



Non-Surge Check Valves

# Model 120-6PS



General representation



Fueling



Aviation  
Fueling

## Rate of Flow/Pump Suction Control/Check Valve

### Description

The rate of flow/pump suction control/check valve shall function to control or limit the flow rate, regardless of fluctuations in upstream or downstream pressure. It shall also prevent the pump suction vacuum from exceeding a predetermined value. If downstream pressure becomes greater than upstream pressure, the valve will close fully to prevent reverse flow.

The OCV 120-6PS has a wide range of applications - anywhere the flow rate and pump suction vacuum must be controlled or limited and reverse flow must be prevented. It therefore has an ideal application as a pump discharge control valve.

### Features & Benefits

- Controls or limits flow to a predetermined rate
- Built-in orifice plate for sensing flow rate
- Limits the vacuum on the pump suction to a predetermined maximum
- Check feature closes valve on pressure reversal
- Extra-sensitive pilots
- Flow rate and vacuum are each adjustable with single screw
- Adjustable response speed
- Can be maintained without removal from the line
- Factory tested and can be preset to your requirements

### Typical Applications

Commercial Airports

Military Bases

Bulk Fuel Storage Tanks

Truck On/Off Loading



### Certification & Compliance

NSF-ISO Quality System (9001)



ABS Type Approval



Joint Certification Program



UFGS-33 52 43.14 Guide Specifications



CE (Conformité Européenne) Compliance



Fuel Farms

Hydrant Systems

Mobile Refueling Equipment (Carts/Trucks/Tankers)

Refineries



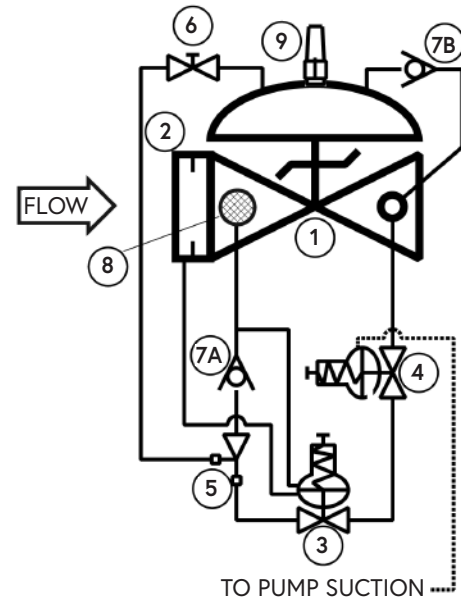
### Operation

The normally open, spring-loaded pilot, sensing the differential across the integral orifice plate, which is located in the valve inlet flange, responds to changes in differential and causes the main valve to do the same. Increased differential (flow rate) works to close the pilot and main valve, whereas decreased differential works to open them. The net result is a constant modulating action of the pilot and main valve to hold the differential, hence the flow rate, constant.

Similarly, a normally open, spring-loaded pilot senses the pressure or vacuum on the suction side of the pump. An increase in vacuum works to close the pilot and main valve until the vacuum decreases to within prescribed limits.

The pilot system is equipped with a needle valve that fine tunes the valve's response to the system variables.

If downstream pressure becomes greater than upstream pressure, the valve will fully close to prevent reverse flow.



### Components

The OCV 120-6PS consists of the following components, arranged as shown on the schematic diagram:

- 1 Model 65 Basic Control Valve
- 2 Orifice Plate
- 3 Model 2450 Rate of Flow Control Pilot
- 4 Model 1355XS Vacuum Control Pilot
- 5 Model 126 Ejector
- 6 Model 141-2 Needle Valve
- 7 Model 141-1 Check Valve
- 8 Model 123 Inline Strainer
- 9 Model 155 Visual Indicator (optional)

### Pressure Table

| End Connections                               | Ductile Iron | STEEL/SST | STEEL LCB | STEEL WCB | Aluminum |
|-----------------------------------------------|--------------|-----------|-----------|-----------|----------|
| Standard (Maximum Working Pressures at 100°F) |              |           |           |           |          |
| Screwed                                       | 640 psi      | 640 psi   | --        | --        | 285 psi  |
| Grooved                                       | 300 psi      | 300 psi   | --        | --        | 200 psi  |
| 150# Flanged                                  | 250 psi      | 285 psi   | --        | --        | 285 psi  |
| 300# Flanged                                  | 640 psi      | 740 psi   | --        | --        | --       |
| Metric (Maximum Working Pressures at 37.78°C) |              |           |           |           |          |
| Screwed                                       | 44.1 bar     | 44.1 bar  | 44.1 bar  | 44.1 bar  | 19.7 bar |
| Grooved                                       | 20.7 bar     | 20.7 bar  | 20.7 bar  | 20.7 bar  | 13.8 bar |
| 150# Flanged                                  | 17.2 bar     | 19.0 bar  | 18.4 bar  | 19.7 bar  | 19.7 bar |
| 300# Flanged                                  | 44.1 bar     | 49.6 bar  | 48.0 bar  | 51.0 bar  | --       |

Based on ANSI flange ratings.

## Flow Chart

| Standard Size<br>Max. Flow (GPM)              | 1 1/4" | 1 1/2" | 2"   | 2 1/2" | 3"   | 4"    | 6"    | 8"    | 10"   | 12"   | 14"   | 16"   | 18"   | 20"   | 24"   |
|-----------------------------------------------|--------|--------|------|--------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 7.5 FT/SEC<br>(Military)                      | 40     | 50     | 80   | 120    | 180  | 300   | 680   | 1200  | 1850  | 2650  | 3200  | 4150  | 5250  | 6550  | 9400  |
| 15 FT/SEC<br>(Max.<br>Recommended)            | 70     | 100    | 160  | 230    | 350  | 600   | 1350  | 2350  | 3700  | 5250  | 6350  | 8300  | 10500 | 13100 | 18800 |
| 20 FT/SEC<br>(Max.<br>Continuous)             | 100    | 130    | 210  | 300    | 470  | 800   | 1800  | 3150  | 4950  | 7000  | 8450  | 11100 | 14000 | 17400 | 25100 |
| Metric Size<br>Max. Flow (m <sup>3</sup> /hr) | DN32   | DN40   | DN50 | DN65   | DN80 | DN100 | DN150 | DN200 | DN250 | DN300 | DN350 | DN400 | DN450 | DN500 | DN600 |
| 2.29 M/SEC<br>(Military)                      | 9      | 11     | 18   | 27     | 41   | 68    | 154   | 272   | 420   | 602   | 726   | 942   | 1192  | 1487  | 2134  |
| 4.57 M/SEC<br>(Max.<br>Recommended)           | 16     | 23     | 36   | 52     | 79   | 136   | 306   | 533   | 840   | 1192  | 1441  | 1884  | 2384  | 2974  | 4268  |
| 6.10 M/SEC<br>(Max.<br>Continuous)            | 23     | 30     | 48   | 68     | 107  | 182   | 409   | 715   | 1124  | 1589  | 1918  | 2520  | 3178  | 3950  | 5698  |

The OCV 120-6PS is normally sized to match the meter size; however, in no case should the maximum velocity exceed 20 ft/sec (metric: 6.10 meters/sec).

Resetting, maintenance and periodic testing instructions must be followed as described in detail in the applicable OCV IOM (Installation, Operation & Maintenance) Manual.

## Typical Materials

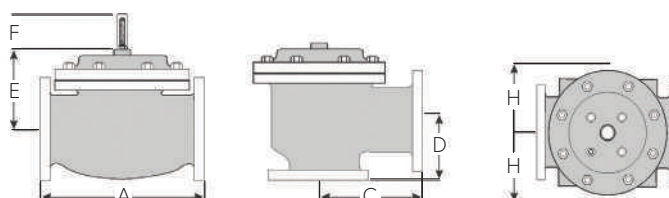
| Part                          | Standard Material                                                                   |
|-------------------------------|-------------------------------------------------------------------------------------|
| Body/Bonnet                   | Ductile Iron (epoxy coated), Carbon Steel (epoxy coated), Stainless Steel, Aluminum |
| Seat Ring                     | Stainless Steel, Bronze                                                             |
| Stem                          | Stainless Steel, Monel                                                              |
| Spring                        | Stainless Steel                                                                     |
| Diaphragm                     | Buna-N, Viton (Nylon reinforced)                                                    |
| Seat Disc                     | Buna-N, Viton                                                                       |
| Pilot                         | Stainless Steel, Bronze                                                             |
| Other Pilot System Components | Stainless Steel, Bronze/Brass                                                       |
| Tubing & Fittings             | Stainless Steel, Copper/Brass                                                       |

## General Arrangement & Dimensions

| Standard Sizes |           |                 |       |        |        |         |        |          |         |        |        |          |        |
|----------------|-----------|-----------------|-------|--------|--------|---------|--------|----------|---------|--------|--------|----------|--------|
| DIM            | END CONN. | 1 1/4" - 1 1/2" | 2"    | 2 1/2" | 3"     | 4"      | 6"     | 8"       | 10"     | 12"    | 14"    | 16"      | 24"    |
| A              | SCREWED   | 8 3/4           | 9 7/8 | 10 1/2 | 13     | ---     | ---    | ---      | ---     | ---    | ---    | ---      | ---    |
|                | GROOVED   | 8 3/4           | 9 7/8 | 10 1/2 | 13     | 15 1/4  | 20     | ---      | ---     | ---    | ---    | ---      | ---    |
|                | 150# FLGD | 8 1/2           | 9 3/8 | 10 1/2 | 12     | 15      | 17 3/4 | 25 3/8   | 29 3/4  | 34     | 39     | 40 3/8   | 62     |
|                | 300# FLGD | 8 3/4           | 9 7/8 | 11 1/8 | 12 3/4 | 15 5/8  | 18 5/8 | 26 3/8   | 31 1/8  | 35 1/2 | 40 1/2 | 42       | 63 3/4 |
| C<br>ANGLE     | SCREWED   | 4 3/8           | 4 3/4 | 6      | 6 1/2  | ---     | ---    | ---      | ---     | ---    | ---    | ---      | ---    |
|                | GROOVED   | 4 3/8*          | 4 3/4 | 6      | 6 1/2  | 7 5/8   | ---    | ---      | ---     | ---    | ---    | ---      | ---    |
|                | 150# FLGD | 4 1/4           | 4 3/4 | 6      | 6      | 7 1/2   | 10     | 12 11/16 | 14 7/8  | 17     | ---    | 20 13/16 | ---    |
|                | 300# FLGD | 4 3/8           | 5     | 6 3/8  | 6 3/8  | 7 13/16 | 10 1/2 | 13 3/16  | 15 9/16 | 17 3/4 | ---    | 21 5/8   | ---    |
| D<br>ANGLE     | SCREWED   | 3 1/8           | 3 7/8 | 4      | 4 1/2  | ---     | ---    | ---      | ---     | ---    | ---    | ---      | ---    |
|                | GROOVED   | 3 1/8*          | 3 7/8 | 4      | 4 1/2  | 5 5/8   | ---    | ---      | ---     | ---    | ---    | ---      | ---    |
|                | 150# FLGD | 3               | 3 7/8 | 4      | 4      | 5 1/2   | 6      | 8        | 11 3/8  | 11     | ---    | 15 11/16 | ---    |
|                | 300# FLGD | 3 1/8           | 4 1/8 | 4 3/8  | 4 3/8  | 5 13/16 | 6 1/2  | 8 1/2    | 12 1/16 | 11 3/4 | ---    | 16 1/2   | ---    |
| E              | ALL       | 6               | 6     | 7      | 6 1/2  | 8       | 10     | 11 7/8   | 15 3/8  | 17     | 18     | 19       | 27     |
| F (OPT)        | ALL       | 3 7/8           | 3 7/8 | 3 7/8  | 3 7/8  | 3 7/8   | 3 7/8  | 6 3/8    | 6 3/8   | 6 3/8  | 6 3/8  | 6 3/8    | 8      |
| H              | ALL       | 10              | 11    | 11     | 11     | 12      | 13     | 14       | 17      | 18     | 20     | 20       | 28 1/2 |

| Metric Sizes |           |         |      |      |      |       |       |       |       |       |       |       |       |
|--------------|-----------|---------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|
| DIM          | END CONN. | DN32-40 | DN50 | DN65 | DN80 | DN100 | DN150 | DN200 | DN250 | DN300 | DN350 | DN400 | DN600 |
| A            | SCREWED   | 222     | 251  | 267  | 330  | ---   | ---   | ---   | ---   | ---   | ---   | ---   | ---   |
|              | GROOVED   | 222     | 251  | 267  | 330  | 387   | 508   | ---   | ---   | ---   | ---   | ---   | ---   |
|              | 150# FLGD | 216     | 238  | 267  | 305  | 381   | 451   | 645   | 756   | 863   | 991   | 1026  | 1575  |
|              | 300# FLGD | 222     | 251  | 283  | 324  | 397   | 473   | 670   | 791   | 902   | 1029  | 1067  | 1619  |
| C<br>ANGLE   | SCREWED   | 111     | 121  | 152  | 165  | ---   | ---   | ---   | ---   | ---   | ---   | ---   | ---   |
|              | GROOVED   | 111*    | 121  | 152  | 165  | 194   | ---   | ---   | ---   | ---   | ---   | ---   | ---   |
|              | 150# FLGD | 108     | 121  | 152  | 152  | 191   | 254   | 322   | 378   | 432   | ---   | 529   | ---   |
|              | 300# FLGD | 111     | 127  | 162  | 162  | 198   | 267   | 335   | 395   | 451   | ---   | 549   | ---   |
| D<br>ANGLE   | SCREWED   | 79      | 98   | 102  | 114  | ---   | ---   | ---   | ---   | ---   | ---   | ---   | ---   |
|              | GROOVED   | 79*     | 98   | 102  | 114  | 143   | ---   | ---   | ---   | ---   | ---   | ---   | ---   |
|              | 150# FLGD | 76      | 98   | 102  | 102  | 140   | 152   | 203   | 289   | 279   | ---   | 398   | ---   |
|              | 300# FLGD | 79      | 105  | 111  | 111  | 148   | 165   | 216   | 306   | 298   | ---   | 419   | ---   |
| E            | ALL       | 152     | 152  | 178  | 165  | 203   | 254   | 302   | 391   | 432   | 457   | 483   | 686   |
| F (OPT)      | ALL       | 98      | 98   | 98   | 98   | 98    | 98    | 162   | 162   | 162   | 162   | 162   | 203   |
| H            | ALL       | 254     | 279  | 279  | 279  | 305   | 330   | 356   | 432   | 457   | 508   | 508   | 724   |

\*Grooved End not available in 1 1/4" (DN32).



## Technical Data

| Temperature (Elastomers)                        |                                            |
|-------------------------------------------------|--------------------------------------------|
| Buna-N                                          | -40°F to 180°F                             |
| Viton                                           | 20°F to 230°F                              |
| Fluorosilicone                                  | -40°F to 150°F                             |
| EPDM                                            | 0°F to 230°F                               |
| Sizes                                           |                                            |
| Screwed Ends                                    | 1-1/4" - 3"                                |
| Grooved Ends                                    | 1-1/2" - 6" (globe & angle)                |
| Flanged Ends                                    | 1-1/4" - 24" (globe); 1-1/4" - 16" (angle) |
| Pressure Rating (ANSI at 100°F)                 |                                            |
| 250psi for Class 150# ANSI Flanged Ductile Iron |                                            |
| 285psi for Steel/Stainless Steel & Aluminum     |                                            |
| 300# ANSI Flanges are available                 |                                            |
| Solenoid Voltage                                |                                            |
| Enclosure                                       | Explosion Proof NEMA 4X, 6P, 7, 9          |
| Body                                            | Brass, Stainless Steel                     |
| Voltages                                        | 24, 120, 240, 480 VAC; 12, 24 VDC          |

| Body & Cover Material             |
|-----------------------------------|
| Ductile Iron                      |
| Carbon Steel                      |
| Stainless Steel                   |
| Aluminum                          |
| Trim Material                     |
| Bronze/Brass                      |
| Stainless Steel                   |
| Copper                            |
| Optional Components               |
| Two-Stage Opening                 |
| Visual Indicator                  |
| Pre-Wired Junction Box            |
| Items to Specify                  |
| Fluid Type                        |
| Model Number                      |
| Size                              |
| Body & Trim Material              |
| Solenoid Voltage                  |
| Globe or Angle                    |
| Special Installation Requirements |

## Engineering Specifications

The rate of flow/pump suction control/check valve shall be a single-seated, line pressure operated, diaphragm actuated, pilot controlled valve. The valve shall seal by means of a corrosion-resistant seat and a resilient, rectangular seat disc. These, and other parts, shall be replaceable without removing the valve from the line. The stem of the main valve shall be guided top and bottom by integral bushings. Alignment of the body, bonnet and diaphragm assembly shall be by precision dowel pins. The diaphragm shall not be used as a seating surface, nor shall the pistons be used as an operating means. The pilot system shall be furnished complete and installed on the main valve. It shall include a needle valve speed control, pilot check valves, and an inline strainer. The rate of flow/pump suction control/check

valve shall be operationally and hydrostatically tested prior to shipment. The main valve body and bonnet shall be ductile iron. All ferrous surfaces shall be coated with 4 mils of epoxy. The main valve seat ring shall be stainless steel. Elastomers (diaphragms, resilient seats and o-rings) shall be Buna-N. The control pilot, opening speed control, check valves, and control line tubing shall be stainless steel. The rate of flow/pump suction control/check valve shall be suitable on <voltage> (see Technical Data section). The rate of flow/pump suction control/check valve shall be suitable for pressures of <X> psi (see Pressure Table) at flow rates up to <X> gpm (see Flow Chart). The rate of flow/pump suction control/check valve shall be an OCV 120-6PS, as manufactured by OCV, Tulsa, OK, USA.