

PROPORTION-AIR

QPV1

INSTALLATION & MAINTENANCE INSTRUCTIONS

DESCRIPTION / IDENTIFICATION

The QPV1 series valve uses Proportion- Air closed loop technology for pressure control. It gives an output pressure proportional to an electrical command signal input.

The QPV1 is a complete closed loop control valve consisting of valves, manifold, housing and electronic controls.

Pressure 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 at low flow conditions 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.

The pressure output is measured by a pressure transducer internal to the QPV1 and provides a feedback signal to the electronic controls. This feedback signal is compared with the command signal input. A difference between the two signals causes one of the solenoid valves to open, allowing flow in or out of the system. Accurate pressure is maintained by controlling these two valves.

A monitor output is provided for the system measurement. All QPV1 valves come standard with an analog voltage monitor output. QPV1 monitor output is an amplified signal from the internal pressure transducer.

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 QPV1 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 QPV1 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
COMMAND SIGNAL IMPEDANCE	
VOLTAGE.....	10 KΩ
ANALOG MONITOR SIGNAL	
VOLTAGE.....	0-10 VDC @ 10mA max

MECHANICAL

PRESSURE RANGES.....	29.9 in. Hg (vac) - 150 psig (760 mmHg (vac) - 10.34 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'	Elastomers - Fluorocarbon Manifold - Brass Valves - Nickel plate brass P. Transducer - Silicon, Aluminum

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

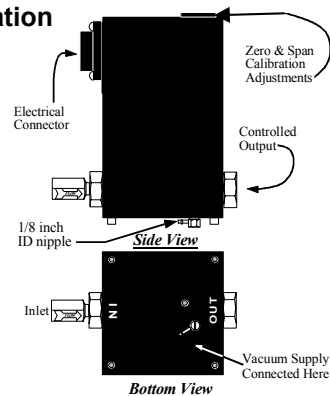
¹ Others available

TABLE 1

RATED INLET PRESSURE FOR STANDARD QPV1 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)
101 up to 150 psig (6.96 up to 10.34)	160 psig ()

Vacuum Installation



(Figure 1)

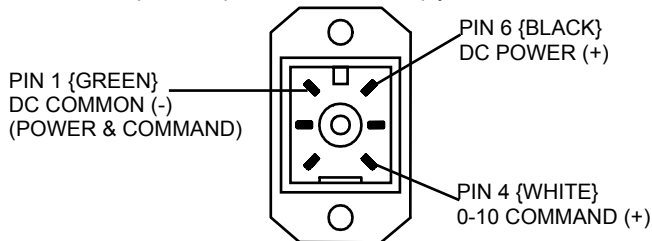
ELECTRICAL CONNECTIONS

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.

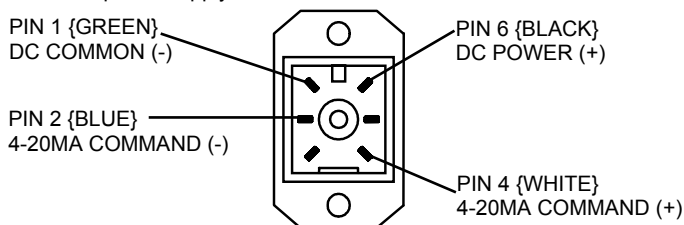
Voltage Command Valves (TFE)

All voltage command QPV1'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.

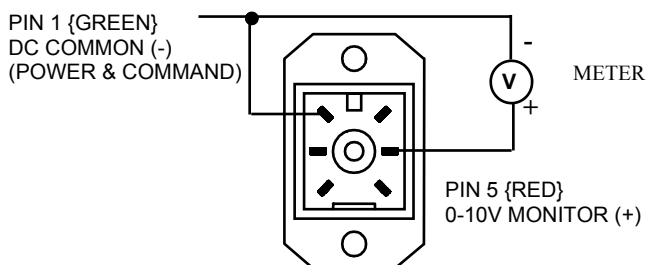


Current Command Valves (TFI)

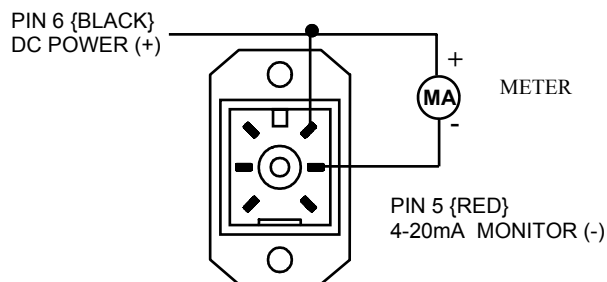
All current command QPV1's use a differential current loop scheme (not isolated), meaning current flow is from Pin 4 to Pin 2 on the QB valve. Some applications may require the common of the power supply that provides loop power for the 4-20mA command to be tied to power supply common.



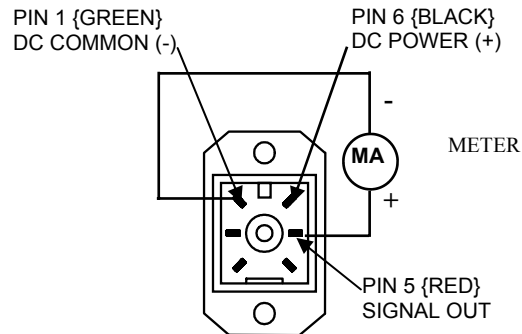
Voltage Monitor (TFIE or TFEF)



Current Sinking Monitor (TFEC or TFIC)



Current Sourcing Monitor (TFES or TFIS)



RE-CALIBRATION PROCEDURE

All QPV1 control valves come calibrated from the factory by trained personnel using precision calibration equipment. The QPV1 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 QPV1 valve appears to be out of calibration by more than 1%, it is not likely to be the QPV1. Check the system for adequate supply pressure, 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. If the QPV1 valve needs re-calibration, use the procedure described below:

QPV1 VALVES

1. Identify the inputs and outputs of the valve using the model number of the valve, calibration card included with the valve, and the information provided in this sheet.
2. Connect a precision measuring gage or pressure transducer to the OUT port of the QPV1.
3. Connect the correct supply source to the IN port of the QPV1, making sure the pressure does not exceed the rating for the valve (See Table 1).
4. Locate the plastic calibration access cap on top of the QPV1 valve and completely remove it. Located underneath are two adjustment trimpots, Zero "Z" and Span "S". See figure 1 for pots location.

NOTE: The QPV1 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 QPV1 requires adjustment, contact the factory for special instructions.
5. NOTE: Only use this step if your device is totally out of calibration. If it is slightly out of calibration, omit this step and move on to paragraph 6. Using a small screwdriver, turn both trimpots 15 turns clockwise. Then turn both trimpots 7 turns counterclockwise. This will put the QPV1 roughly at mid-scale.
6. Make correct electrical connections as noted. Make sure there is a proper meter in place to measure the command input to the QPV1.
7. Set the electrical command input to MAXIMUM value.
8. Adjust the SPAN pot until MAXIMUM desired pressure is reached (clockwise *increases* pressure).
9. Set the electrical command input to MINIMUM value.
10. Adjust the ZERO pot until MINIMUM desired pressure is reached (clockwise *increases* pressure).
11. Repeat ZERO and SPAN adjustments, which interact slightly, until QPV1 valve is calibrated back to proper range. Step 7 - 10.
12. Replace calibration access cap.

RE-CALIBRATION PROCEDURE (Continued)

12. Set the electrical command input to MAXIMUM value.
13. Adjust the SPAN pot until MAXIMUM desired pressure is reached (clockwise *increases* pressure).
14. Set the electrical command input to MINIMUM value.
15. Adjust the ZERO pot until MINIMUM desired pressure is reached (clockwise *increases* pressure).
16. Repeat ZERO and SPAN adjustments, which interact slightly, until QPV1 valve is calibrated back to proper range. Step 7 - 10.
17. Replace calibration access cap.

PID SETTING

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

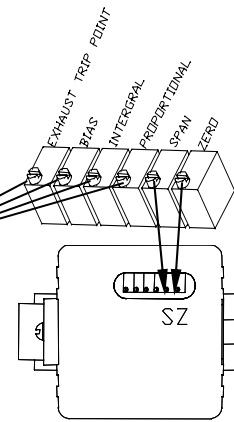
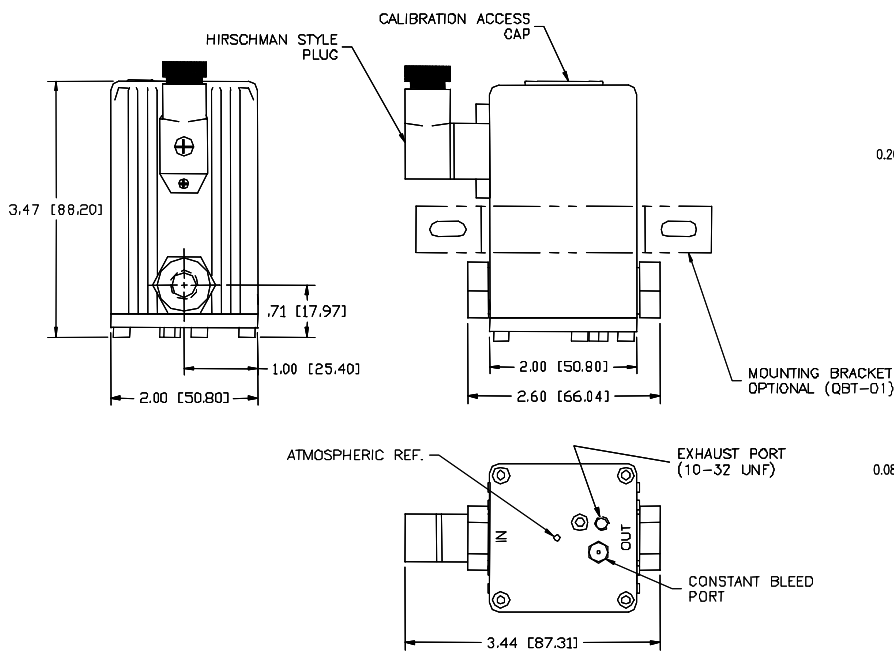


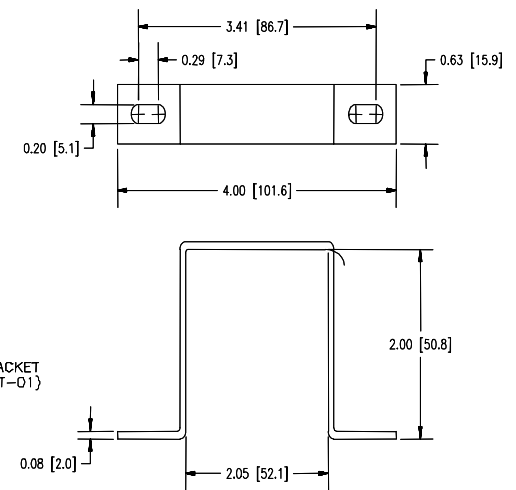
Figure 2

DIMENSIONS in [mm]

QPV1 CONTROL VALVE



MOUNTING BRACKET



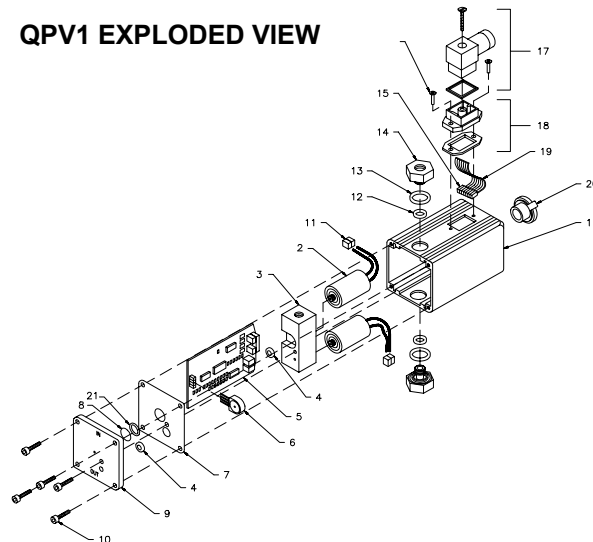
PARTS LIST

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*

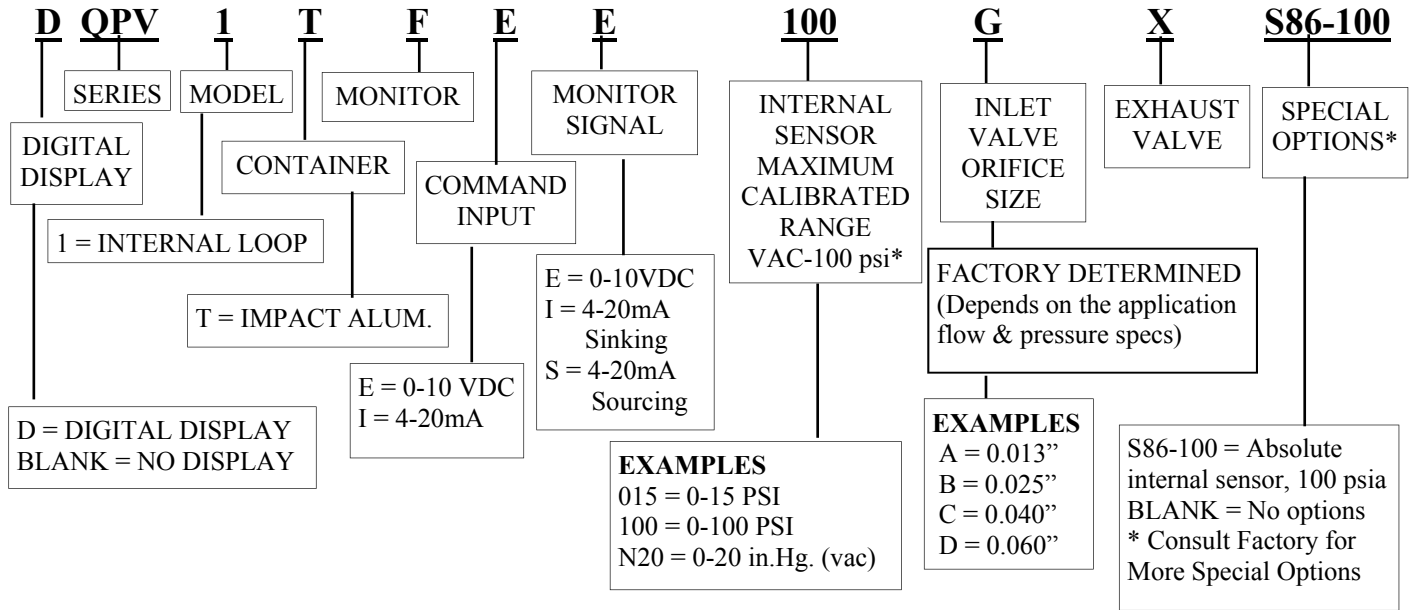
2. Consult factory
4. H134
6. Consult factory
7. H1054
10. H1049
12. H2014
13. H011
14. H1048
17. H615
20. H368
21. H040

QPV1 EXPLODED VIEW



* Include complete QPV1 part number & any modification numbers when ordering replacement parts

ORDERING INFORMATION



PID SETTING

C_x

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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