

PROPORTION



FCV Electro-Pneumatic Flow Valve

**Flow Valve with Integral
Closed Loop Position Feedback**

Accurate | Repeatable | Customizable

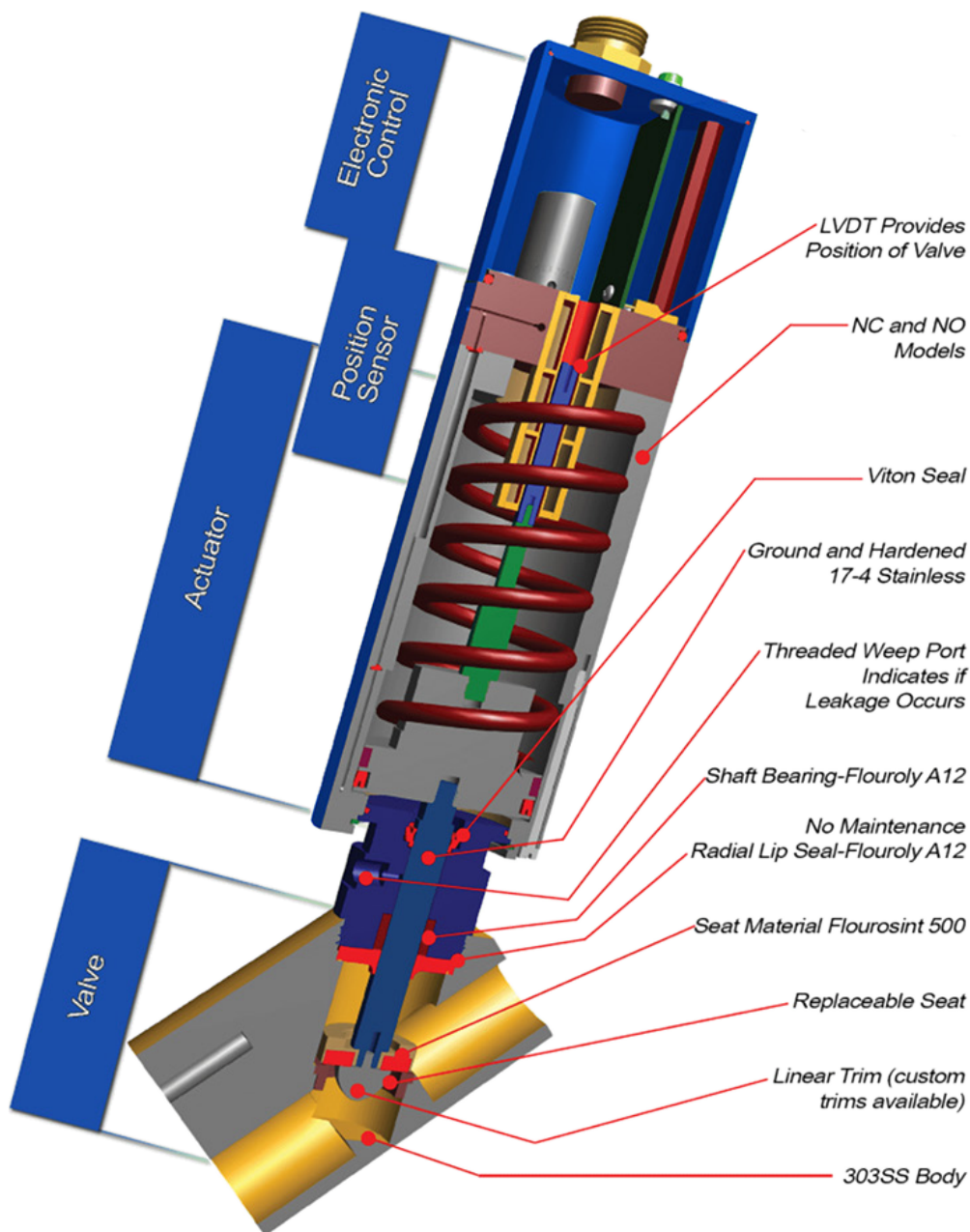
Functional Description

The Proportion-Air electro-pneumatic proportional flow valve, the FCV, employs a parabolic valve plug so that the area of valve opening is proportional to valve position.

For example, if valve position is 50% of full stroke, C_v is 50% of maximum rating. Valve position is electronically closed loop controlled, with an linear variable differential transducer (LVDT) that provides continuous feedback to the control module. The LVDT and control module are integral to the valve actuator.

The FCV comes with a monitor output signal. This output is an electrical signal originating for the internal LVDT, 0-1" stroke. The output of this signal is field selectable, 0.5-10Vdc or 4-20mA.

The FCV valve features status indicating LEDs for power and TTL. The TTL signal is a conditional on/off signal to use for diagnostic purposes. When the valve is at position, the TTL is active low (0Vdc) and the green LED is ON.



Specifications

Electrical

| | |
|------------------------|---|
| Supply voltage | 15-24 VDC |
| Command signal | Differential 4-20 mA or 0-10 VDC <i>(field selectable)</i> |
| Valve position monitor | 4-20 Ma sourcing or 0-10VDC <i>(field selectable)</i> |
| Failure modes | <i>See Operating Modes below</i> |

Mechanical

| | |
|---------------------------|--|
| Maximum working pressure | 250 PSIG (17.25 BAR) |
| Actuator loading pressure | Minimum: 80 PSIG (5.5 BAR) Maximum: 120 PSIG (8.25 BAR) |
| Valve Cv | 0 to 19 linear to command |
| Valve Kv | 0 to 16.4 linear to command |
| End connections | 1" NPT threaded |
| Resolution | ±0.3% |
| Linearity | ±5% |
| Wetted materials | 316 SS & reinforced PTFE seals |

Physical

| | |
|---------------------------|--------------------------|
| Ambient temperature | 32-158°F (0-70°C) |
| Media working temperature | Maximum: 356°F (0-180°C) |
| Weight | 10 lbs (4.5kg) |

Operating Modes

| | FCVxxxxxNVC (normally closed, venting) | FCVxxxxxNC (normally closed, non-venting) | FCVxxxxxNVO (normally open, venting) | FCVxxxxxNO (normally open, non-venting) |
|---------------|---|--|---|--|
| Power Loss | Closes | Hold | Opens | Hold |
| Air Loss | Closes | Closes | Opens | Opens |
| 0VDC or 4mA | Closed | | Fully Open | |
| 10VDC or 20mA | Fully Open | | Closed | |

Operating modes indicate the function of the valve during normal use and operation only. Operating modes indicated should not be relied upon for safety.

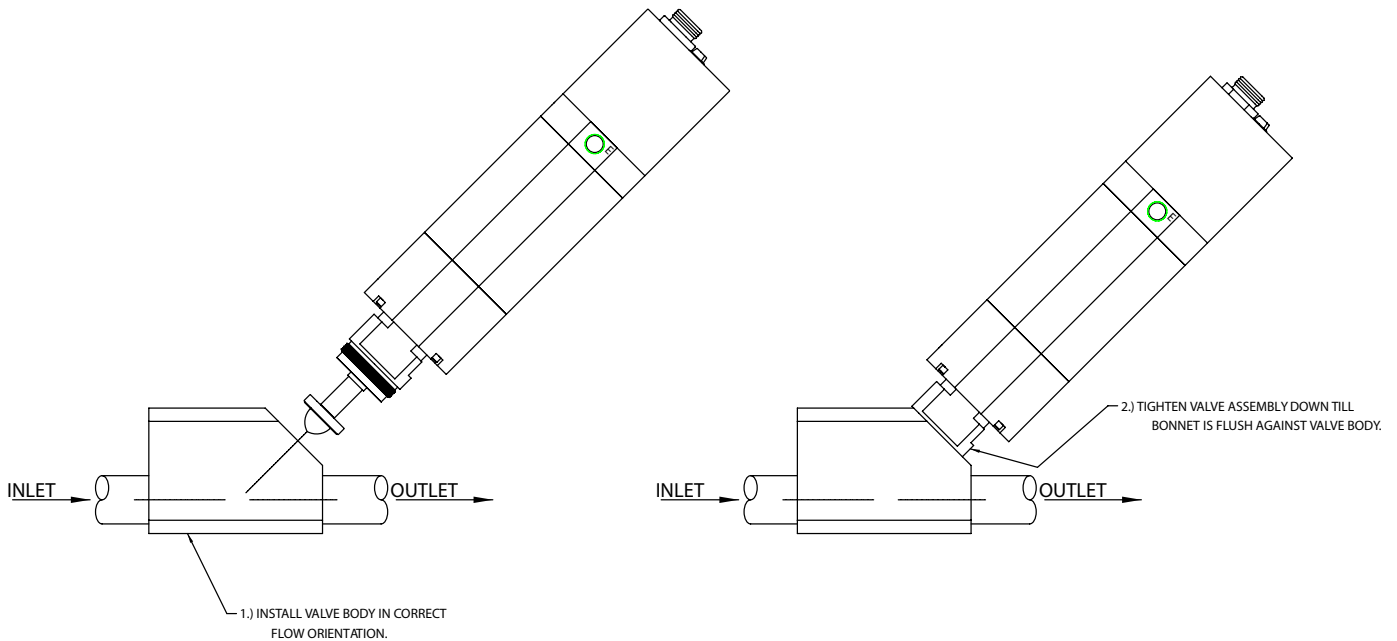
Venting: upon loss of power, loading pressure on actuator is relieved to atmosphere allowing the valve spring to return to its normal operating mode.

Non-Venting: upon loss of power, pressure is trapped causing the actuator to hold loading position until loading pressure is decayed.

Connection Procedure

Pneumatic Connections:

1. A typical 20 micron (minimum 40 micron) in-line filter is recommended on the pneumatic inlet port "I" of the FCV valve.
2. Connect pneumatic supply pressure, 80 to 120 psig, to the inline filter on the "I" port.
3. Install valve body in correct flow orientation.
4. Tighten valve assembly down till bonnet is flush against valve body.
5. Proceed with electrical connection.

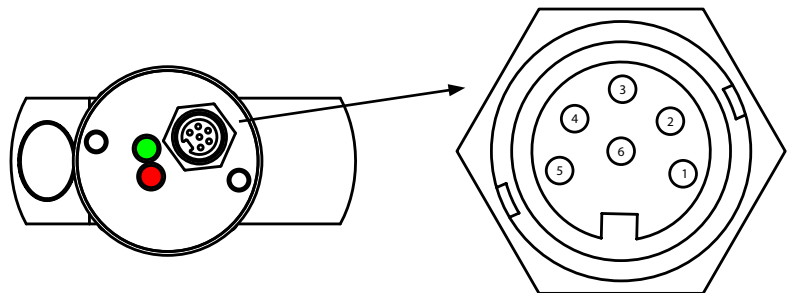


Electrical Connections:

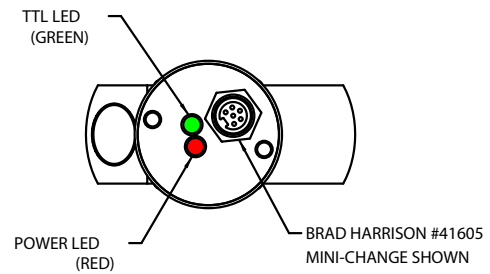
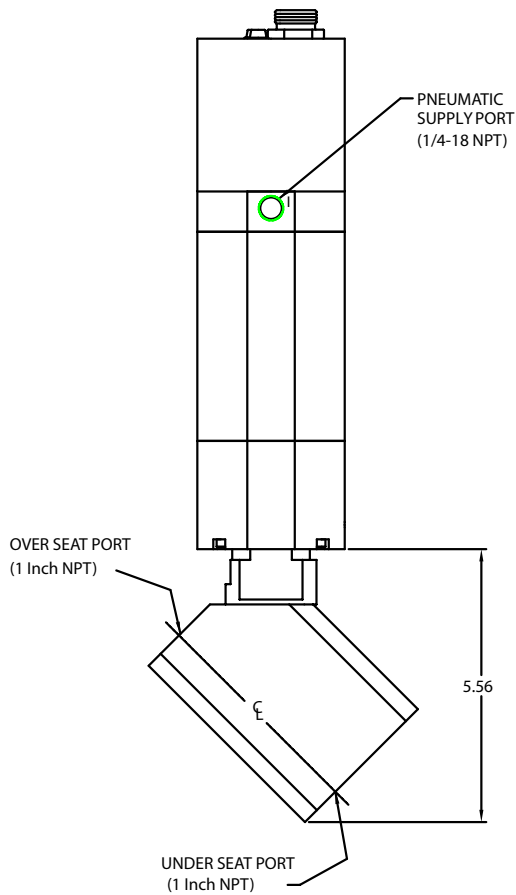
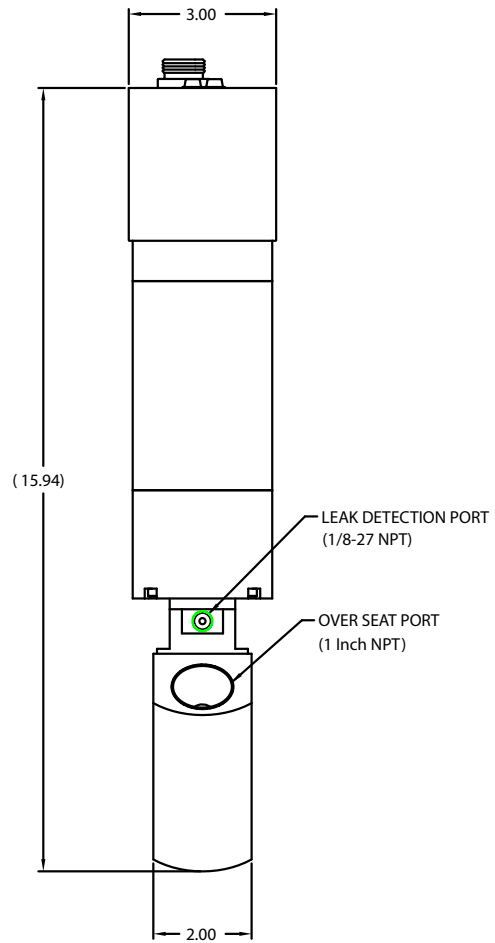
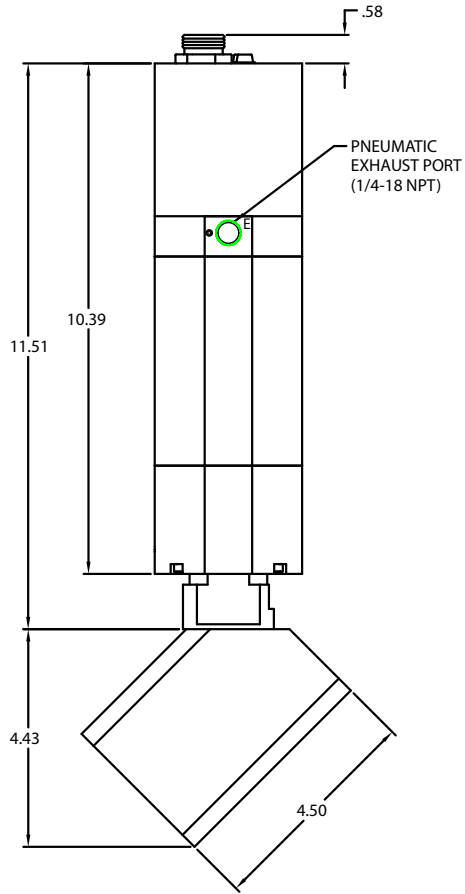
1. Ensure all power is off before making any electrical connections.
2. Figure 3 shows the location of the 6 pin electrical connector and figure 4 shows the connector. The table below identifies each connection.
3. All valves come with a red LED light and a green LED light. The red light on the unit indicates power is supplied to the unit. Green light indicates the valve's pressure status. A bright green glow indicates that desired position has been achieved.

Note: Both current and voltage command units require that both the command (+) and command (-) pins be connected.

| Pin | Color | Function |
|-----|--------|-----------------|
| 1 | White | Command (+) |
| 2 | Red | Analog Output |
| 3 | Green | DC Common |
| 4 | Orange | TTL Out |
| 5 | Black | 15-24 VDC Power |
| 6 | Blue | Command (-) |



Dimensions



NOTES:

1. All measurements are in inches
2. All dimensions are for reference only

Configuration

FCV

| | | | |
|--|--------|----------|------------------------|
| PORT SIZE | 1" NPT | PRESSURE | 0 to 250 psig (17 bar) |
| LIQUID & GAS FLOW CONTROL VALVE | | | |

| | | | | | | | |
|----------------------|-----|---|---|---|----|----|---------|
| Example Part Number | FCV | 8 | E | E | SS | NO | OC |
| Section Reference -> | | 1 | 2 | 3 | 4 | 5 | OPTIONS |

| 1 Port Size | |
|-------------|--------|
| 8 | 1" NPT |

| 2 Command Signal Range | |
|-------------------------------------|---------------|
| E | 0 to 10 VDC |
| I | 4 to 20 mA DC |
| K | 0 to 5 VDC |
| V | 1 to 5 VDC* |
| *Requires V for Monitor Signal (#3) | |

| 3 Monitor Signal Range | |
|---|--------------------------|
| X | No Monitor |
| E | 0 to 10 VDC |
| K | 0 to 5 VDC* |
| V | 1 to 5 VDC* ¹ |
| S | 4 to 20 mA DC (Sourcing) |
| *Requires E, I or K for Command Signal Range (#2) | |
| * ¹ Requires V for Command Signal Range (#2) | |

| 4 Body Material | |
|-----------------|-----------------------------------|
| SS | Stainless Steel with Full 1" Seat |
| S6 | Stainless Steel with 3/4" Seat |

| 5 Type | |
|--------|------------------------------|
| NO | Normally Open, Non-Venting |
| NVO | Normally Open, Venting |
| NC | Normally Closed, Non-Venting |
| NVC | Normally Closed, Venting |

| Options | |
|---------|------------------------------|
| OC | Offset for Positive Shut-off |

| Recommended Accessories | |
|-------------------------|------------------------------|
| BKT-01 | Wrap-Around Mounting Bracket |
| H6DC6 | 6' Power Cable |
| H6DC12 | 12' Power Cable |
| H6DC15 | 15' Power Cable |



SAFETY PRECAUTIONS

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

WARNING

Improper operation could result in serious injury 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, 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 people or damage 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

1. 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.

2. Proportion-Air, Inc. is exempted from any damage or loss whatsoever caused by malfunctions of its products when combined with other devices or software.

3. 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.

4. 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 eighteen (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.



ProportionAir.com

8250 N 600 W

P.O. Box 218

McCordsville, IN 46055

info@proportionair.com

Handcrafted in the USA
ISO 9001-2015 Certified