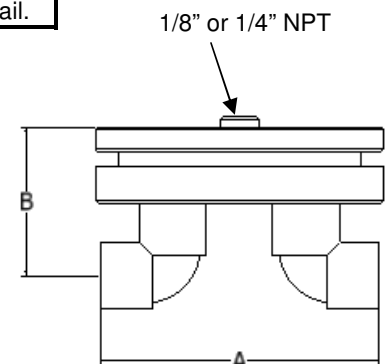
Metallic Regulators 1" and larger

Model	Port Size	Std Materials	Dim A	Dim B	Flow Cv	Available End Connections		
						(inch)		NPT
EB6NLB8	1"	SS316 (std) SS304 Carbon Steel	6.8	2.1	9.9	std	avail.	avail.
EB8NLB12	1 1/2"		8.8	3.1	14.3	std	avail.	avail.
EB10NLB16	2"		10.8	4.1	30.2	std	avail.	avail.
EB16NLB24	3"		12.7	6.1	60.0	std	avail.	avail.

Dimensions and Cv are for guidance and are subject to revision over time.

Polymeric Regulators 1" and larger

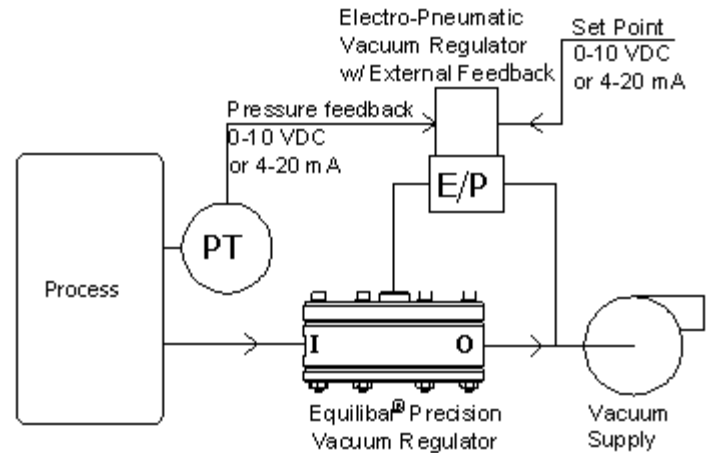
Model	Port Size	Std Materials	Dim A	Dim B	Flow Cv	Available End Connections	
						(inch)	
EB6NLB8	1"	PVC	7	3.1	9.9	std	avail.
EB8NLB12	1 1/2"		9.0	4.3	14.3	std	avail.
EB10NLB16	2"		11	3.0	30.0	std	avail.
EB12NLB20	2 1/2"		13	3.5	34.0	std	avail.
EB16NLB24	3"		17	4.0	60.0	std	avail.



EVR Series Precision Vacuum Regulators

Application: Computer Automation with External Feedback

Electro-pneumatic regulators can monitor external pressure transmitters and adjust their set-point signal to eliminate small offsets. Such systems can be used for test systems or calibration systems where no offset is allowed.



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.

Web: www.equilibar.com
 Email: info@equilibar.com
 Telephone: (828)650-6590
 Fax: (801)504-4439
 Address: Equilibar, LLC
 320 Rutledge Road
 Fletcher, NC 28732

Non-Relieving Regulator

It is important to note that the Equilibar Vacuum Regulator is a non-relieving type of regulator. This means that if your process has ZERO flow rate, it may be necessary to install a small weep just before the regulator to allow for a reduction in vacuum set-point.

It is also a good idea to have at least some gas flow through the regulator to compensate for minute leakages in the seat. Fortunately, most processes have more than enough in-leakage to address this issue.

About Equilibar

Equilibar, LLC 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.

Back Pressure Regulators From Equilibar

The **EQUILIBAR NL Series** Precision Back Pressure Regulator provides unmatched precision from 0.02 to 1000 psig.

