

# PROPORTIONAIR

THE FUTURE OF CONTROL™



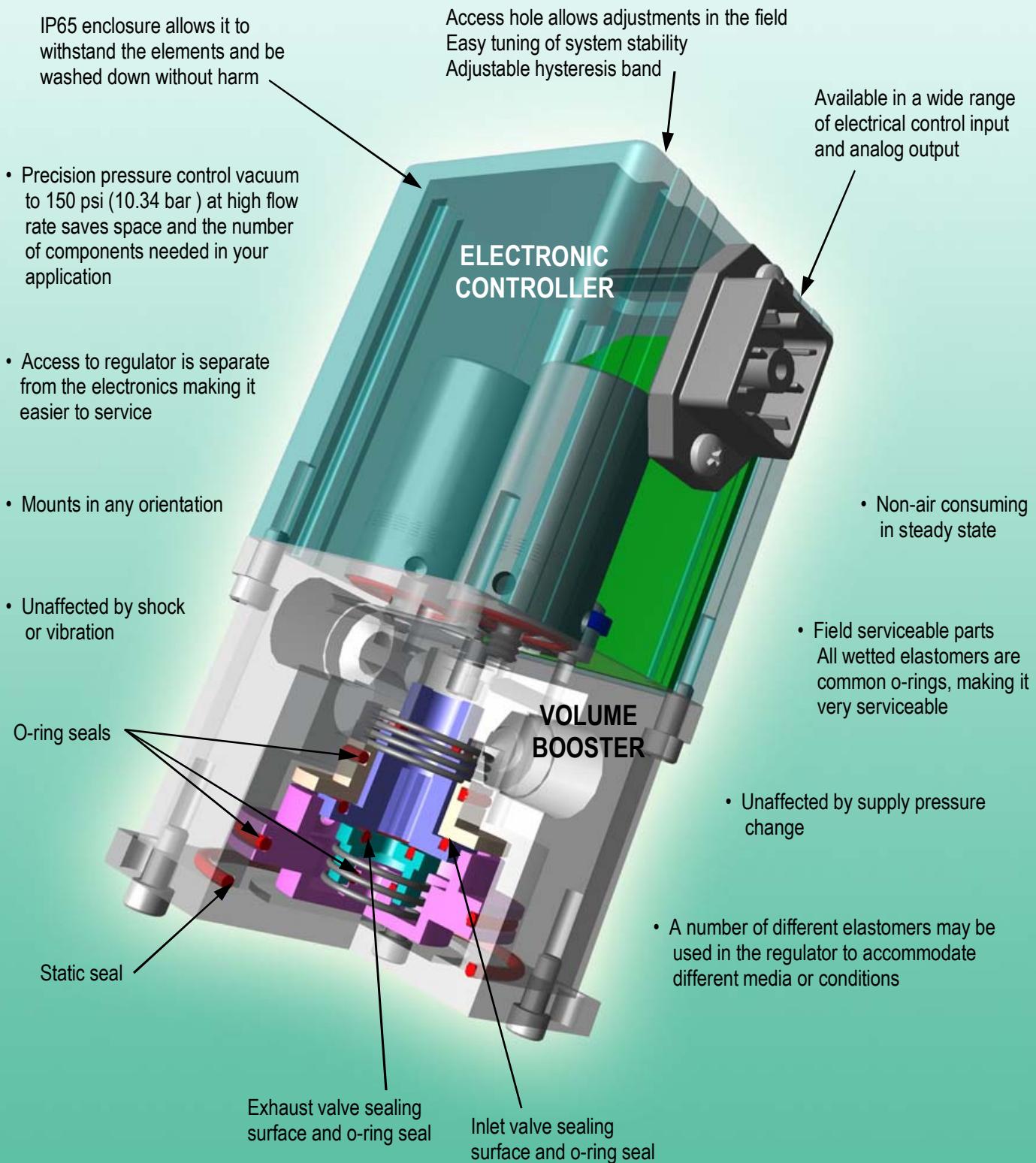
## QB3

### ELECTRO-PNEUMATIC REGULATOR

- \* Precise Closed Loop Control
- \* Accuracy +/-0.25% F.S.
- \* High Forward and Relief Flow Rates up to 40 SCFM
- \* Control Pressure Ranges from Vacuum to 150 psig
- \* Single Valve or Manifold Mount Options

Actual size  
shown with  
optional  
digital display

## THE INSIDE STORY OF THE QB3:



## FUNCTIONAL DESCRIPTION

The QB3 is a closed loop pressure regulator consisting of two solenoid valves, an internal pressure transducer, and electronic controls all integrally mounted to our unique volume booster.

### THEORY OF OPERATION

The output or "work" pressure is proportional to an electrical input or "command signal". The pressure is controlled by activating the solenoid valves, which control the pressure in the "pilot" side of the booster. One valve functions as inlet control, the other as exhaust.

The output pressure is measured by a pressure transducer, that senses pressure in the work port of the QB3 and provides a feedback signal to the electronic control circuit. This feedback signal is compared to the command signal input. Any differences between the command signal and the actual pressure feedback signal causes one of the solenoid valves to open to adjust the pressure in the "pilot" side of the booster. Pilot pressure is adjusted so that desired down stream operating pressure is achieved and maintained.

Any mechanical hysteresis of the volume booster is automatically compensated for since it is the actual desired work pressure that is being sensed and fed back to the control circuit. This allows for our extraordinary accuracy and repeatability.

### COMMAND SIGNAL

Command inputs come in a choice of either a differential 0-10Vdc or 4-20mA.

### MONITOR SIGNAL

All QB3's come with a 0-10 volt or optional 4-20mA monitor signal, for output to a panel meter or controller for data acquisition or quality assurance needs. The monitor signal represents the internal pressure transducer that is measuring the work pressure.

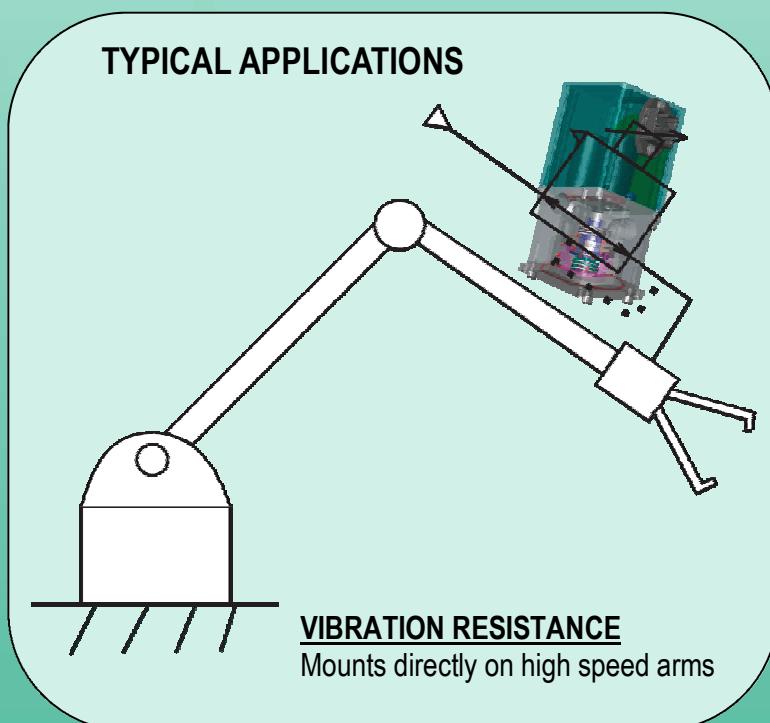
Providing this monitor signal as part of our standard package eliminates the need for the customer to purchase a separate transducer since the signal is a true depiction of downstream pressure.

### INTEGRAL REGULATOR

The uniqueness of the booster design is that it has no stamped gaskets or special molded diaphragm or seal parts. All of the parts related to normal maintenance are standard o-rings.

Complete repair kits are available, but in case emergency repair is needed parts could be available from any fluid power distributor or even most neighborhood hardware stores. A large number of chemical resistant o-rings are available to meet

your requirements. You can select the compounds which are most ideally suited to your process and environment.



## QB3 GENERAL SPECIFICATIONS & PERFORMANCE CHARACTERISTICS

| ELECTRICAL                               | MINIMUM  | TYPICAL | MAXIMUM  |
|--|----------|---------|----------|
| Supply Voltage                           | 15VDC    | -       | 24VDC    |
| Supply Current                           | 100mA DC | -       | 250mA DC |
| Command Signal Voltage                   | 0VDC     | -       | 10VDC    |
| Command Signal Current                   | 4mA DC   | -       | 20mA DC  |
| Analog Monitor Output Voltage            | 0VDC     | -       | 10VDC    |
| Analog Monitor Output Current (Sourcing) | 4mA DC   | -       | 20mA DC  |
| Command Signal Impedance Voltage         | -        | 10 KΩ   | -        |
| Command Signal Impedance Current         | -        | 100 Ω   | -        |

| PNEUMATIC           | MINIMUM            | TYPICAL   | MAXIMUM                  |
|---------------------|--------------------|---|--------------------------|
| Inlet Pressure      | Full Vacuum        | 110% of full scale calibration  | 165 psig (11.37 bar)     |
| Pressure Range      | Full Vacuum        | -   | 150 psig (10.34 bar) (1) |
| Flow Rate           | -                  | See Flow Graphs (pg 5)  | -                        |
| Filtration Required | 40 micron (actual) | 20 micron   | -                        |
| Accuracy (Pressure) | ±0.5% F.S.         | ±0.25% F.S.   | ±0.1% F.S.               |
| Accuracy (Monitor)  | ±0.5% F.S.         | ±0.3% F.S.  | -                        |
| Hysteresis          | ±0.5% F.S. (2)     | ±0.2% F.S.  | 0% F.S.                  |
| Port Size (all)     | -                  | 1/4 inch NPT Female   | -                        |
| Critical Volume     | -                  | 3 in³ (3)   | -                        |
| Wetted Parts        |                    | Elastomers - Buna N (4)<br>Manifold - Aluminum Nickel Plated<br>Valves - 430FR SS, 360 Brass<br>Seal material: Viton & Buna-N<br>P.Transducer - Utem 1000, Aluminum |                          |

| PHYSICAL               | MINIMUM    | TYPICAL                  | MAXIMUM      |
|------------------------|------------|--------------------------|--------------|
| Operating Temperature  | 32°F (0°C) | -                        | 158°F (70°C) |
| Environment Protection | -          | NEMA 4/IP65 (5)          | -            |
| Weight                 | -          | 1.1 lbs (.5 kg)          | -            |
| Electrical Connector   | -          | 6 pin Hirshman Connector | -            |

(1) Pressure ranges are customer specified.

(2) User adjustable

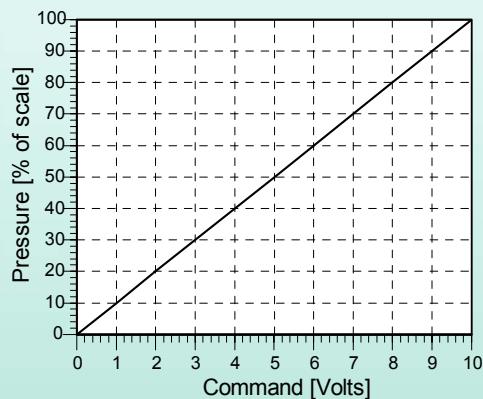
(3) The minimum downstream closed volume is determined by the pressure range, orifice size, hysteresis window, plumbing, as well as other factors. Consult factory for small volume applications.

(4) Other elastomers are available. Consult factory.

(5) CE approved

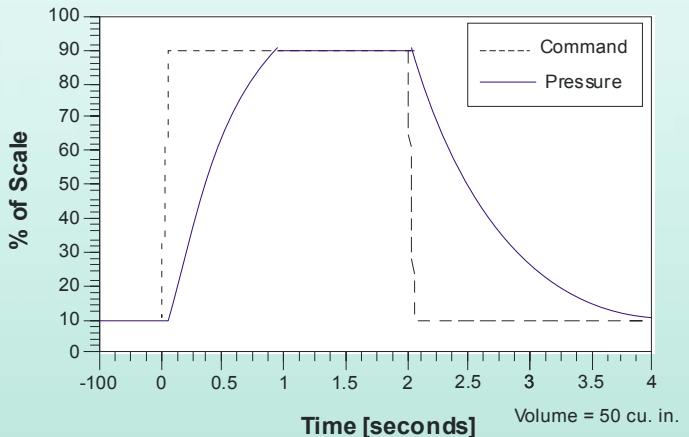
## PERFORMANCE CHARACTERISTICS

### LINEARITY



This chart shows the linear characteristics of QB3 products when given a ramp signal from 0-10 volts. Characteristics would be similar for 4-20 mA units.

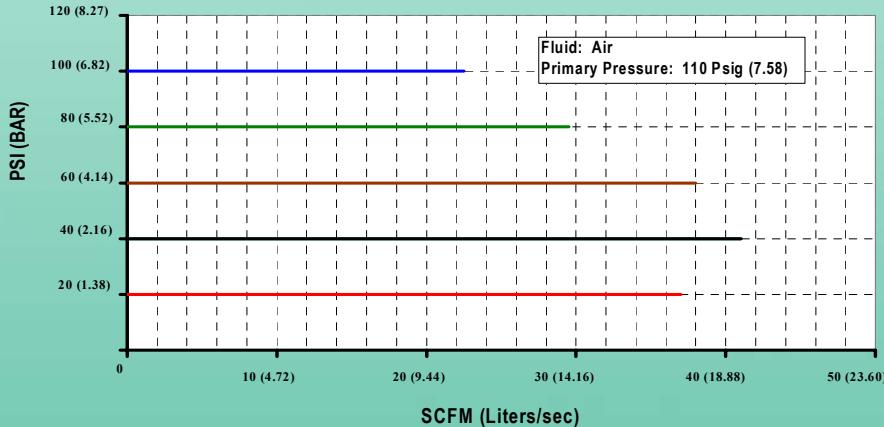
### RESPONSE TO STEP INPUT



Times for QB3 to fill/exhaust a closed chamber. Step command signal is superimposed over pressure trace. Time is determined by difference between command signal and pressure achieved.

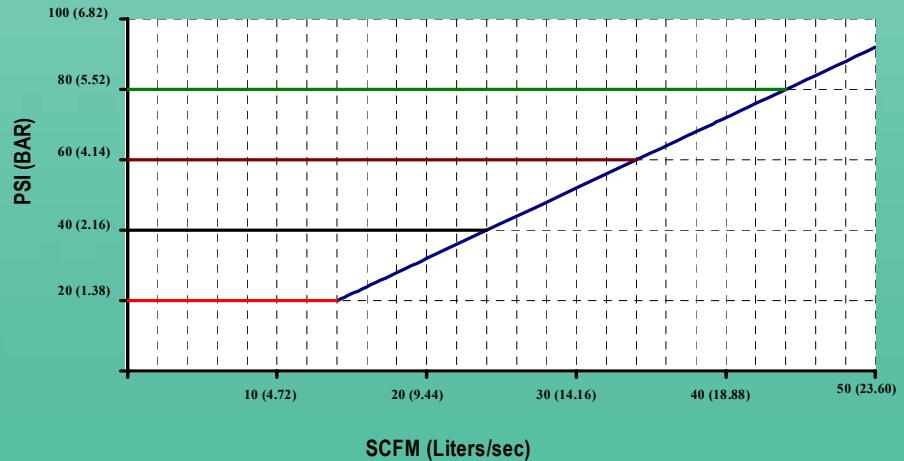
## FLOW CHARACTERISTICS

### QB3 Forward Flow



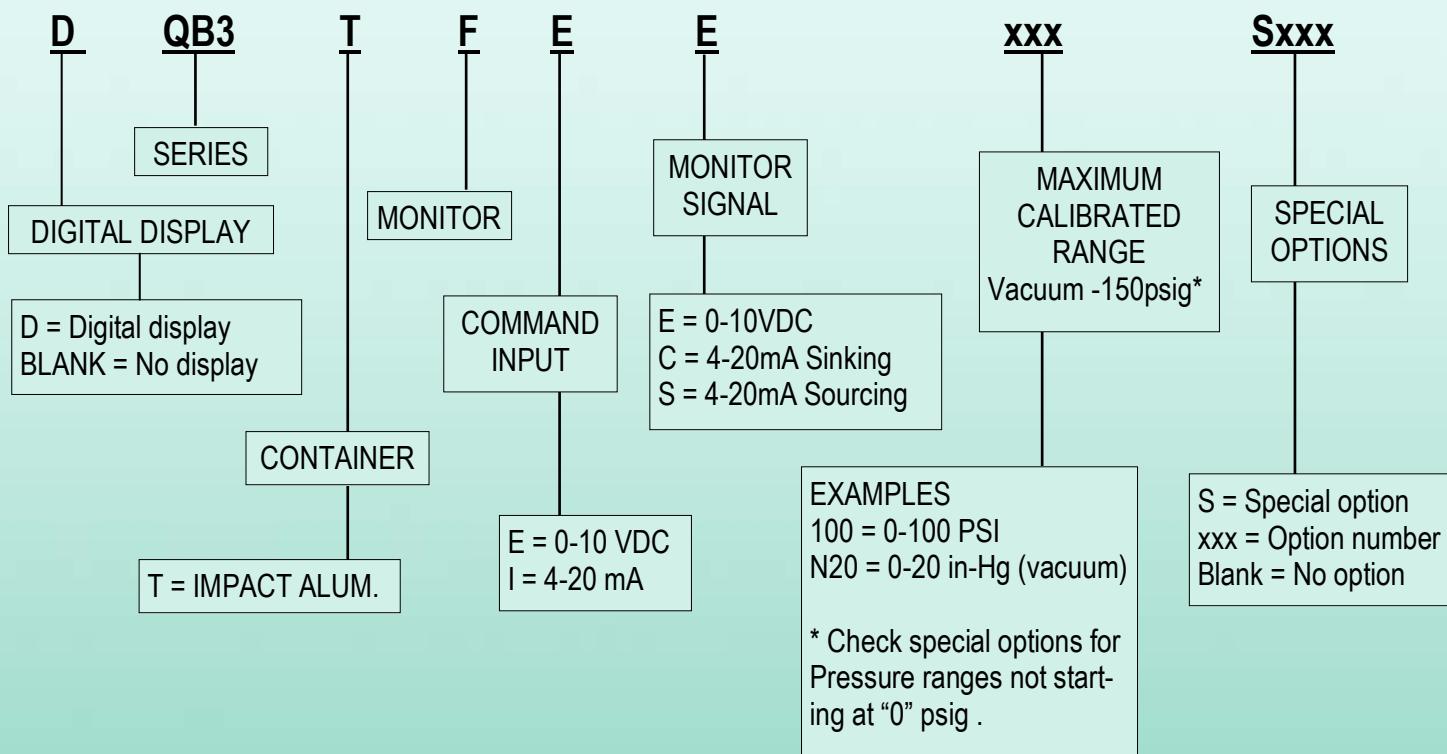
QB3 flow characteristics from no flow to full flow conditions. Consult factory for sub-base assembly flow characteristics.

### QB3 Relief Flow



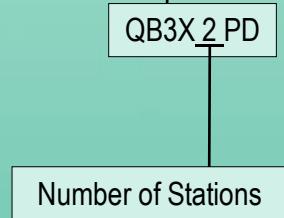
QB3 flow characteristics from full flow to no flow conditions. Consult factory for sub-base assembly flow characteristics.

## ORDERING INFORMATION



## ACCESSORIES

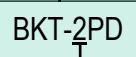
### SUB-BASE MANIFOLD



### MOUNTING BRACKETS



Bracket for Single Valve



Number of Stations

### PRE-ASSEMBLED POWER CORD



SUB-BASE Manifold Bracket

Length in feet

(Other lengths are available from 1 to 25 feet, in 1 foot increment)

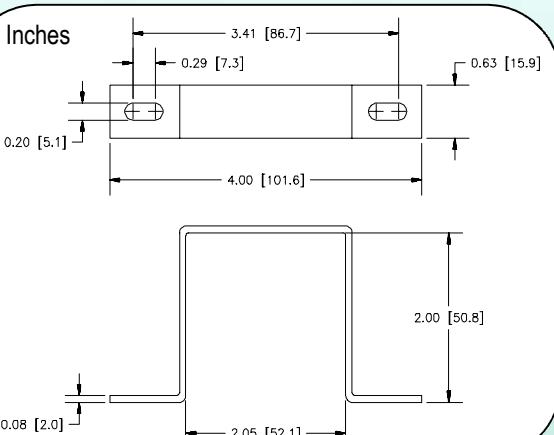
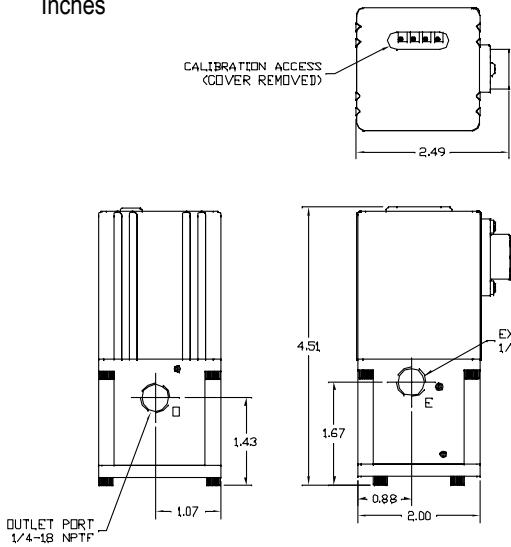
## QBT-01 MOUNTING BRACKET

### DIMENSIONS QB3

DIMENSIONS ARE FOR REFERENCE USE ONLY

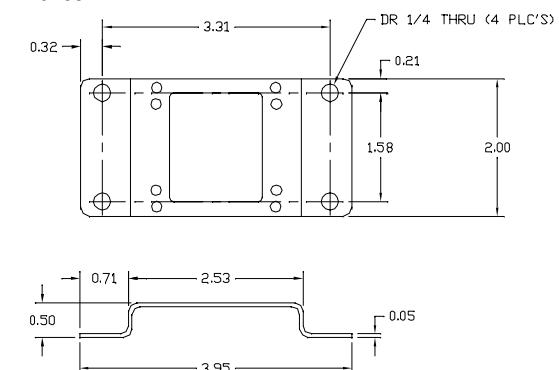
### SINGLE VALVE QB3

Inches



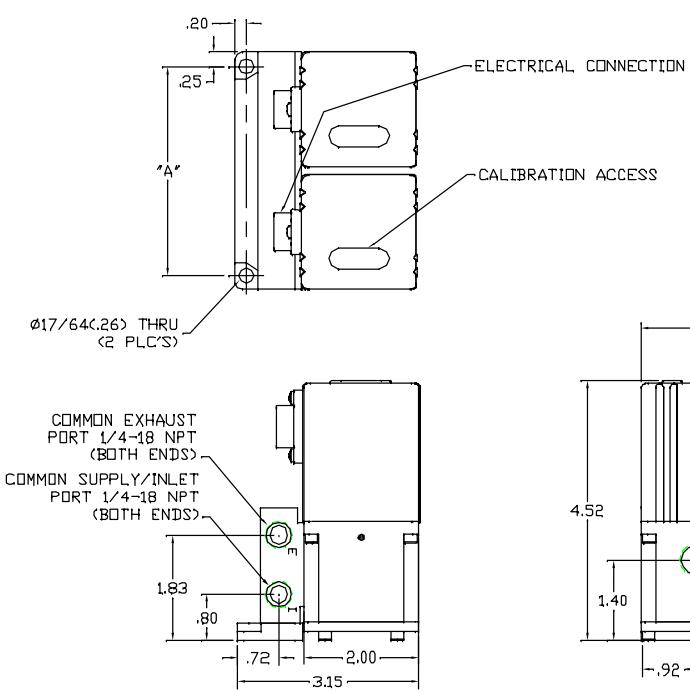
## QBT-02 MOUNTING BRACKET

Inches

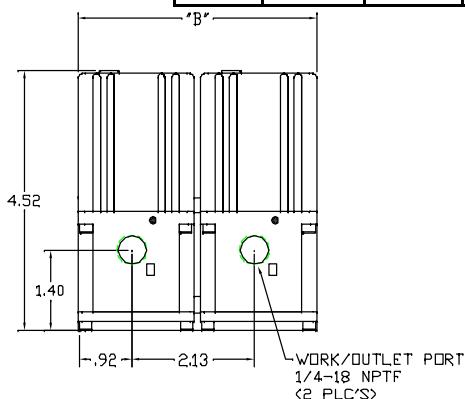


### MANIFOLD MOUNT QB3

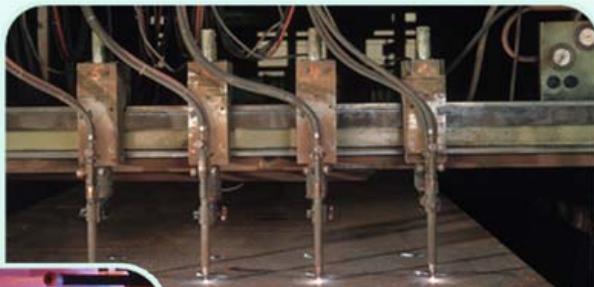
Inches



| Station | DIM "A" | DIM "B" | Weight  |
|---------|---------|---------|---------|
| 2       | 3.63    | 4.13    | 2.6lbs. |
| 3       | 5.75    | 6.25    | 3.9lbs. |
| 4       | 7.88    | 8.38    | 5.4lbs. |
| 5       | 10.00   | 10.50   | 6.5lbs. |
| 6       | 12.13   | 12.63   | 7.8lbs. |



Proportion-Air offers you the technical knowledge, expertise and capabilities that have developed concepts into the foremost control products in operation around the world.



**PROPORTION-AIR, INC. 8250 N. 600 West, P.O. BOX 218  
McCORMICKSVILLE, INDIANA USA 46055  
PHONE 317-335-2602 FAX 317-335-3853  
[www.proportionair.com](http://www.proportionair.com) [info@proportionair.com](mailto:info@proportionair.com)**

## **WE MAKE ONE PRODUCT THOUSANDS OF WAYS**

Proportion-Air 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 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.

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**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.