

QL3 ELECTRO-PNEUMATIC PRESSURE REGULATOR

- The QL3 is a closed loop electronic pressure regulator consisting of two solenoid valves, an internal pressure transducer, and an electronic control circuit integrally mounted to an integrated volume booster.
- Uses a current driven variable orifice solenoid valve to avoid the pressure "steps" prevalent in most feed-and-bleed I/Ps.
- Features an analog PID circuit that integrates error out quickly, resulting in superior resolution.

SPECIFICATIONS

Electrical

Supply Voltage 15-24 VDC
 Supply Current 250 mA
 Command Signal.....0-10 VDC | 4-20 mA
 Command Signal Impedance
 VDC 10 K Ω
 Current 100 Ω

Analog Monitor Output

Voltage.....0-10 VDC @ 10 mA max
 Current.....4-20 mADC Sourcing
 (sinking optional)

Mechanical

Inlet Pressure.....0-125 PSIG
 Pressure Range.....0-110 PSIG
 Min pressure.....range 0-5 PSI
 Output Pressure0-100% of range
 Flow Rate.....SCFM
 Min Closed End Volume 5 in³
 Port Size1/4" NPT (BSPP opt)
 Filtration Recommended..... 40 micron
 Linearity< \pm 0.3% FS BFSL
 Hysteresis \pm 0.05% FS
 Repeatability \pm 0.2% FS
 Temperature effect1 per 25° C

Wetted Parts

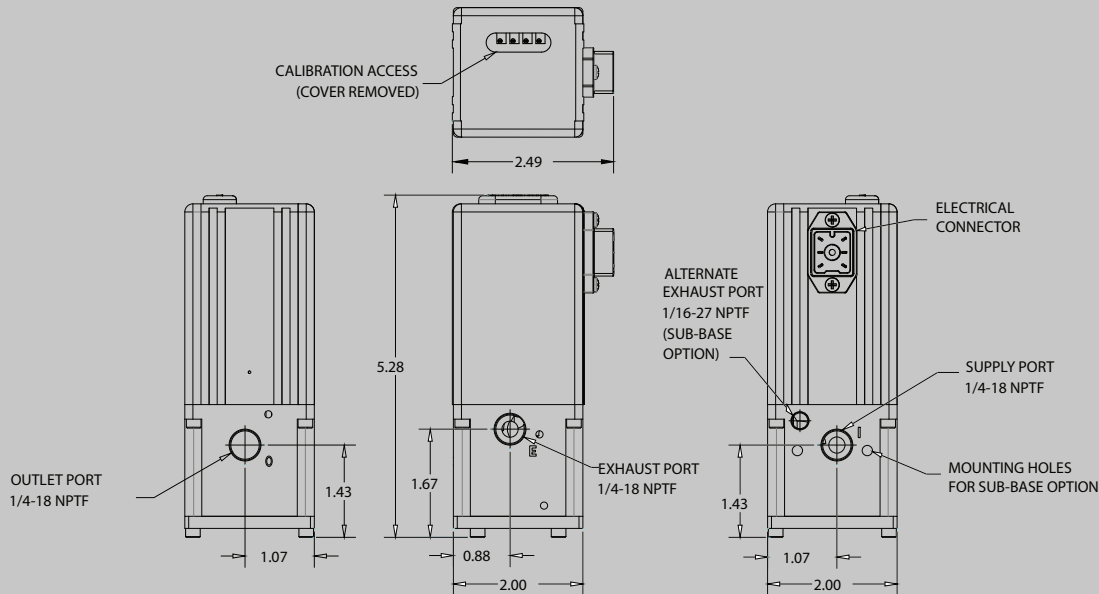
Elastomers†Buna-N
 Manifold.....Nickel-plated aluminum
 Valves430FR SS, 360 brass
 Seal Material.....Viton, Buna-N
 Pressure Transducer...Utem 1000, aluminum

Physical

Operating Temp.....32-158° F (0-70° C)
 Weight
 Brass 2.2 lbs (1.0 Kg)
 Aluminum 1.5 lbs (0.68 Kg)
 Housing.....Anodized Aluminum
 Connector.....6-pin Hirschmann

†Pressure ranges are customer-specified.
 Output pressures other than 100%
 available. ‡Others available.

QL3 PRESSURE REGULATOR



FREQUENTLY ASKED QUESTIONS

In what pressure ranges is the QL3 available?

The QL3 can be calibrated to a range from 1-150 PSI or or custom calibrated anywhere within that range. For pressure ranges between 121 and 500 psig, see the Proportion-Air QB3H series. We build our products to whatever pressure range our customer needs, some of our products (assemblies with volume boosters) can handle as high as 6,000 PSI. There is no additional cost for custom-calibrated pressure ranges.

What gases can the QL3 control?

The QL3 series controls these gases directly:

Air	Nitrogen
Argon	Nitrous Oxide
Carbon Dioxide	Oxygen – (O2 Clean option must be selected)
Compressed Air	

The QL3 series can pilot various volume boosters to control a wide range of fluids and media indirectly. Visit our website for more information.

With what units of measure can the QL3 be configured?

The QL3 full scale pressure range can be configured in any of the following units of measure:

PSI	Millimeters Hg
Millibars	Inches H ₂ O
Bar	Millimeters H ₂ O
Pascal	Centimeters H ₂ O
Kilopascal	Kilograms/cm ²
Megapascal	Torr – (Must be absolute reference unit)
Inches Hg	

Can the QL3 control vacuum?

No, the QL3 is not able to control vacuum. For vacuum control at similar pressure and flow needs, check out our **QB3** pressure regulator.

INSTALLATION WARNINGS

Before you get started, please read these warnings:

- Examine the product. Ensure that you received what you ordered.
- Read this guide first before you start and save it for later use.
- You must have a good understanding of what the adjustments are on this product before using them.
- All compressed air and power should be shut off before installing, removing or performing maintenance on this product.
- 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.

CONNECTION PROCEDURE

Pneumatic Connections

CAUTION: USE ONLY THE THREAD SEALANT PROVIDED. OTHER SEALANTS SUCH AS PTFE TAPE AND PTFE PASTE CAN MIGRATE INTO THE FLUID SYSTEM CAUSING FAILURES.

1. The valve can be mounted in any position without affecting performance. A variety of mounting brackets (See ordering info) can be used to attach valve to a panel or wall surface. Note: Very low pressure units work best when mounted upright.
2. A typical 40 micron in-line filter is recommended on the inlet of the QL3 valve. This is available from Proportion-Air as part number FPP-2.
3. A 1/16" plug is supplied with the valve. It can be used to plug the "Alternate Exhaust Port" if the exhaust media should be captured or when the valve is used for vacuum or vacuum through positive pressure control. (See Figure 1 for port location)

Positive Pressure Units

1. Connect supply pressure to the "I" port (Figure 1) not to exceed rated supply pressure. (See Table 1)
2. Connect the outlet "O" port (Figure 1) to the device being controlled.
3. The "E" exhaust port can be plumbed to a point outside the work area, fitted with a muffler or left open to atmosphere as the application dictates.
4. Proceed with electrical connection.

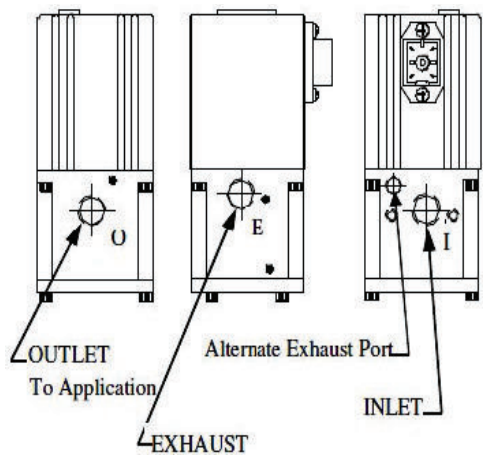
TABLE 1	
MAX. calibrated pressure:	Max. inlet pressure:
5 Through 10 PSIG (Positive)	15 PSIG (1 Bar)
10.1 up to 30 PSIG (0.70 up to 2 Bar)	35 PSIG (2.4 Bar)
31 up to 100 PSIG (2.1 up to 7 Bar)	110 PSIG (7.6 Bar)
101 up to 150 PSIG (7 up to 10.3 Bar)	165 PSIG (11.4 Bar)

Electrical Connections

1. Turn off all power before making electrical connections.
2. Identify the valve's command input and analog output using the calibration card included in the package and the ordering information section on the last page of this sheet.
3. Proceed to the appropriate section corresponding to the type of valve being installed.

NOTE: ALL COLOR CODES RELATE TO QL3'S ORDERED FROM THE FACTORY WITH PREASSEMBLED QBT-C-X CABLES.

FIGURE 1

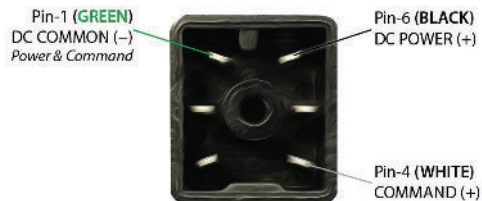


QL3 PRESSURE REGULATOR

COMMAND SIGNAL CONFIGURATIONS

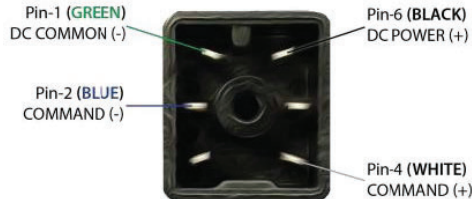
VOLTAGE COMMAND VALVES (E, K, V)

All voltage command QL3's use common mode voltage, meaning the DC Common pin (Pin-1) is the common reference for both power and command. Pin 1 is used as both the command signal common and power supply common. The following diagram shows the proper connections.



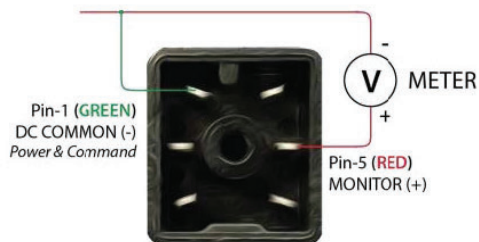
CURRENT COMMAND VALVES (I)

All current command QL3's use a differential current loop scheme (not isolated), meaning current flow is from Pin 4 to Pin 2 on the QB valve. Some applications may require the common of the power supply that provides loop power for the 4-20mA command to be tied to power supply common. The following diagram shows the correct connection for conventional current flow.

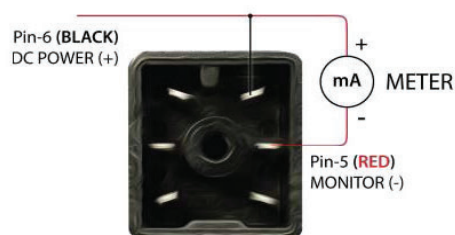


COMMAND SIGNAL CONFIGURATIONS

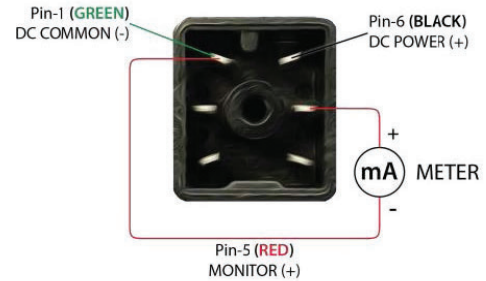
VOLTAGE COMMAND VALVES (E, K, V)



CURRENT Sinking Monitor (C)



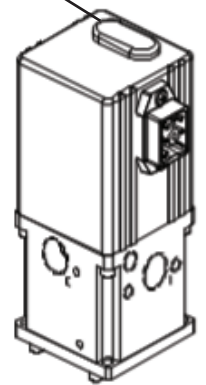
CURRENT Sourcing Monitor (S)



RE-CALIBRATION PROCEDURE:

All QL3 control valves come calibrated from the factory by trained personnel using precision calibration equipment. The QL3 valve is a closed loop control valve using a precision electronic pressure sensor. Typical drift is less than 1% over the life of the product. If your QL3 valve appears to be out of calibration by more than 1%, it is not likely to be the QL3. Check the system for plumbing leakage, wiring and electronic signal levels. Verify the accuracy of your measuring equipment before re-calibrating. Consult factory if you have any questions or require assistance.

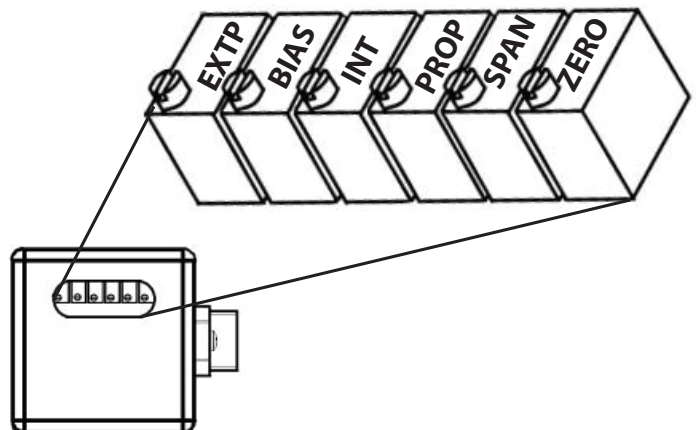
Calibration Access Cap



POTENTIOMETER IDENTIFIERS:

EXTP — Exhaust Trip Point
BIAS — Valve Bias Voltage
INT — Integral
PROP — Proportional
SPAN — Span Adjust
ZERO — Zero Adjust

NOTE: PID settings are factory set and should not require recalibration. If needed, please consult factory for adjustment procedures.



QL3 CONFIGURATION

SAFETY PRECAUTIONS

EXAMPLE			ACCURACY			PRESSURE			PORT SIZE			MAX FLOW					
QL3	3	A	N	E	E	Z		P	125	PS	G	02					
		1	2	3	4	5	6	7	8	9	10	OPTIONS					

Section Reference

1	Manifold Material
A	Nickel-Plated Aluminum
B	Nickel-Plated Brass (includes O2 cleaning)

2	Thread Type
N	NPT
P	BSPP

3	Input Signal Range	4	Output Signal Range
E	0 to 10 VDC	X	No Monitor
I	4 to 20 mA DC	E	0 to 10 VDC
K	0 to 5 VDC	K	0 to 5 VDC*
V	1 to 5 VDC*	V	1 to 5 VDC* ¹
A	RS232 Serial Input* ¹	C	4 to 20 mA DC (Sinking)
B	RS485 Serial Input* ¹	S	4 to 20 mA DC (Sourcing)
P	P2 Profiler (Integrated)	*Requires E, I or K for Input Signal Range (#3)	
*Requires V for Monitor Signal (#4)		*Requires V for Input Signal Range (#3)	
*Requires X for Monitor Signal (#4)			

5	Zero Offset
P	0% Pressure is Above Zero
Z	0% Pressure is Zero (Typical)

6	Zero Offset Pressure
Typical is 0° - If greater than 30% of full scale pressure (#8 below), please consult factory.	
*If Z for Zero Offset, Please Leave this Section (#6) Blank	

7	Full Scale Pressure Type
P	100% Pressure is Above Zero
Z	100% Pressure is Zero

8	Full Scale Pressure
Must be less than or equal to 125 psig	

09	Pressure Unit (no additional fee - all)		
PS	PSI	Inches Hg	IH
MB	Millibars	Inches H ₂ O	IW
BR	Bar	Millimeters H ₂ O	MW
KP	Kilo-pascal	Kilograms/cm ²	KG
MP	Mega-pascal	Torr (Requires A for Unit of Measure #11)	TR
MH	Millimeters Hg	Centimeters H ₂ O	CW
PA	Pascal		

10	Pressure Unit of Measure
G	Gauge Pressure

Recommended Accessories	
QBT-C-6	6 ft. Power/Command/Monitor Cable
QBT-01	Wrap-Around Mounting Bracket
QBT5-03	Foot-Mount Bracket (Installed)*
* Use Option BR for Foot-Mount Bracket	

Please read all of the following Safety Precautions before installing or operating any Proportion-Air, Inc. equipment or accessories. To confirm safety, be sure to observe 'ISO 4414: Pneumatic Fluid Power - General rules relating to systems' and other safety practices.



WARNING

Improper operation could result in serious injury to persons or loss of life!

1. PRODUCT COMPATIBILITY

Proportion-Air, Inc. products and accessories are for use in industrial pneumatic applications with compressed air media. The compatibility of the equipment is the responsibility of the end user. Product performance and safety are the responsibility of the person who determined the compatibility of the system. Also, this person is responsible for continuously reviewing the suitability of the products specified for the system, referencing the latest catalog, installation manual, Safety Precautions and all materials related to the product.

2. EMERGENCY SHUTOFF

Proportion-Air, Inc. products cannot be used as an emergency shutoff. A redundant safety system should be installed in the system to prevent serious injury or loss of life.

3. EXPLOSIVE ATMOSPHERES

Products and equipment should not be used where harmful, corrosive or explosive materials or gases are present. Unless certified, Proportion-Air, Inc. products cannot be used with flammable gases or in hazardous environments.

4. AIR QUALITY

Clean, dry air is not required for Proportion-Air, Inc. products. However, a 40 micron particulate filter is recommended to prevent solid contamination from entering the product.

5. TEMPERATURE

Products should be used with a media and ambient environment inside of the specified temperature range of 32°F to 158°F. Consult factory for expanded temperature ranges.

6. OPERATION

Only trained and certified personnel should operate electronic and pneumatic machinery and equipment. Electronics and pneumatics are very dangerous when handled incorrectly. All industry standard safety guidelines should be observed.

7. SERVICE AND MAINTENANCE

Service and maintenance of machinery and equipment should only be handled by trained and experienced operators. Inspection should only be performed after safety has been confirmed. Ensure all supply pressure has been exhausted and residual energy (compressed gas, springs, gravity, etc.) has been released in the entire system prior to removing equipment for service or maintenance.



CAUTION

Improper operation could result in serious injury to persons or damages to equipment!

1. PNEUMATIC CONNECTION

All pipes, pneumatic hose and tubing should be free of all contamination, debris and chips prior to installation. Flush pipes with compressed air to remove any loose particles.

2. THREAD SEALANT

To prevent product contamination, thread tape is not recommended. Instead, a non-migrating thread sealant is recommended for installation. Apply sealant a couple threads from the end of the pipe thread to prevent contamination.

3. ELECTRICAL CONNECTION

To prevent electronic damage, all electrical specifications should be reviewed and all electrical connections should be verified prior to operation.

EXEMPTION FROM LIABILITY

- Proportion-Air, Inc. is exempted from any damages resulting from any operations not contained within the catalogs and/or instruction manuals and operations outside the range of its product specifications.
- Proportion-Air, Inc. is exempted from any damage or loss whatsoever caused by malfunctions of its products when combined with other devices or software.
- Proportion-Air, Inc. and its employees shall be exempted from any damage or loss resulting from earthquakes, fire, third person actions, accidents, intentional or unintentional operator error, product misapplication or irregular operating conditions.
- Proportion-Air, Inc. and its employees shall be exempted from any damage or loss, either direct or indirect, including consequential damage or loss, claims, proceedings, demands, costs, expenses, judgments, awards, loss of profits or loss of chance and any other liability whatsoever including legal expenses and costs, which may be suffered or incurred, whether in tort (including negligence), contract, breach of statutory duty, equity or otherwise.

WARRANTY

Proportion-Air, Inc. products are warranted to the original purchaser only against defects in material or workmanship for 18 months from the date of manufacture. The extent of Proportion-Air's liability under this warranty is limited to repair or replacement of the defective unit at Proportion-Air's option. Proportion-Air shall have no liability under this warranty where improper installation or filtration occurred.