

General representation



Fueling

Terminal  
Services

## Solenoid Control Valve

### Description

The solenoid control valve shall operate by means of discrete electrical signals. The valve shall be equipped with two 2-way solenoid valves that will allow the valve to be opened, closed, or held in any intermediate position. The solenoids shall be configured so that the valve will open/close/hold position on loss of electric power. The OCV 115-3 has a wide range of applications - anywhere it may be required to position a valve electrically, including the following:

- Process control
- Supervisory flow or pressure control
- Fuel terminal loading racks

### Features & Benefits

- Electrically operated solenoids enable the valve to be opened, closed, or held in any position
- Can be maintained without removal from the line
- Independently adjustable opening and closing speeds
- Factory tested and can be pre-set to your requirements
- Needle valves can be used for isolation during maintenance and troubleshooting

### Certification & Compliance

NSF-ISO Quality System (9001)



ABS Type Approval



Technical Standards &amp; Safety Authority



American-Made: American Recovery &amp; Reinvestment



Pressure Equipment Directive Certified 2014/68/EU



CE (Conformité Européenne) Compliance



### Typical Applications

Metering Systems



Loading Terminals



Storage Tanks



Truck/Rail Car Loading &amp; Unloading Systems

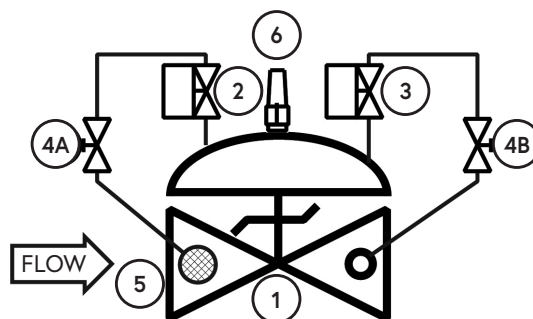


### Operation

Two 2-way solenoids operate the OCV 115-3. The first connects the main valve inlet to the diaphragm chamber and, when it is open, causes the main valve to close. The second solenoid connects the diaphragm chamber to the main valve outlet and, when it is open, allows the main valve to open. A needle valve is installed in series with each solenoid, allowing separate adjustment of the valve opening and closing speeds.

The solenoids can be supplied to give one of the following "default" modes on absence or loss of electrical power:

- Default to closed
- Default to open
- Default in last position



### Components

The OCV 115-3 consists of the following components, arranged as shown on the schematic diagram:

- 1 Model 65 Basic Valve (fail closed)
- 2 Model 450 2-Way Solenoid Pilot
- 3 Model 451 2-Way Solenoid Pilot
- 4 Model 141-2 Needle Valve
- 5 Model 123 Inline Strainer
- 6 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 115-3 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

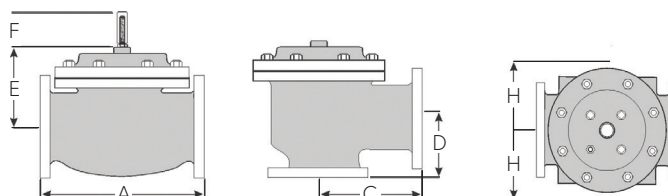
| Part                          | Standard Material   |
|-------------------------------|---|
| Body/Bonnet                   | Ductile Iron (epoxy coated), Carbon Steel (epoxy coated), Stainless Steel, Aluminum |
| Seat Ring                     | Stainless Steel, Bronze   |
| Stem                          | 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 solenoid valve shall be a single-seated, line pressure operated, diaphragm actuated, pilot controlled globe 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 two needle valves, an inline strainer and two solenoid valves. The solenoid shut-off 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 needle valve and control line tubing shall be stainless steel. The solenoid valves shall have stainless steel bodies, explosion-proof enclosures and be suitable for operation on <voltage> (see Technical Data section). The solenoid control valve shall be suitable for pressures of <X to X> psi (see Pressure Table) at flow rates up to <X> gpm (see Flow Chart). The solenoid control valve shall be an OCV 115-3, as manufactured by OCV, Tulsa, OK, USA.