



QBS Electronic Control Valve

For Pressures Up To 500 psi

About Equilibar QBS

The Equilibar QBS is an electronic pressure regulator designed to accurately control the pressure of gaseous media proportional to an electronic signal. It is primarily used for pressures up to 500psi (35 Bar).

The QBS operates using two normally closed solenoid valves, a pressure sensor, and a control circuit. One valve is actuated to allow unregulated supply media to flow in and raise the system pressure. The second valve is actuated to allow working media to vent to atmosphere and lower the pressure in the system. An internal pressure sensor provides feedback to the control circuit. The control circuit compares the pressure sensor feedback to the user supplied electronic command signal and actuates the appropriate solenoid valve until the two signals match.

The QBS is most often used to provide the pilot reference pressure to an Equilibar® back pressure regulator. However, the QBS is useful in any application where a relatively small closed volume requires the pressure to be either accurately or remotely controlled.

The QBS series product comes with an electronic monitor output signal. This monitor output is an electrical signal originating from the internal pressure transducer used in the control circuit. The signal allows the system pressure to be remotely monitored

and also provides a useful signal for data acquisition needs. The output of this signal can be configured to either 0- 10Vdc or 4-20mA.

The QBS is built using a rugged stainless steel manifold and is contained within a protective NEMA4/IP65 enclosure.

The QBS2 is similar to the QBS1 but uses a double loop control scheme. In addition to the internal pressure transducer, the QBS2 also receives a 0-10Vdc feedback signal from an external pressure sensing device. The external pressure signal functions as the primary feedback and is compared directly to the command signal.

A difference between the two comparisons causes one of the two solenoid valves to open allowing flow in or out of the system as required. The QBS2 second loop is used in a narrow range of applications and is especially useful when pilot operating a pressure reducing regulator (also known as a volume booster). This allows the QBS2 to compensate for any mechanical errors or hysteresis of the volume booster.

An Equilibar DSY or DSTY will work as a second loop feedback to the QBS2. The QBS2 monitor signal mimics the external pressure sensor signal.

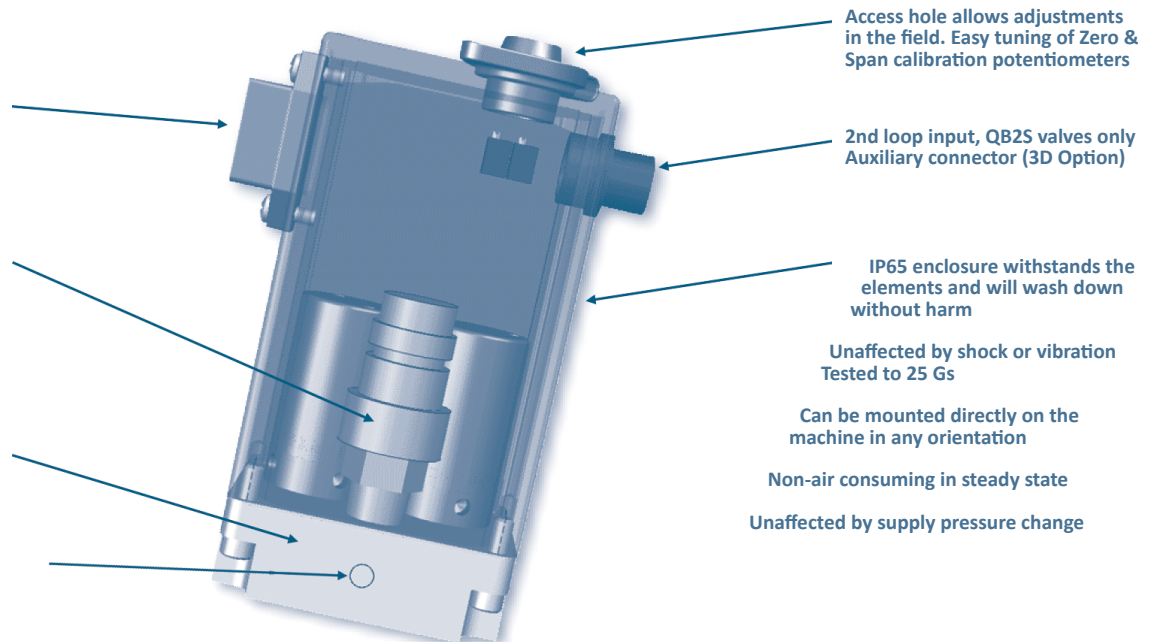
Precision pressure control vacuum to 500 psi (34 bar)

Available in a wide range of electrical control input and analog output

Internal stainless steel pressure sensor, that utilizes dry technology instead of liquid fill, is used for increased reliability and media compatibility

QBS available in anodized aluminum or stainless steel manifold which enhances media compatibility.

Two outlet ports which allows flexibility in mounting options.



Access hole allows adjustments in the field. Easy tuning of Zero & Span calibration potentiometers

2nd loop input, QB2S valves only Auxiliary connector (3D Option)

IP65 enclosure withstands the elements and will wash down without harm

Unaffected by shock or vibration Tested to 25 Gs

Can be mounted directly on the machine in any orientation

Non-air consuming in steady state

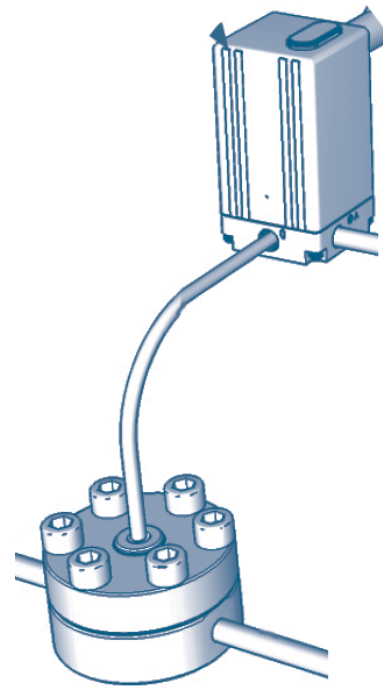
Unaffected by supply pressure change

QB General Specifications

ELECTRICAL	
SUPPLY VOLTAGE	15 to 24 VDC
SUPPLY CURRENT	250 mADC
COMMAND VDC	0 to 10 VDC
COMMAND (CURRENT option)	4 to 20 mADC Differential
MONITOR VDC	0 to 10 VDC
MONITOR (CURRENT option)	4 to 20 mADC
COMMAND SIGNAL IMPEDANCE	Voltage=10 K Ω Current=100 Ω

PNEUMATIC	
INLET PRESSURE	Full Vac - 550 psig
CALIBRATED PRESSURE RANGE	Full Vac up to 500 psig
FILTRATION REQUIRED	40 Micron
ACCURACY (PRESSURE)	$\pm 0.25\%$ F.S.
HYSTERESIS	$\pm 0.2\%$ F.S.
REPEATABILITY	$\pm 0.05\%$ F.S.
PORT SIZE	1/8" NPT Female
CRITICAL VOLUME	1 in ³

WETTED PARTS	Fluorocarbon, Brass, Nickel-Plated Brass, Silicon and Aluminum, Stainless Steel
OPERATING TEMP	32°F to 158°F
PROTECTION	NEMA 4/IP65
WEIGHT	1 lbs. 1.4 lbs. (SS)
ELECTRICAL CONNECTOR	6-pin Hirschman

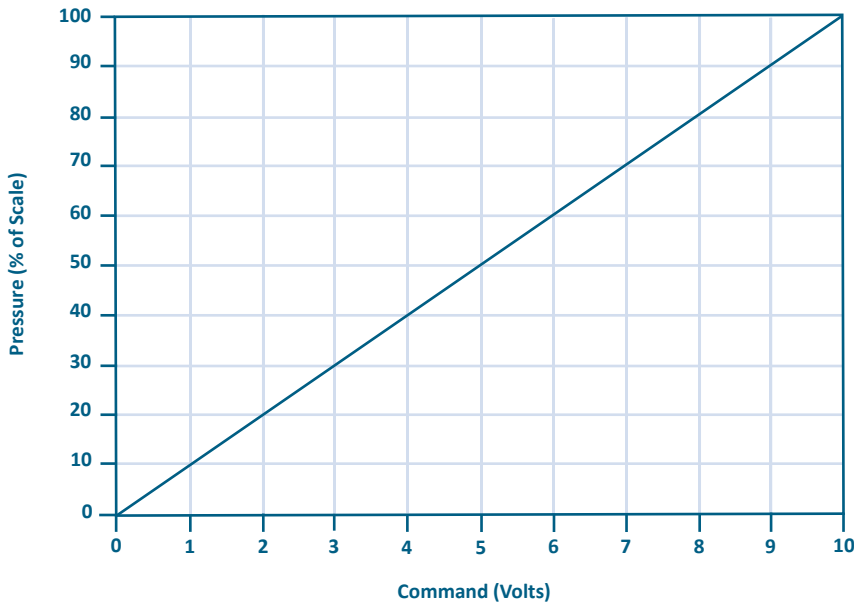


The QBS is shown mounted as a pilot regulator to an Equilibar® precision back pressure regulator



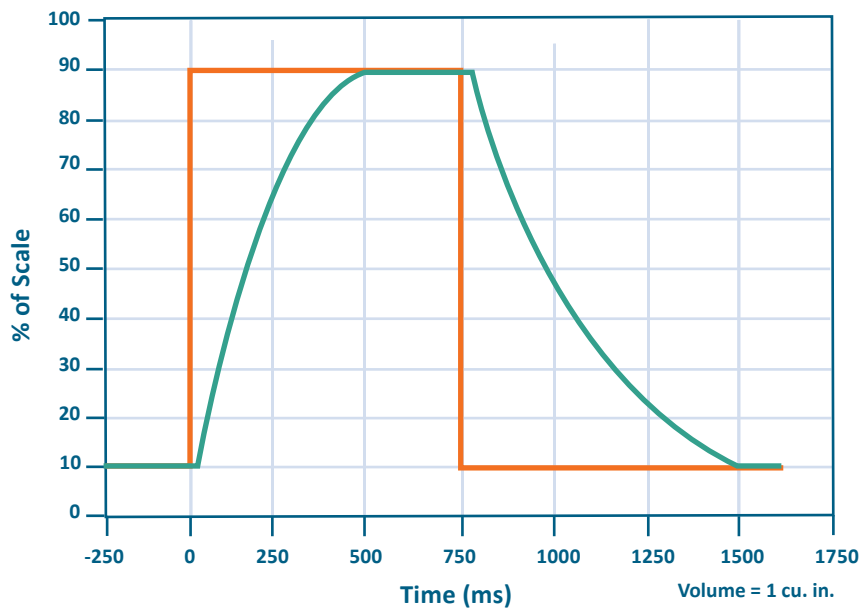
Performance Specifications

LINEARITY



This chart shows the linear characteristics of QB products when given a ramp signal from 0 to 10 volts. Characteristics would be similar for 4 to 20 mA units.

RESPONSE TO STEP INPUT



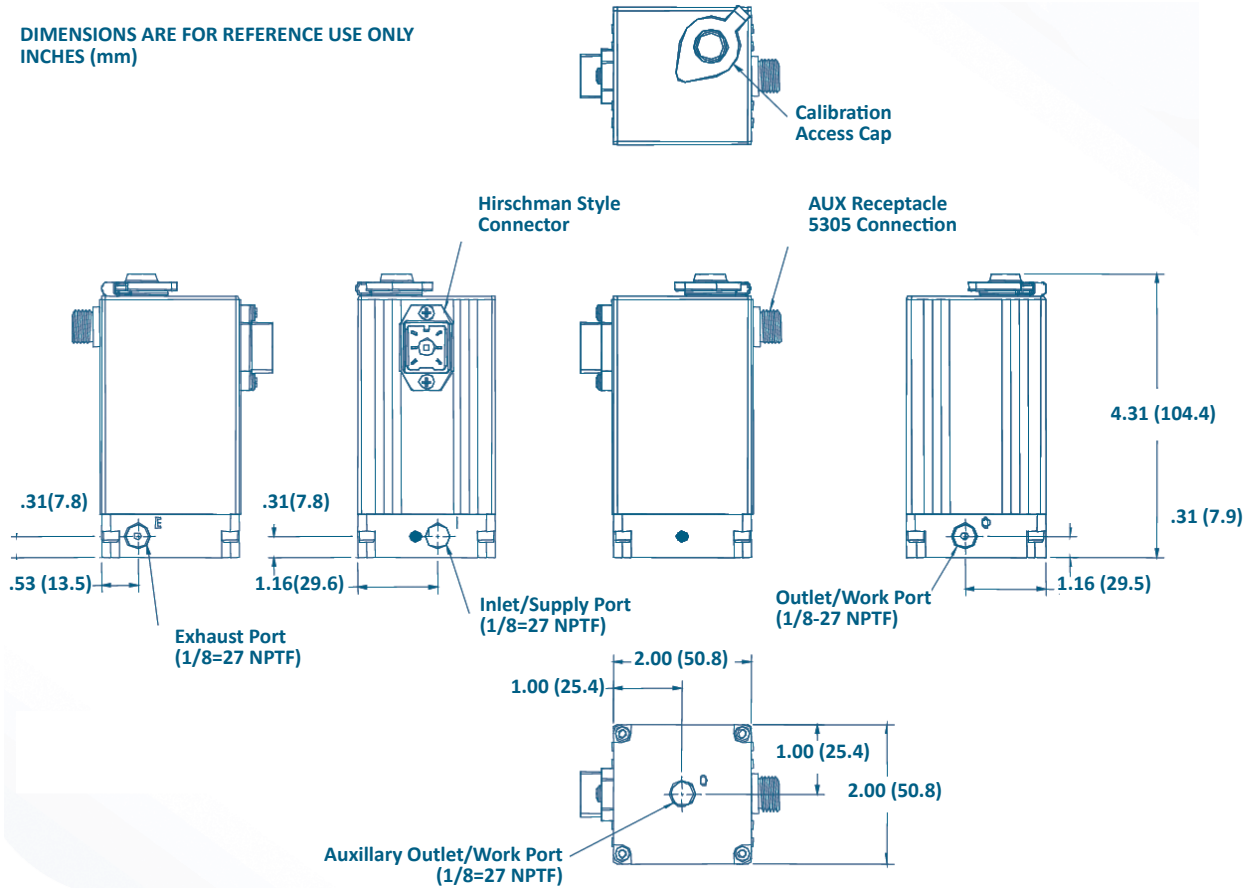
Times for QB to fill/exhaust a closed chamber. Step command signal is superimposed over pressure trace. Time is determined by the difference between command signal and pressure achieved.

GENERAL INLET PRESSURE RATING

FOR VALVE THAT IS ORDERED WITH MAXIMUM CALIBRATED PRESSURE OF:	MAXIMUM INLET PRESSURE IS:
up to 300 psig (20.7 bar)	330 psig (22.8 bar)
301 to 500 psig (20.8 to 34 bar)	550 psig (37.9 bar)

Dimensional Drawing & Accessories

DIMENSIONS ARE FOR REFERENCE USE ONLY
INCHES (mm)



QBT-01



QBT-02



PRE-ASSEMBLED QBT POWER CORD

Part Number: QBT-C- Length in feet*

*6 ft is typical. Other lengths are available
[from 1 to 25 feet (8 meters), 1 foot increments]

WARRANTY

Equilibar products are warranted to the original purchaser only against defects in material or workmanship for one (1) year from the date of manufacture. The extent of Equilibar's liability under this warranty is limited to repair or replacement of the defective unit at Equilibar's option. Equilibar, LLC shall have no liability under this warranty where improper installation or filtration occurred.

All specifications are subject to change without notice. THIS WARRANTY IS GIVEN IN LIEU OF, AND BUYER HEREBY EXPRESSLY WAIVES, WARRANTIES OR LIABILITIES, EXPRESS, IMPLIED OR STATUTORY, INCLUDING WITHOUT LIMITATION ANY OBLIGATION OF Equilibar, LLC WITH REGARD TO CONSEQUENTIAL DAMAGES, WARRANTIES OF MERCHANTABILITY, DESCRIPTION, AND FITNESS FOR A PARTICULAR PURPOSE.

WARNING: Installation and use of this product should be under the supervision and control of properly qualified personnel in order to avoid the risk of injury or death.

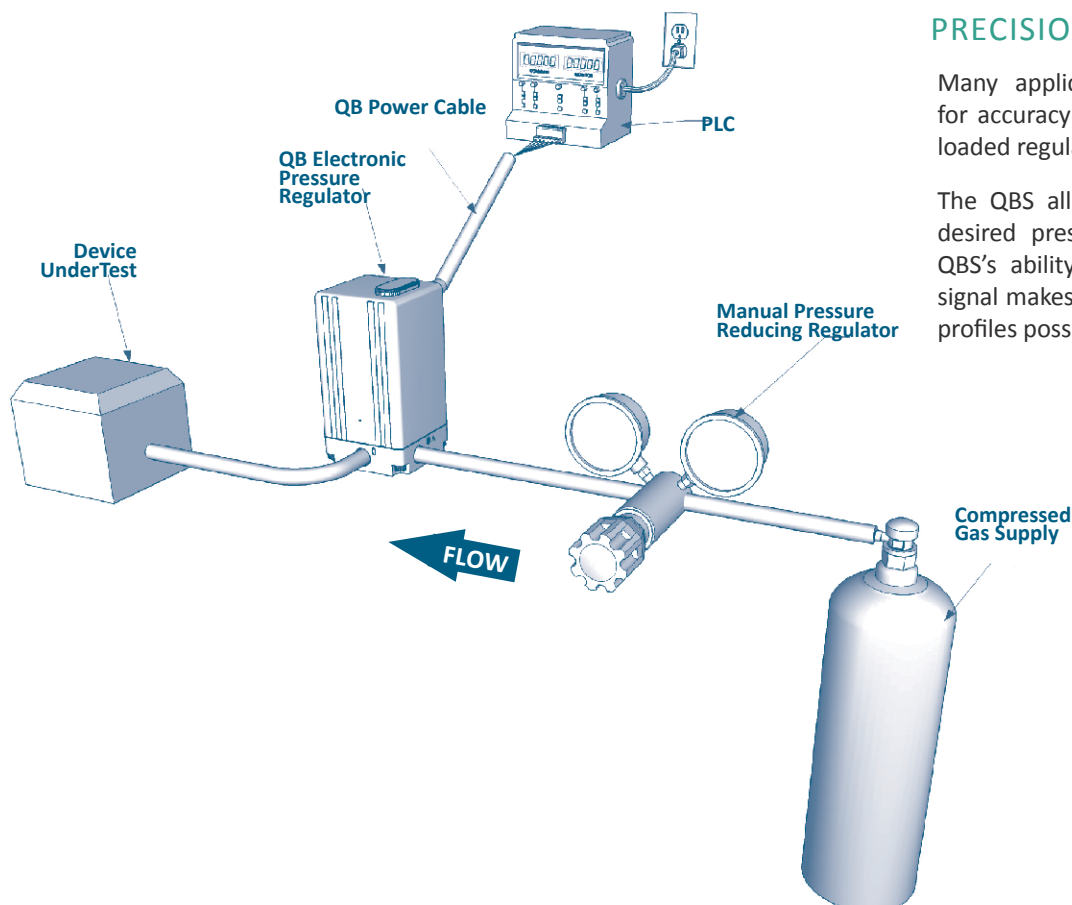
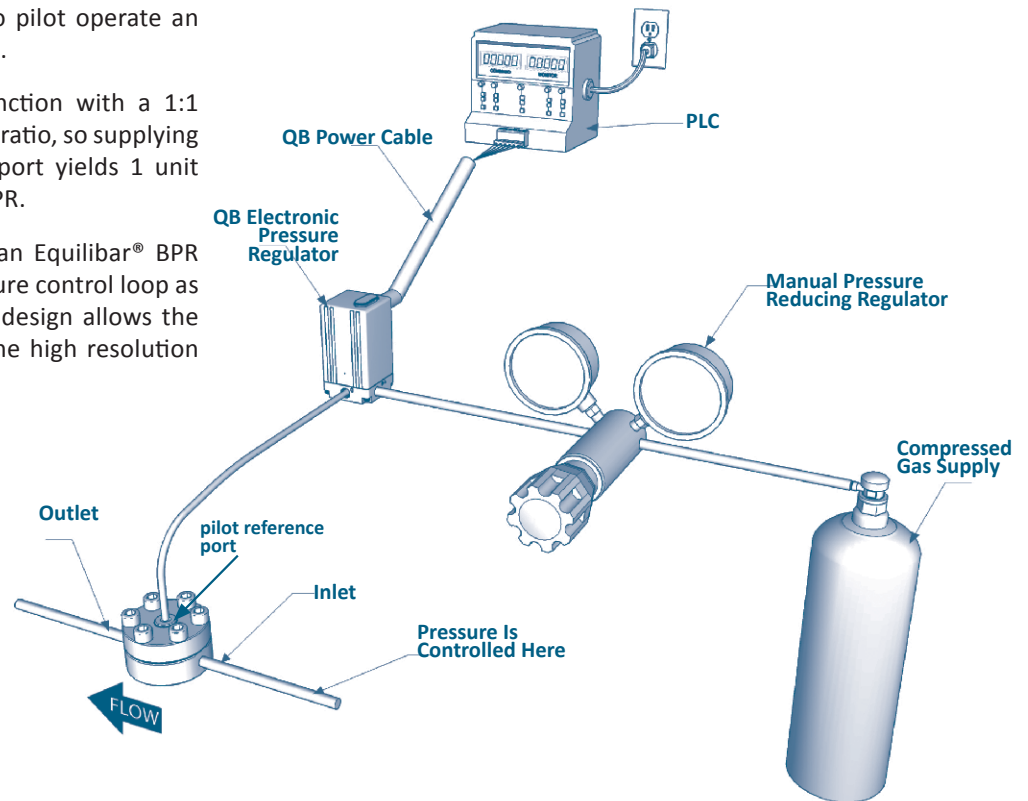
Application Highlights

OPEN LOOP ELECTRONIC BACK PRESSURE CONTROL WITH A QB1S

A common application for the QBS is to pilot operate an Equilibr® Back Pressure Regulator (BPR).

Equilibr® back pressure regulators function with a 1:1 inlet pressure to pilot reference pressure ratio, so supplying 1 unit pressure to the pilot reference port yields 1 unit pressure on the inlet of the Equilibr® BPR.

Using the QBS as a pilot regulator for an Equilibr® BPR creates a precision electronic back pressure control loop as shown below. The frictionless Equilibr design allows the back pressure control to make use of the high resolution of the QBS.



PRECISION GAS PRESSURE DELIVERY

Many applications have stringent requirements for accuracy and stability that a traditional spring loaded regulator simply cannot meet.

The QBS allows a user to very easily reach the desired pressure within 0.25% of setpoint. The QBS's ability to track closely with its command signal makes ramping, falling, and pulsing pressure profiles possible with a properly configured PLC.

QBS Ordering Information

EXAMPLE PART NUMBER	QB	2	SS	E	E	Z		P	0	P	500	PSI	G
Your Part Number:	QB												
		1	2	3	4	5		6	7	8	9	10	11

1 TYPE

- 1 Single Loop
- 2 Double Loop (External Feedback)

2 MANIFOLD MATERIAL

- SS 303 Stainless Steel

3 THREAD TYPE

- N NPT (Standard)
- P BSPP

4 INPUT SIGNAL RANGE

- E 0 to 10 Vdc (Single Ended)
- I 4 to 20 mADC (Differential)
- K 0 to 5 Vdc
- V 1 to 5 Vdc*

*Requires V for MONITOR SIGNAL RANGE

5 MONITOR SIGNAL RANGE

- X No Monitor
- E 0 to 10 Vdc
- K 0 to 5 Vdc*
- V 1 to 5 Vdc **
- C 4 to 20 mADC (Sinking)
- S 4 to 20 mADC (Sourcing)

*Requires E, I, or K for INPUT SIGNAL RANGE

** Requires V for INPUT SIGNAL RANGE

6 ZERO OFFSET

- N 0% Pressure Starts Below Atmosphere
- P 0% Pressure Starts Above Atmosphere
- Z 0% Pressure Starts at Zero (Typical)

7 ZERO OFFSET PRESSURE

Typical is 0* - If Greater than 30% of Full Scale Pressure (#9 below) Please Consult Factory.

*If Z for ZERO OFFSET (#6), please leave blank

8 FULL SCALE PRESSURE TYPE

- P 100% Pressure Ends Above Atmosphere

9 FULL SCALE PRESSURE

Must be less than or equal to 500 psig

*For maximum pressures less than 150 psig the QPV series may offer higher performance at lower cost

10 PRESSURE UNIT

- | | | | |
|----|------------|----|------------------------------|
| PS | PSI | IH | Inches Hg |
| MB | Millibars | IW | Inches H ₂ O |
| BR | Bar | MW | mm H ₂ O |
| KP | Kilopascal | KG | Kilograms/cm ² |
| MP | Megapascal | TR | Torr* |
| MH | mm Hg | CW | Centimeters H ₂ O |

*Requires A for PRESSURE UNIT OF MEASURE

11 PRESSURE UNIT OF MEASURE

- A Absolute Pressure
- G Gage Pressure

Please Consult Factory For More Options And Application Assistance

RECOMMENDED ACCESSORIES

- QBT-C-6 6 ft. Power Cable
- QBT-01 Wrap-Around Bracket
- QBT-02 Foot-Mount Bracket (Installed)*

TYPICALLY IN STOCK PARTS (most often available for faster shipment)

PART NUMBER	TYPE	MANIFOLD MATERIAL	CONNECTION	INPUT SIGNAL RANGE	MONITOR SIGNAL RANGE	FULL SCALE PRESSURE	AVAILABILITY
QB1SSNEEZP300PSG	Single Loop	Stainless Steel	1/8" NPT	0-10 Vdc	0-10 Vdc	0-300 psig	1-2 Days
QB1SSNEEZP500PSG	Single Loop	Stainless Steel	1/8" NPT	0-10 Vdc	0-10 Vdc	0-500 psig	1-2 Days

About Equilibar

Equilibar provides innovative and robust pressure control technology for researchers and engineers worldwide. We are proud to design, manufacture and test our patented back pressure regulators in our factory overlooking the Blue Ridge Mountains near Asheville, NC.

APPLICATION ENGINEERING— WHAT SETS US APART

Unlike mass-market regulator distributors, we focus on working with you, the scientist or engineer with a complex pressure control scenario.

Our application engineers work collaboratively with clients to identify the optimal model, trim, and diaphragm for each application's unique challenges. No matter where you are on the globe, you can stay in close contact with your engineer by email, telephone, videoconferencing or fax.

After installation, your application engineer will support you with start-up information and fine-tuning as needed.



Each application is reviewed by our engineering team to ensure quality performance of our products.



Our engineers offer custom designed solutions for the most difficult pressure control challenges. Feel free to contact us to discuss your situation.



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Made in the
USA

Equilibar's quality system is
ISO 9001:2015 certified.