

## QPV2 INSTALLATION & MAINTENANCE INSTRUCTIONS

### DESCRIPTION / IDENTIFICATION

The QPV2 series valve uses Proportion- Air closed loop technology for pressure control. It gives an output pressure or flow proportional to an electrical command signal input. The QPV2 is a complete closed loop control valve consisting of valves, manifold, housing and electronic controls. Pressure or flow is controlled by the use of two solenoid valves. One valve functions as inlet control, the other as exhaust. The inlet solenoid valve operates proportionally to the voltage supplied by the control circuit. This variable orifice effect allows precise control of pressure or flow and avoids the digital steps of traditional ON/OFF solenoids. The exhaust solenoid is a standard ON/OFF solenoid and allows excess media to be vented from the system when command signal is less than the feedback.

The QPV2 receives a feedback signal (0-10Vdc standard) from an external sensing device. The external signal is compared to the command signal. A difference between the command and the feedback causes one of the two solenoid valves to open, allowing pressure in or out of the system.

Since the feedback is an electrical signal, many types of sensors may be used as feedback such as pressure, force, position, flow, etc.

QPV2 primary monitor output is a signal from the external sensing device that is connected to the QPV2. A 0-10Vdc (0-5Vdc or 4-20mA optional) output is standard and can be used for data acquisition or taken to a panel meter for display.

A second monitor signal is available from the onboard pressure sensor.

### INSTALLATION

1. Apply a small amount of anaerobic sealant (provided) to the male threads of the in-line filter supplied with valve.

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

2. Install the in-line filter into the port labeled IN on QPV2 valve.
3. Connect supply line to the in-line filter port. See TABLE 1 for rated inlet pressure.
2. Connect device being controlled to port labeled OUT on QPV2 valve.
3. The valve can be mounted in any position without affecting performance. Mounting bracket QBT-01 (ordered separately) can be used to attach valve to a panel or wall surface.
4. Proceed with electrical connections.

### Vacuum Only Units

1. Apply a small amount of anaerobic sealant (provided) to the male threads of the in-line filter supplied with valve.
2. Connect vacuum supply to the "1/8" nipple in the exhaust port (figure 1).
3. Leave inlet "IN" port (figure 1) open to atmosphere.
4. Connect the outlet "OUT" port (figure 1) to the device being controlled.
5. Proceed with electrical connection.

### SPECIFICATIONS

#### ELECTRICAL

SUPPLY VOLTAGE.....	15-24 VDC
SUPPLY CURRENT.....	350mA req'd.
COMMAND SIGNAL	
VOLTAGE.....	0-10 VDC
CURRENT.....	4-20mA
COMMAND SIGNAL IMPEDANCE	
VOLTAGE.....	10 KΩ
CURRENT.....	100 Ω
ANALOG MONITOR SIGNAL	
VOLTAGE.....	0-10 VDC @ 10mA max
CURRENT.....	4-20mADC @ 11 VDC max

#### MECHANICAL

PRESSURE RANGES.....	29.9 in. Hg (vac) - 100 psig (760 mmHg (vac) - 6.89 BAR)
FLOW RATE.....	Based on the inlet valve orifice size (ORDERING INFORMATION)
Cv CAPACITY.....	Factory Determined, based on applications specs.
FILTRATION RECOMMENDED.....	20 micron nominal (included)
LINEARITY/HYSTERESIS.....	<±0.15% F.S. BFSL
REPEATABILITY.....	<±0.02% F.S.
ACCURACY.....	<±0.2% F.S.
RESOLUTION.....	<±0.02% F.S.
WETTED PARTS <sup>1</sup> .....	Elastomers - Fluorocarbon Manifold - Brass Valves - Nickel plate brass P.Transducer - Silicon, Aluminum

<sup>1</sup> Others available

#### PHYSICAL

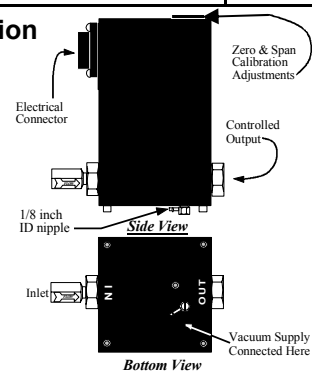
OPERATING TEMPERATURE.....	32-158°F [0-70°C]
WEIGHT.....	1.02 lb [0.50 Kg]
PROTECTION RATING.....	NEMA 4
HOUSING.....	Aluminum
FINISH.....	Black Anodized

**TABLE 1**

RATED INLET PRESSURE FOR STANDARD QPV2 VALVES

For valves ordered with MAX. calibrated pressure	MAX. inlet pressure
Vacuum up to 10 psig (0.69 bar)	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)

### Vacuum Installation



(Figure 1)

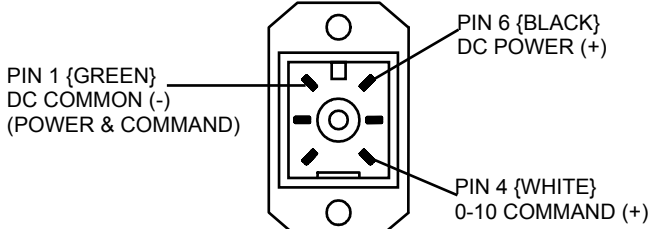
**ELECTRICAL CONNECTIONS**

1. Turn off all power to valve.
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 THE FACTORY WIRED QBT POWER CORD.**

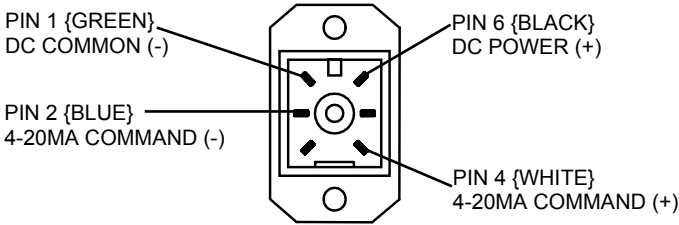
**Voltage Command Valves**

All voltage command QPV2's use single ended 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 (TFIE)**

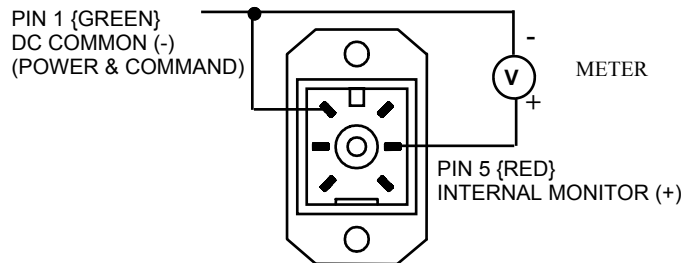
All current command QPV2's use a differential current loop scheme (not isolated), meaning current flow is from Pin 4 to Pin 2 on the QB valve. Some applications may require the common of the power supply that provides loop power for the 4-20mA command to be tied to power supply common. The following diagram shows the correct connection for conventional current flow.



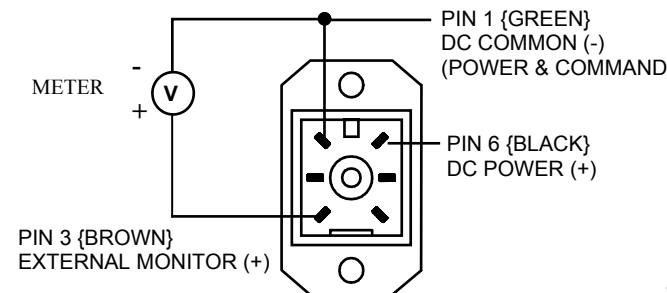
**Voltage Monitor**

Use the following wiring diagram for QPV2 with a voltage monitor output.

**Monitoring the internal sensor**

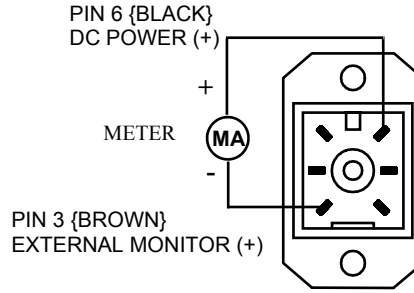


**Monitoring the external sensor**



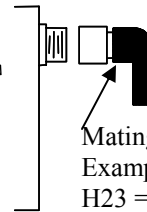
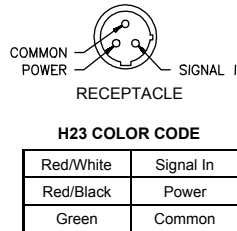
**Current Monitor (TFEC or TFIC)**

Use the following wiring diagram for QPV2 valves with a current sinking external sensor monitor output.



**QPV2 EXTERNAL LOOP CONNECTIONS**

All QPV2 valves are designed to accept a 0-10 volt or 0-5Vdc (S50 option) external loop input signal which is plugged into auxiliary receptacle on opposite side of the QB. Reference the following wiring diagrams for details.



Mating Cords are available.  
Examples:  
H23 = 3 FT  
H24 = 6 FT  
H236 = 6 FT shielded  
Consult factory for other length.

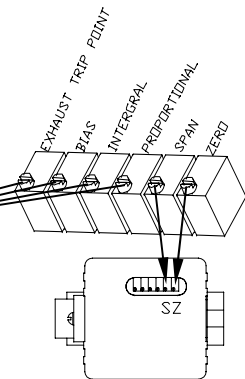
**RE-CALIBRATION PROCEDURE**

All QPV2 control valves come calibrated from the factory by trained personnel using precision calibration equipment. The QPV2 valve receives a feedback from an external sensing device. Since the external signal is the primary feedback to the QPV2, no calibration is required to the QPV2. If your QPV2 valve appears to be out of calibration, it is not likely to be the QPV2. Check the external sensing device, the system for adequate supply pressure, wiring and electronic signal levels. Consult factory if you have any questions or require assistance.

**NOTE: The QPV2 uses an advanced analog PID circuit to modulate the internal solenoid valves. These four potentiometers (Proportional, Integral, Bias and Exhaust Trip Point) are set at the factory and should not require adjustment. These settings are based on the specific parameters of your application. If the response of the QPV2 requires adjustment, contact the factory for special instructions.**

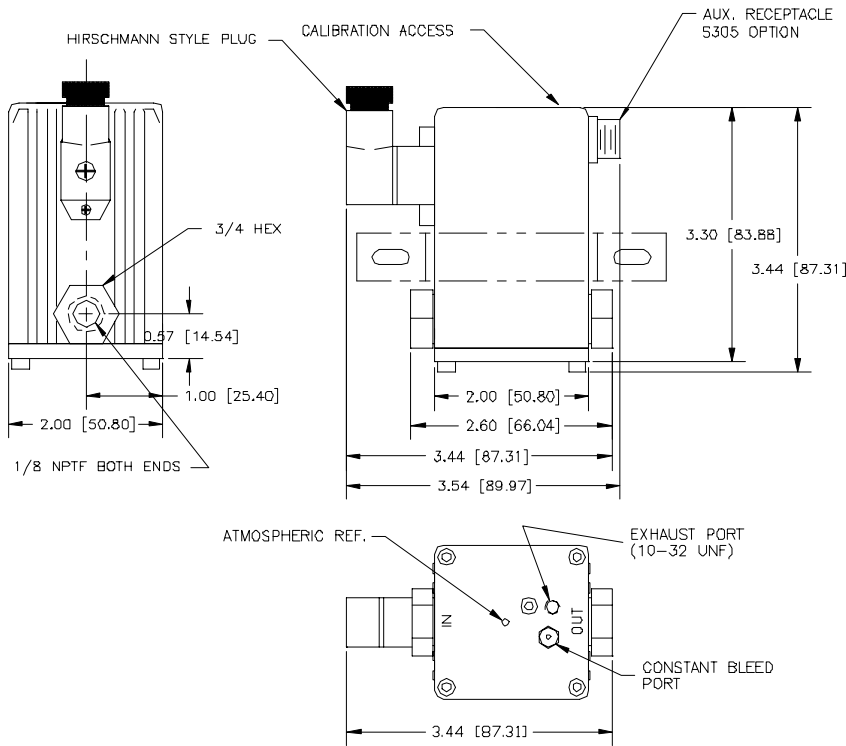
**PID SETTING**

Should not require adjustment. Set at the factory based on specific parameters of your Application.

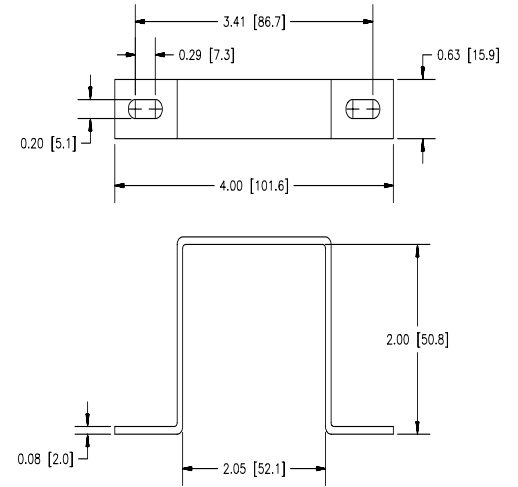


**Figure 1**

**DIMENSIONS in [mm]**  
**QPV2 CONTROL VALVE**

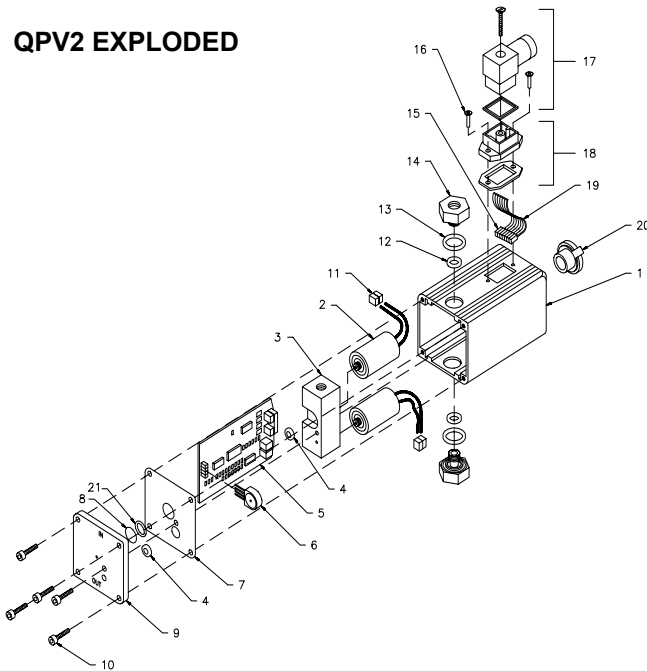


**MOUNTING BRACKET**



**REPLACEMENT PARTS**

**QPV2 EXPLODED**



**PARTS LIST**

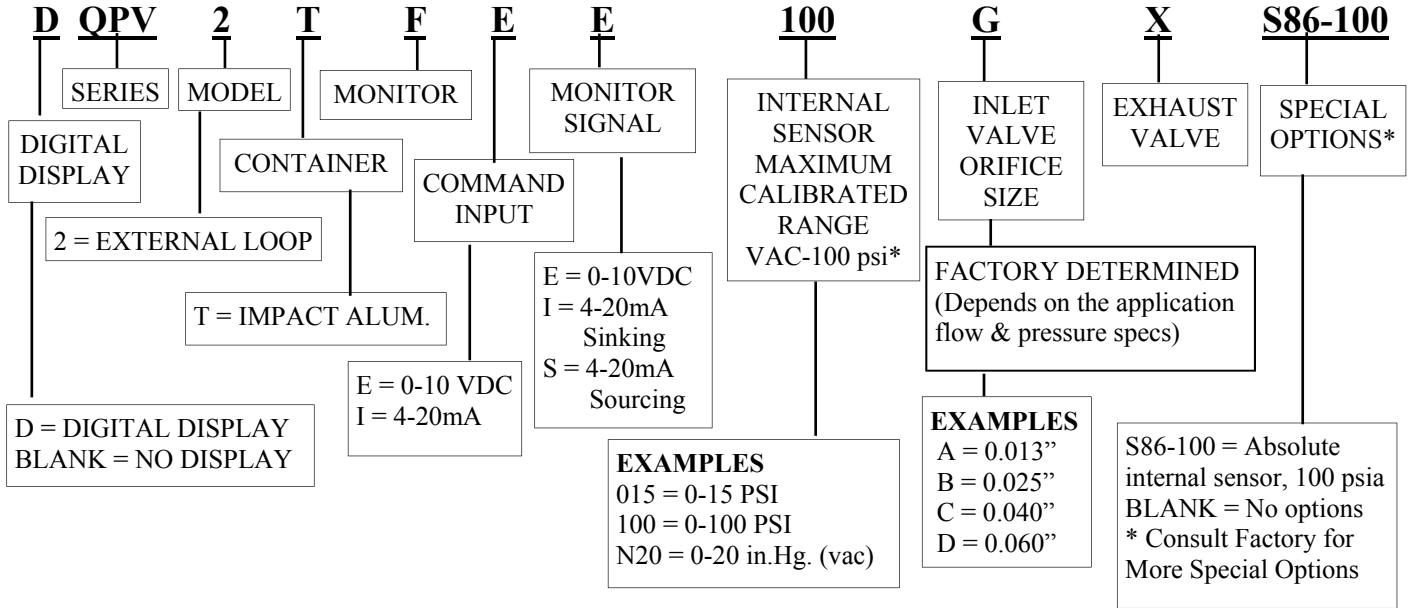
1. Housing
2. Valve (2)  
Inlet: Proportional  
Exhaust: Digital ON/OFF
3. Manifold
4. O-ring (2)
5. Electronic board
6. Sensor
7. Gasket
8. Filter/Breather
9. Lid
10. Screw (5)
11. Connector (2)
12. O-ring (2)
13. O-ring (2)
14. Fitting (2)
15. Connector
16. Screw (2)
17. Connector assembly
18. Receptacle assembly
19. Wire harness
20. Cap
21. O-ring

**PART NUMBERS FOR  
REPLACEMENT ITEMS\***

2. Consult factory
4. H134
6. Consult factory
7. H1054
10. H1049
12. H2014
13. H011
14. H1048
17. H615
20. H368
21. H040

\* Include complete QPV2 part number & any modification numbers when ordering replacement parts

## ORDERING INFORMATION



### PID SETTING

C<sub>x</sub>

**REQUIRED FOR ALL QPV VALVES**  
Factory determined based on the specifications of the application

### MOUNTING BRACKET

QBT-01

### PRE-ASSEMBLED POWER CORD

QBT-C-6

Length in feet (Other lengths are available from 1 to 25 feet)

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.

All specifications are subject to change without notice. **THIS WARRANTY IS GIVEN IN LIEU OF, AND BUYER HEREBY EXPRESSLY WAIVES, WARRANTIES OR LIABILITIES, EXPRESSED, IMPLIED OR STATUTORY, INCLUDING WITHOUT LIMITATION ANY OBLIGATION OF PROPORTION-AIR 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.

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