Solenoid Valves

Screw-in Cartridge Valves

Maximum Pressure 210 bar (3000 psi) – Maximum Flow 227 l/min (60 USgpm)
Introduction

For over seventy years, Vickers has provided its customers with quality products and innovative solutions for all their power and motion control needs.

We are committed to maintaining this position by offering the most comprehensive range of cartridge valves for industrial and mobile equipment.

The products featured in this catalog represent the very best in screw-in cartridge solenoid valve technology. Products in this catalog have been fatigue tested for one million cycles at 132% or 10 million cycles at 115% of rated pressure.

Two pressure ratings are shown for all products featured in this catalog – typical application pressure and fatigue pressure. The typical application pressure rating is the maximum recommended operating pressure for the valve in a given system. The fatigue pressure rating is the pressure for the valve to be free for infinite life from metal fatigue.

This catalog gives basic specifications for many of Vickers screw-in cartridge solenoid valves. Its purpose is to provide a quick, convenient reference tool when choosing Vickers cartridge valves or designing a system using these components.

Vickers solenoid valves are offered with the widest choice of flow paths and position options to satisfy most requirements. These options include:

- 2-way, 2-position, normally open and normally closed spool and poppet valves
- 3-way, 2-position spool valves
- 4-way, 2-position spool valves
- 4-way, 3-position spool valves

Valve Features and Benefits

- Rated flows up to 227 l/min (60 USgpm)
- Poppet and spool designs
- Cartridge industry recognized cavities
- One piece, fully molded coils
- All operating parts are hardened steel, ground and honed for long life and low leakage
- Cartridge design for maximum flexibility and minimal manifold space requirements
- Optional low-cost manual override is available on selected models
- All exposed surfaces are zinc dichromate plated to resist corrosion
- All aluminum manifolds are gold anodized to resist corrosion
- Reliable, economical and compact

Coil Features and Benefits

The solenoid operated directional valves in this catalog are offered with a choice of standard voltages and several types of electrical connections. For other coil ratings and connections, consult your Vickers representative.

Standard AC coils are internally rectified to supply them with DC current, therefore they have no "inrush" current value.

- Coils are rated for continuous duty
- Coils are interchangeable for serviceability
- Variety of voltages and terminations
- Coils offer a one-piece weather-proof encapsulated design, eliminating the need for extra seals.
- AC voltage coils are internally full-wave rectified for 50 or 60 cycle (Hz) applications.

An arc suppression diode molded into the coil is available as a standard option on DC coils. Also available, but not shown in this catalog are explosion-proof coils and cartridges that are CSA approved and recognized by the US Underwriters Laboratories. For information and availability, contact your Vickers representative.

Protection of Internally Rectified Coils

The rectifiers used in these coils may require protection from high voltage surges in some electrical circuits containing highly inductive or capacitive components. These include certain types of motors, solenoids, relays, and transformers.

Protection is simple and inexpensive. It consists of installing a commercially available voltage surge suppressor like the General Electric MOV verister V130LA20A for 115 volts AC or the V250LA20A for 230 volts AC, across the AC line supplying the rectified components. A single suppressor will normally protect all of the rectified components in the circuit, as shown in the surge suppressor circuit diagram below.

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SV5-8-C/CM
2-way, poppet type, normally closed solenoid valve

Description
The SV5-8-C is a 2-way, 2-position, poppet type, pilot operated, normally closed, solenoid valve. This valve is used in applications requiring low leakage, such as single acting cylinder applications.

Operation
In the de-energized position, the SV5-8-C blocks flow from port 2 to port 1, and free flow is allowed from port 1 to port 2. In the energized position, flow from port 1 to port 2 is restricted and free flow is allowed from port 2 to port 1.

Ratings and specifications

Performance data is typical with fluid at 21.8 cSt (105 SUS) and 49°C (120°F)

- Typical application pressure (all ports) ............... 210 bar (3000 psi)
- Cartridge fatigue pressure (infinite life) ............... 210 bar (3000 psi)
- Rated flow ........................................... 23 l/min (6 USgpm)
- Internal leakage) ............................... less than 5 drops / min. max. @ 210 bar (3000 psi)
- Coil duty) ........................................... Continuous from 85% to 110% of nominal voltage
- Response times (100% rated voltage and flow) .......... Energize: 18 ms
- ...................................................... De-energize: 46 ms
- Temperature range) ......................... –40 to 120°C (~–40°C to 248°F)
- Cavity) ........................................... C-8-2 (See page 74)
- Fluids) ........................................... All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
- Filtration) ........................................... Cleanliness code 18/16/13
- Standard housing material) ......................... Aluminum
- Weight including coil) ................................ 0.28 kg (0.62 lbs.)
- Seal kit) ........................................... 02-165875 Buna-N, 02-165877 Viton®

Viton is a registered trademark of E.I. DuPont Co.

Pressure Drop Curves
Cartridge only

A -Port 1 to port 2 de-energized
B -Port 2 to port 1 energized
**Model Code**

SV5-8-C/CM

### Function
- **SV5** – Solenoid valve

### Size
- 8 - 8 size

### Seals
- **Blank** - Buna-N
- **V** - Viton

### Style
- **C** - Normally closed

### Manual override option
- **Blank** - No manual override
- **M** - Knob type

### Valve housing material
- **A** - Aluminum

### Port size
- **Blank** - Cartridge only

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<td>8T</td>
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<td>02-160694</td>
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</table>

*See page 77 for housings*

### Voltage rating
- **Blank** - No coil
- **12D** - 12VDC
- **24D** - 24VDC
- **36D** - 36VDC
- **24A** - 24VAC
- **120A** - 120VAC
- **240A** - 240VAC
- **12B** - 12VDC/w diode*
- **24B** - 24VDC/w diode*

*optional arc suppression diode

### Connector types
- **Blank** - No coil

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<td>02-178001</td>
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<td>02-178803</td>
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### Dimensions (mm (inch))

- **31.7 (1.25)**
- **50.8 (2.00)**
- **27.8 (1.09)**
- **47.8 (1.88)**
- **15.8 (0.62) hex**
- **22.2 (0.87) hex**
- **0.750"-16 Thd.**
- **∅ 12.62 (0.497)**

**WARNING**

Maintain 5-8 Nm (4-6 lbf ft) maximum torque on valve tube nut. Over tightening may cause valve failure.

*Torque cartridge in housing 34-41 Nm (25-30 lbf ft)*

Valve is shown with “W” coil. See other coils on page 80.

*Note
When solenoid valve is ordered as cartridge only, nut is included.*

*For valve dimensions with manual override option installed see page 83*
SV1-10-C/CM/CR
2-way, poppet type, normally closed solenoid valve

Description
The SV1-10-C is a 2-way, 2-position, pilot operated, poppet type, normally closed, screw-in cartridge solenoid valve.

Operation
In the de-energized position, this valve blocks flow from port 2 to port 1 and free flow is allowed from port 1 to port 2. In the energized position, flow from port 1 to port 2 is restricted while free flow is allowed from port 2 to port 1.

Ratings and specifications
Performance data is typical with fluid at 21.8 cSt (105 SUS) and 49°C (120°F)
Typical application pressure (all ports) ................. 210 bar (3000 psi)
Cartridge fatigue pressure (infinite life) .................... 210 bar (3000 psi)
Rated flow ............................................ 45 l/min (12 USgpm)
Internal leakage (port 2 to port 1) ............... 5 drops/min. maximum @ 210 bar (3000 psi)
Temperature range ..................................... −40 to 120°C (−40°F to 248°F)
Coil duty ............................................. Continuous from 85% to 110% of nominal voltage
Cavity .................................................. C-10-2 (See page 74)
Fluids .................................................. All general purpose hydraulic fluids such as:
                                             MIL-H-5606, SAE 10, SAE 20, etc.
Filtration ............................................ Cleanliness code 18/16/13
Standard housing material ................................. Aluminum
Weight including coil .................................. 0.4 kg (0.87 lb.)
Seal kit ............................................... 565803 Buna-N
                                             566086 Viton®
Viton is a registered trademark of E.I. DuPont Co.

Pressure Drop Curves
Cartridge only

A - Port 1 to port 2 de-energized
B - Port 2 to port 1 energized
Model Code

SV1-10-C/CM/CR

SV1 - 10 (V) - C (*) - ** - **** *

1  2  3  4  5  6  7  8

1  Function
SV1 – Solenoid valve

2 Size
10 – 10 size

3 Seals
Blank – Buna-N
V – Viton

4 Style
C – Normally closed

5 Manual override option
Blank – No manual override
M – Knob type
R – Cable type

6 Port size
0 - Cartridge only

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<th>Port size</th>
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<td>8H</td>
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7 Voltage rating
00 – No coil
12D – 12VDC
24D – 24VDC
36D – 36VDC
24A – 24VAC
120A – 120VAC
240A – 240VAC
12B – 12VDC/w diode*
24B – 24VDC/w diode*

*optional arc suppression diode

8 Connector types
Blank – No coil
G - ISO 4400 DIN 43650
DIN 43650
P - 1/2" NPT conduit port w/ leadwire
Q - Spade terminals
W - Leadwire
N - Deutsch (DC only)
Y - Deutsch (DC only)

9 Dimensions
mm (inch)

19.4 (0.77)  38.9 (1.53)  57.1 (2.25)  31.7 (1.25)  19.0 (0.75) hex  0.875”-16 Thd.  15.80 (0.622)

Torque cartridge in housing
47-54 Nm (35-40 lbf ft)

Valve is shown with “W” coil. See other coils on page 81.

Note
When solenoid valve is ordered as cartridge only, nut is included.

For valve dimensions with manual override option installed see page 83

WARNING
Maintain 5-8 Nm (4-6 lbf ft) maximum torque on valve tube nut. Overtightening may cause valve failure.
**SV2-10-C/CM/CR**

2-way, poppet type, normally closed solenoid valve

**Description**

The SV2-10-C is a 2-way, 2-position, pilot operated, poppet type, normally closed, screw-in cartridge solenoid valve.

**Operation**

In the de-energized position, this valve blocks flow from port 2 to port 1 and free flow is allowed from port 1 to port 2. In the energized position, flow from port 1 to port 2 is restricted while free flow is allowed from port 2 to port 1.

**Ratings and specifications**

*Performance data is typical with fluid at 21.8 cSt (105 SUS) and 49°C (120°F)*

- Typical application pressure (all ports) .................. 210 bar (3000 psi)
- Cartridge fatigue pressure (infinite life) .................. 210 bar (3000 psi)
- Rated flow .................................................. 23 l/min (6 USgpm)
- Internal leakage (port 2 to port 1) ..................... 5 drops/min. maximum @ 210 bar (3000 psi)
- Temperature range .................................... -40 to 120°C (-40°F to 248°F)
- Coil duty .................................................. Continuous from 85% to 110% of nominal voltage
- Cavity ...................................................... C-10-2 (See page 74)
- Fluids ...................................................... All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
- Filtration .................................................. Cleanliness code 18/16/13
- Standard housing material ................................. Aluminum
- Weight including coil ..................................... 0.4 kg (0.87 lb.)
- Seal kit ...................................................... 565803 Buna-N
  566086 Viton®

Viton is a registered trademark of E.I. DuPont Co.

**Pressure Drop Curves**

Cartridge only

A - Port 1 to port 2 de-energized
B - Port 2 to port 1 energized

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Flow in lpm (21.8 cSt oil @ 49°C)

Flow in USgpm (105 SUS oil @ 120°F)
Model Code

SV2-10-C/CM/CR

[Diagram of solenoid valve]

Function
SV2 – Solenoid valve

Size
10 – 10 size

Seals
Blank – Buna-N
V – Viton

Style
C – Normally closed

Manual override option
Blank – No manual override
M – Knob type
R – Cable type

Port size
0 – Cartridge only

Voltage rating
00 – No coil
12D – 12VDC
24D – 24VDC
36D – 36VDC
24A – 24VAC
120A – 120VAC
240A – 240VAC
12B – 12VDC/w diode*
24B – 24VDC/w diode*

Connector types
Blank – No coil
G – ISO 4400 DIN 43650
DIN 43650
P – 1/2” NPT conduit port w/ leadwire
Q – Spade terminals
W – Leadwire
N – Deutsch (DC only)
Y – Deutsch (AC only)

Dimensions
mm (inch)

19.4 (0.77)
38.9 (1.53)
46.0 (1.81)
8.6 (0.34)
19.0 (0.75) hex
25.4 (1.00) hex
0.875”-14 Thd.

Torque cartridge in housing
47-54 Nm (35-40 lbf ft)

Valve is shown with “W” coil.
See other coils on page 81.

Note
When solenoid valve is ordered as cartridge only, nut is included.

For valve dimensions with manual override option installed see page 83

WARNING
Maintain 5-8 Nm (4-6 lbf ft) maximum torque on valve tube nut. Over tightening may cause valve failure.
SV3-10-C/CM/CR
2-way, poppet type, normally closed solenoid valve

Description
The SV3-10-C is a 2-way, 2-position, poppet-type, normally closed screw-in cartridge solenoid valve.

Operation
In the de-energized position, flow is blocked from port 2 to port 1 and free flow is allowed from port 1 to port 2. In the energized position, the poppet lifts to allow flow in either direction.

Ratings and specifications

- **Performance data is typical with fluid at 21.8 cSt (105 SUS) and 49°C (120°F)**
- **Typical application pressure port 1 to port 2** ............. 210 bar (3000 psi)
- **Cartridge fatigue pressure (infinite life)** ......... 210 bar (3000 psi)
- **Rated flow** ........................................... 45 l/min (12 USgpm)
- **Internal leakage (port 2 to 1)** ........... less than 5 drops / min. max. @ 210 bar (3000 psi)
- **Temperature range** .................................. –40 to 120°C (–40°F to 248°F)
- **Coil duty** ........................................... Continuous from 85% to 110% of nominal voltage
- **Cavity** ........................................... C-10-2 (See page 74)
- **Fluids** ........................................... All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
- **Filtration** ........................................... Cleanliness code 18/16/13
- **Standard housing material** ................................ Aluminum
- **Weight including coil** ................................ 0.4 kg (0.87 lb.)
- **Seal kit** ........................................... 565803 Buna-N 566086 Viton®

Viton is a registered trademark of E.I. DuPont Co.

Pressure Drop Curves
Cartridge only

Pressure Drop Curves

A - Port 1 to port 2 de-energized
B - Port 2 to port 1 energized
**Model Code**

**SV3-10-C/CM/CR**

---

### Function

**SV3**  –  Solenoid valve

### Size

**10**  –  10 Size

### Seals

- **Blank**  -  Buna-N
- **V**  -  Viton

### Style

- **C**  -  Normally closed

### Manual override option

- **Blank**  -  No manual override
- **M**  -  Knob type
- **R**  -  Cable type

---

#### Port size

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<th>Port size</th>
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*See pages 76 & 77 for housings*

---

#### Connector types

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<tr>
<th>Voltage</th>
<th>G - ISO 4400 DIN 43650</th>
<th>P - 1/2” NPT conduit port w/ leadwire</th>
<th>Q - Spade terminals</th>
<th>W - Leadwire</th>
<th>N - Deutsch (DC only)</th>
<th>Y - Amp JR (DC only)</th>
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---

### Dimensions

- **mm (inch)**
  - **19.4 (0.77)**
  - **38.9 (1.53)**
  - **46.0 (1.81)**
  - **8.6 (0.34)**
  - **57.1 (2.25)**
  - **31.7 (1.25)**
  - **19.0 (0.75) hex**
  - **0.875”-14 Thd.**
  - **∅15.80 (0.622)**

*Optional arc suppression diode*

---

**WARNING**

Maintain 5-8 Nm (4-6 lbf ft) maximum torque on valve tube nut. Overtightening may cause valve failure.

---

*Torque cartridge in housing 47-54 Nm (35-40 lbf ft)*

*Valve is shown with “W” coil. See other coils on page 81.*

*Note When solenoid valve is ordered as cartridge only, nut is included.*

*For valve dimensions with manual override option installed see page 83*
SV3-12-C/CM/CR
2-way, poppet type, normally closed solenoid valve

Description
The SV3-12-C is a 2-way, 2-position, poppet-type, pilot-operated, normally closed solenoid cartridge valve.

Operation
In the de-energized position, flow is blocked from port 2 to port 1 and free flow is allowed from port 1 to port 2. In the energized position, the poppet lifts to allow flow in either direction.

Ratings and specifications
Performance data is typical with fluid at 21.8 cSt (105 SUS) and 49°C (120°F)

- Typical application pressure (port 1 to 2) ................. 210 bar (3000 psi)
- Cartridge fatigue pressure (infinite life) ................. 210 bar (3000 psi)
- Rated flow ........................................ 114 l/min (30 USgpm)
- Internal leakage port “2” to port “1” . less than 5 drops / min. max. @ 210 bar (3000 psi)
- Temperature range .................................. −40 to 120°C (−40° to 248°F)
- Coil duty ............................................. Continuous fro 85% to 110% nominal voltage
- Response time (100% rated flow and voltage) .......... Energize: 75 ms
  De-energize: 150 ms
- Cavity .............................................. C-12-2 or C-12-2U (See page 74)
- Fluids ............................................ All general purpose hydraulic fluids such as:
  MIL-H-5606, SAE 10, SAE 20, etc.
- Filtration .......................................... Cleanliness code 18/16/13
- Standard housing material ................................ Aluminum
- Weight including coil .................................. 0.336 kg (0.74 lb.)
- Seal kit ............................................. 02-165889 Buna-N
  02-165888 Viton®

Viton is a registered trademark of E.I. DuPont Co.

Pressure Drop Curves
Cartridge only

![Pressure Drop Curves](image)

A - Port 1 to port 2 de-energized
B - Port 1 to port 2 energized
Model Code

SV3-12-C/CM/CR

<table>
<thead>
<tr>
<th>Function</th>
<th>SV3 – Solenoid valve</th>
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</thead>
<tbody>
<tr>
<td>Size</td>
<td>12 – 12 Size</td>
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<tr>
<td>Seals</td>
<td>Blank – Buna-N, V – Viton</td>
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<tr>
<td>Style</td>
<td>C - Normally closed</td>
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<tr>
<td>Manual override option</td>
<td>Blank - No manual override, M - Knob type, R - Cable type</td>
</tr>
<tr>
<td>Valve housing material</td>
<td>Omit for cartridge only, A - Aluminum</td>
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</table>

| Port size | Code | Housing number |
|----------------------|----------------------|
| 0 - Cartridge only | 4G 1/2" BSPP | 02-161118 (C-12-2) |
| | 6G 3/4" BSPP | 02-161117 (C-12-2) |
| | 10T SAE 10 | 02-160640 (C-12-2) |
| | 12T SAE 12 | 02-160644 (C-12-2) |
| | 4G 1/2" BSPP | 02-161116(C-12-2)U |
| | 6G 3/4" BSPP | 02-161115(C-12-2)U |
| | 10T SAE 10 | 02-160641(C-12-2)U |
| | 12T SAE 12 | 02-160645(C-12-2)U |

| Cavity | Blank - Cavity w/o undercut, U - Cavity w/undercut |

| Voltage rating | Code | Housing number |
|----------------------|----------------------|
| 00 - No coil | 4G 1/2" BSPP | 02-161118 (C-12-2) |
| | 6G 3/4" BSPP | 02-161117 (C-12-2) |
| | 10T SAE 10 | 02-160640 (C-12-2) |
| | 12T SAE 12 | 02-160644 (C-12-2) |

Dimensions

mm (inch)

Torque cartridge in housing 81-95 Nm (60-70 lbf ft)
Valve is shown with "W" coil.
See other coils on page 81.

Note
When solenoid valve is ordered as cartridge only, nut is included.

For valve dimensions with manual override option installed see page 83

![WARNING]

Maintain 5-8 Nm (4-6 lbf ft) maximum torque on valve tube nut. Overtightening may cause valve failure.
Description

The SV1-16-C is a 2-way, 2-position, poppet type, pilot operated, normally closed screw-in cartridge solenoid valve.

Operation

In the de-energized position, flow is blocked from port 2 to port 1 and free flow is allowed from port 1 to port 2. In the energized position, bi-directional flow is allowed between port 1 and port 2.

Ratings and specifications

Performance data is typical with fluid at 21.8 cSt (105 SUS) and 49°C (120°F)

Typical application pressure (all ports) ......................... 210 bar (3000 psi)
Cartridge fatigue pressure (infinite life) ......................... 210 bar (3000 psi)
Rated flow ................................................... 132 l/min (35 USgpm)
Internal leakage port “2” to port “1” .............................. less than 5 drops / min. max. @ 210 bar (3000 psi)
Temperature range .............................................. –40 to 120°C (–40°F to 248°F)
Coil duty ......................................................... Continuous from 85% to 110% nominal voltage
Cavity .............................................................. C-16-2 (See page 74)
Fluids .............................................................. All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration .......................................................... Cleanliness code 18/16/13
Standard housing material ........................................... Aluminum
Weight including coil ............................................... 1.15 kg (2.53 lb.)
Seal kit ............................................................ 565810 Buna-N
889609 Viton®

Viton is a registered trademark of E.I. DuPont Co.

Pressure Drop Curves

Cartridge only

Flow in lpm (21.8 cSt oil @ 49°C)

Flow in USgpm (105 SUS oil @ 120°F)

A - Port 2 to port 1 energized
B - Port 1 to port 2 de-energized
Model Code SV1-16-C/CM/CR

Function
SV1 – Solenoid valve

Size
16 - 16 Size

Seals
Blank - Buna-N
V - Viton

Style
C - Normally closed

Manual override option
Blank - No manual override
M - Knob type
R - Cable type

Port size
0 - Cartridge only

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<tr>
<th>Code</th>
<th>Port size</th>
<th>Housing number</th>
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Voltage rating

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<th>12D - 12VDC</th>
<th>24D - 24VDC</th>
<th>36D - 36VDC</th>
<th>24A - 24VAC</th>
<th>120A - 120VAC</th>
<th>240A - 240VAC</th>
<th>12B - 12VDC/w diode*</th>
<th>24B - 24VDC/w diode*</th>
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Connector types

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<th>Voltage</th>
<th>G - ISO 4400 DIN 43650</th>
<th>P - 1/2&quot; NPT conduit port w/ leadwire</th>
<th>Q - Spade terminals</th>
<th>W - Leadwire</th>
<th>N - Deutsch (DC only)</th>
<th>Y - Amp JR (DC only)</th>
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Dimensions

mm (inch)

Material: Steel

Torque cartridge in housing 108-122 Nm (80-90 lbf ft)
Valve is shown with “W” coil.
See other coils on page 81.

Note
When solenoid valve is ordered as cartridge only, nut is included.

For valve dimensions with manual override option installed see page 83

WARNING
Maintain 5-8 Nm (4-6 lbf ft) maximum torque on valve tube nut. Overtightening may cause valve failure.
SV2-20-C/CM/CR
2-way, poppet type, normally closed solenoid valve

Description
The SV2-20-C is a 2-way, 2-position, poppet type, pilot operated, normally closed screw-in cartridge solenoid valve.

Operation
In the de-energized position, flow is blocked from port 2 to port 1 and free flow is allowed from port 1 to port 2. In the energized position, bi-directional flow is allowed between port 1 and port 2.

Ratings and specifications
Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49° C (120° F)
Typical application pressure (all ports) ......................... 210 bar (3000 psi)
Cartridge fatigue pressure (infinite life) ........................ 210 bar (3000 psi)
Rated flow ......................................................... 227 l/min (60 USgpm)
Internal leakage port 2 to port 1 ............................... less than 5 drops / min. max. @ 210 bar (3000 psi)
Temperature range ................................................. −40 to 120° C (−40° to 248° F)
Coil duty .......................................................... Continuous from 85% to 110% nominal voltage
Cavity ............................................................... C-20-2 (See page 74)
Fluids .............................................................. All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration .......................................................... Cleanliness code 18/16/13
Standard housing material ................................. Aluminum
Weight including coil ............................................... 1,2 kg (2.70 lb.)
Seal kit .............................................................. 889615 Buna-N
889619 Viton®
Viton is a registered trademark of E.I. DuPont Co.

Pressure Drop Curves
Cartridge only

A-Port 1 to port 2 de-energized
B-Port 2 to port 1 energized
SV 2 - 20 (V) - C (*) - **** - **** - *

Function
- SV2: Solenoid valve

Size
- 20: 20 Size

Seals
- Blank: Buna-N
- V: Viton

Style
- C: Normally closed

Manual override option
- Blank: No manual override
- M: Knob type
- R: Cable type

Port size
- 0: Cartridge only

Voltage rating
- 00: No coil
- 12D: 12VDC
- 24D: 24VDC
- 36D: 36VDC
- 24A: 24VAC
- 120A: 120VAC
- 240A: 240VAC
- 12B: 12VDC/w diode*
- 24B: 24VDC/w diode*

Connector types
- Blank: No coil
- G: ISO 4400 DIN 43650
- D: 1/2" NPT conduit port w/ leadwire
- P: Spade terminals
- W: Leadwire
- N: Deutsch (DC only)
- Y: Amp JR (DC only)

Dimensions
- mm (inch)

Torque cartridge in housing
128-155 Nm (95–115 lbf ft)

When solenoid valve is ordered as a cartridge only, nut is included.

Valve is shown with "W" coil.
See page 81 for other coils.

For valve dimensions with manual override option installed see page 83

WARNING
Maintain 5-8 Nm (4-6 lbf ft) maximum torque on valve tube nut. Over tightening may cause valve failure.
SV4-8-C/CM
2-way, spool type, normally closed solenoid valve

Description
The SV4-8-C is a two-way, two-position, spool type, direct acting, normally closed solenoid valve.

Operation
In the de-energized position, the SV4-8-C blocks flow in both directions. In the energized position, the spool lifts to allow flow in either direction.

Ratings and specifications
*Performance data is typical with fluid at 21.8 cSt (105 SUS) and 49°C (120°F)*

- Typical application pressure (all ports) .......................... 210 bar (3000 psi)
- Cartridge fatigue pressure (infinite life) .......................... 210 bar (3000 psi)
- Rated flow ................................................................. 11 l/min (3 USgpm)
- Internal leakage ................................. 82 cm³/min (5 in³/min) max. @ 210 bar (3000 psi)
- Coil duty ................................................................. Continuous from 85% to 110% of nominal voltage
- Response times (100% rated voltage and flow) .................. Energize: 27 ms
  De-energize: 24 ms
- Temperature range ..................................................... −40 to 120°C (−40° to 248°F)
- Cavity ................................................................. C-8-2 (See page 74)
- Fluids ................................................................. All general purpose hydraulic fluids such as:
  MIL-H-5606, SAE 10, SAE 20, etc.
- Filtration ................................................................. Cleanliness code 18/16/13
- Standard housing material .............................................. Aluminum
- Weight including coil .................................................. 0.27 kg (0.60 lbs.)
- Seal kit ................................................................. 02-160777 Buna-N
  02-160778 Viton®
  Viton is a registered trademark of E.I. DuPont Co.

Pressure Drop Curve
**Cartridge only**

---

Port 1 to port 2 energized
Port 2 to port 1 energized
Model Code

SV4-8-C/CM

**Function**
- SV4 – Solenoid valve

**Size**
- 8 – 8 Size

**Seals**
- Blank - Buna-N
- V - Viton

**Style**
- C - Normally closed

**Manual override option**
- Blank - No manual override
- M - Knob type

**Valve housing material**
- A - Aluminum

**Dimensions**

<table>
<thead>
<tr>
<th>Voltage</th>
<th>Code</th>
<th>Port size</th>
<th>Housing number</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>2G</td>
<td>1/4&quot; BSPP</td>
<td>02-160727</td>
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<td>12D</td>
<td>3G</td>
<td>3/8&quot; BSPP</td>
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<td>4T</td>
<td>SAE 4</td>
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<td>24A</td>
<td>8T</td>
<td>SAE 8</td>
<td>02-160732</td>
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</tbody>
</table>

See page 77 for housings

**Port size**
- 0 - Cartridge only

**Connector types**
- Blank - No coil
- G - ISO 4400 DIN 43650 1/2" NPT conduit port
- P - Spade terminals
- Q - Leadwire
- W - Leadwire
- N - Deutsch (DC only)
- Y - Amp JR (DC only)

**Voltage rating**
- 00 - No coil
- 12D - 12VDC
- 24D - 24VDC
- 36D - 36VDC
- 24A - 24VAC
- 120A - 120VAC
- 240A - 240VAC
- 12B - 12VDC/w diode*
- 24B - 24VDC/w diode*  
*optional arc suppression diode

**Series coil**
- S - 8-series coil, 16 W

Torque cartridge in housing 34-41 Nm (25-30 lbf ft)
Valve is shown with "W" coil.
See other coils on page 81.

Note
When solenoid valve is ordered as cartridge only, nut is included.

For valve dimensions with manual override option installed see page 83

**WARNING**

Maintain 5-8 Nm (4-6 lbf ft) maximum torque on valve tube nut. Overtightening may cause valve failure.
SV4-10-C/CM/CR
2-way, spool type, normally closed solenoid valve

**Description**

The SV4-10-C is a 2-way, 2-position, direct acting, spool-type, normally closed screw-in cartridge solenoid valve.

**Operation**

In the de-energized position, flow is blocked in both directions. In the energized position, the spool lifts to allow flow in either direction.

**Ratings and specifications**

*Performance data is typical with fluid at 21.8 cSt (105 SUS) and 49°C (120°F)*

- Typical application pressure (all ports) .................. 210 bar (3000 psi)
- Cartridge fatigue pressure (infinite life) .................. 210 bar (3000 psi)
- Rated flow ................................................. 23 l/min (6 USgpm)
- Internal leakage ........................................... 82 cm³ / min. (5 in³ / min) max. @ 210 bar (3000 psi)
- Temperature range ....................................... –40°C to 120°C (–40°F to 248°F)
- Coil duty ................................................. Continuous from 85% to 110% of nominal voltage
- Cavity ......................................................... C-10-2 (See page 74)
- Fluids ..................................................... All general purpose hydraulic fluids such as:
  - MIL-H-5606, SAE 10, SAE 20, etc.
- Filtration .................................................. Cleanliness code 18/16/13
- Standard housing material .................................. Aluminum
- Weight including coil ................................. 0.4 kg (0.87 lb.)
- Seal kit .................................................. 565806 Buna-N
  889627 Viton®

Viton is a registered trademark of E.I. DuPont Co.

---

**Pressure Drop Curve**

Cartridge only

---

Port 1 to port 2 energized
Port 2 to port 1 de-energized
Model Code

SV4-10-C/CM/CR

SV4 - 10 (V) - C (*) - ** - **** *

Function
SV4 – Solenoid valve

Size
10 - 10 size

Seals
Blank - Buna-N
V - Viton

Style
C - Normally closed

Manual override option
Blank - No manual override
M - Knob type
R - Cable type

Port size
0 - Cartridge only

Code | Port size | Housing number |
--- | --- | --- |
3B | 3/8" BSPP | 02-175462 |
6T | SAE 6 | 566151 |
2G | 1/4" BSPP | 876702 |
3G | 3/8" BSPP | 876703 |
6H | SAE 6 | 876700 |
8H | SAE 8 | 876701 |

Voltage rating
00 - No coil
12D - 12VDC
24D - 24VDC
36D - 36VDC
24A - 24VAC
120A - 120VAC
240A - 240VAC
12B - 12VDC/w diode*
24B - 24VDC/w diode*

Connector types
Blank - No coil
G - ISO 4400 DIN 43650
DIN 43650
P - 1/2" NPT conduit port w/ leadwire
Q - Spade terminals
W - Leadwire
N - Deutsch (DC only)
Y - Amp JR (DC only)

Dimensions
mm (inch)

Torque cartridge in housing
47-54 Nm (35-40 lbf ft)

Valve is shown with "W" coil.
See other coils on page 81.

Note
When solenoid valve is ordered as cartridge only, nut is included.

For valve dimensions with manual override option installed see page 83

WARNING
Maintain 5-8 Nm (4-6 lbf ft) maximum torque on valve tube nut. Overtightening may cause valve failure.
SV5-8-O/OP/OS
2-way, poppet type, normally open solenoid valve

Description
The SV5-8-O is a 2-way, 2-position, poppet type, pilot operated, normally open, solenoid valve. This valve is used in applications requiring low leakage, such as single acting cylinder applications.

Operation
In the de-energized position, the SV5-8-O allows free flow from port 2 to port 1, and restricted flow from port 1 to port 2. In the energized position, flow is blocked from Port 2 to Port 1, and free flow is allowed from Port 1 to Port 2.

Ratings and specifications
Performance data is typical with fluid at 21.8 cSt (105 SUS) and 49°C (120°F)

- Typical application pressure (all ports): 210 bar (3000 psi)
- Cartridge fatigue pressure (infinite life): 210 bar (3000 psi)
- Rated flow: 23 l/min (6 USgpm)
- Internal leakage: less than 5 drops / min. max. @ 210 bar (3000 psi) with valve energized
- Coil duty: Continuous from 85% to 110% of nominal voltage
- Response times (100% rated voltage and flow): Energize: 24 ms, De-energize: 25 ms
- Temperature range: -40° to 120°C (~-40° to 248°F)
- Cavity: C-8-2 (See page 74)
- Fluids: All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
- Filtration: Cleanliness code 18/16/13
- Standard housing material: Aluminum
- Weight including coil: 0.28 kg (0.62 lbs.)
- Seal kit: 02-165875 Buna-N, 02-165877 Viton®

Viton is a registered trademark of E.I. DuPont Co.

Pressure Drop Curves
Cartridge only

A - Port 1 to port 2 energized
B - Port 2 to port 1 de-energized
Model Code

SV5-8-O/OP/OS

Function
SV5 – Solenoid valve

Size
8 – 8 Size

Seals
Blank- Buna-N
V - Viton

Style
O - Normally open

Manual override option
Blank - No manual override
P - Push type
S - Screw type

Housing material
omit for cartridge only
A - Aluminum

Port size
0 - Cartridge only

Voltage rating
00 - No coil
12D - 12VDC
24D - 24VDC
36D - 36VDC
24A - 24VAC
120A - 120VAC
240A - 240VAC
12B - 12VDC/w diode*
24B - 24VDC/w diode*

*optional arc suppression diode

Connector types
Blank - No coil

Torque cartridge in housing
34-41 Nm (25-30 lbf ft)

Valve is shown with "W" coil.
See other coils on page 80.

Note
When solenoid valve is ordered as
cartridge only, nut is included.

For valve dimensions with manual
override option installed see page 83

WARNING

Maintain 5-8 Nm (4-6 lbf ft) maximum
torque on valve tube nut. Overtightening
may cause valve failure.
The SV3-10-O is a 2-way, 2-position, poppet type, pilot operated, normally open, screw-in cartridge solenoid valve.

In the de-energized position, this valve allows bi-directional flow between port 1 and port 2. In the energized position, flow is blocked from port 2 to port 1, and is allowed from port 1 to port 2 when coil forces are overcome.

Performance data is typical with fluid at 21.8 cSt (105 SUS) and 49°C (120°F)

Typical application pressure (all ports) .................. 210 bar (3000 psi)
Cartridge fatigue pressure (infinite life) .................. 210 bar (3000 psi)
Rated flow ................................................. 45 l/min (12 USgpm)
Internal leakage port 2 to port 1 . . . less than 5 drops / min. max. @ 210 bar (3000 psi)
Temperature range .............................................. −40°C to 120°C (−40°F to 248°F)
Coil duty .................................................. Continuous from 85% to 110% nominal voltage
Cavity .................................................. C-10-2 (See page 74)
Fluids .................................................. All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration .................................................. Cleanliness code 18/16/13
Standard housing material .................................. Aluminum
Weight including coil ........................................... 0.4 kg (0.87 lb.)
Seal kit .................................................. 565803 Buna-N 566086 Viton®

Viton is a registered trademark of E.I. DuPont Co.
**Model Code**

**SV3-10-O/OP/OS**

### Function
- **SV3** - Solenoid valve

### Size
- **10** - 10 size

### Seals
- **Blank** - Buna-N
- **V** - Viton

### Style
- **O** - Normally open

### Manual override option
- **Blank** - No manual override
- **P** - Push type
- **S** - Screw type

### Port size
- **0** - Cartridge only

### Voltage rating
- **00** - No coil
- **12D** - 12VDC
- **24D** - 24VDC
- **36D** - 36VDC
- **24A** - 24VAC
- **120A** - 120VAC
- **240A** - 240VAC
- **12B** - 12VDC/w diode*
- **24B** - 24VDC/w diode*

*optional arc suppression diode

### Connector types
- **Blank** - No coil

### Dimensions
- mm (inch)

- **∅ 15.80 (0.622)**
- **31.7 (1.25)**
- **38.9 (1.53)**
- **19.0 (0.75) hex**
- **25.4 (1.00) hex**
- **26.4 (1.04) hex**
- **46.0 (1.81)**
- **8.6 (0.34)**
- **19.4 (0.77)**

**WARNING**

Maintain 5-8 Nm (4-6 lbf ft) maximum torque on valve tube nut. Overtightening may cause valve failure.

Valve is shown with "W" coil. See other coils on page 81.

When solenoid valve is ordered as cartridge only, nut is included.

For valve dimensions with manual override option installed see page 83
SV5-10-O/OP/OS
2-way, poppet type, normally open solenoid valve

Description
The SV5-10-O is a 2-way, 2-position, poppet type, pilot operated, normally open, screw-in cartridge solenoid valve.

Operation
In the de-energized position, flow from port 1 to port 2 is restricted while free flow is allowed from port 2 to port 1. In the energized position, flow is blocked from port 2 to port 1, and flow is allowed from port 1 to port 2 when coil forces are overcome.

Ratings and specifications
*Performance data is typical with fluid at 21.8 cSt (105 SUS) and 49°C (120°F)*

- Typical application pressure (all ports) .................. 210 bar (3000 psi)
- Cartridge fatigue pressure (infinite life) .................. 210 bar (3000 psi)
- Rated flow .................................................. 45 l/min (12 USgpm)
- Internal leakage port 2 to port 1 ........ less than 5 drops / min. max. @ 210 bar (3000 psi)
- Temperature range ........................................... –40 to 120°C (–40°F to 248°F)
- Coil duty ..................................................... Continuous from 85% to 110% nominal voltage
- Cavity ....................................................... C-10-2 (See page 74)
- Fluids ......................................................... All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
- Filtration ..................................................... Cleanliness code 18/16/13
- Standard housing material ................................. Aluminum
- Weight including coil ...................................... 0.4 kg (0.87 lb.)
- Seal kit ...................................................... 565803 Buna-N 566086 Viton®

Viton is a registered trademark of E.I. DuPont Co.

Pressure Drop Curve
Cartridge only

Port 1 to port 2
and port 2 to port 1 de-energized
Model Code

SV5-10-O/OP/OS

Function

SV5 - Solenoid valve

Size

10 - 10 size

Seals

Blank - Buna-N
V - Viton

Style

O - Normally open

Manual override option

Blank - No manual override
P - Push type
S - Screw type

Port size

<table>
<thead>
<tr>
<th>Code</th>
<th>0 - Cartridge only</th>
</tr>
</thead>
<tbody>
<tr>
<td>3B</td>
<td>3/8&quot; BSPP</td>
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<tr>
<td>6T</td>
<td>SAE 6</td>
</tr>
<tr>
<td>2G</td>
<td>1/4&quot; BSPP</td>
</tr>
<tr>
<td>3G</td>
<td>3/8&quot; BSPP</td>
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<tr>
<td>6H</td>
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</tr>
<tr>
<td>8H</td>
<td>SAE 8</td>
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Port size

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<tr>
<th>Housing number</th>
<th>3/8&quot; BSPP</th>
<th>SAE 6</th>
<th>1/4&quot; BSPP</th>
<th>3/8&quot; BSPP</th>
<th>SAE 6</th>
<th>SAE 8</th>
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</table>

See pages 76 & 77 for housings

Voltage rating

<table>
<thead>
<tr>
<th>Voltage</th>
<th>00 - No coil</th>
<th>12D - 12VDC</th>
<th>24D - 24VDC</th>
<th>36D - 36VDC</th>
<th>24A - 24VAC</th>
<th>120A - 120VAC</th>
<th>240A - 240VAC</th>
<th>12B - 12VDC/w diode*</th>
<th>24B - 24VDC/w diode*</th>
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</thead>
<tbody>
<tr>
<td>12D</td>
<td>02-178086</td>
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<td>02-178073</td>
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</table>

Connector types

<table>
<thead>
<tr>
<th>Blank - No coil</th>
<th>G - ISO 4400 DIN 43650</th>
<th>P - 1/2&quot; NPT conduit port w/ leadwire</th>
<th>Q - Spade terminals</th>
<th>W - Leadwire</th>
<th>N - Deutsch (DC only)</th>
<th>Y - Amp JR (DC only)</th>
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</table>

Dimensions

mm (inch)

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>19.4 (0.77)</th>
<th>19.0 (0.75)</th>
<th>25.4 (1.00)</th>
<th>8.6 (0.34)</th>
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</thead>
<tbody>
<tr>
<td>mm</td>
<td>38.9 (1.53)</td>
<td>70.0 (2.76)</td>
<td>31.7 (1.25)</td>
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<tr>
<td>inch</td>
<td>1.81 (0.07)</td>
<td>0.875&quot;-14 Thd.</td>
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<td></td>
</tr>
</tbody>
</table>

Torque cartridge in housing
47-54 Nm (35-40 lbf ft)

Valve is shown with “W” coil.
See other coils on page 81.

Note

When solenoid valve is ordered as cartridge only, nut is included.

For valve dimensions with manual override option installed see page 83

WARNING

Maintain 5-8 Nm (4-6 lbf ft) maximum torque on valve tube nut. Overtightening may cause valve failure.

02-178762
02-178846
SV3-12-O/OP/OS
2-way, poppet type, normally open solenoid valve

**Description**
The SV3-12-O is a 2-way, 2-position, poppet-type, pilot-operated, normally open solenoid cartridge valve.

**Operation**
In the de-energized position, flow can pass through the valve from port 1 to port 2, or from port 2 to port 1. In the energized position, flow is blocked from port 2 to port 1, and allowed from port 1 to port 2 when the coil force is overcome.

**Ratings and specifications**
*Performance data is typical with fluid at 21.8 cSt (105 SUS) and 49°C (120°F)*

- Typical application pressure (port 1 to port 2) ............... 210 bar (3000 psi)
- Cartridge fatigue pressure (infinite life) ......................... 210 bar (3000 psi)
- Rated flow .................................................. 114 l/min (30 USgpm)
- Internal leakage port (port 2 to port 1), less than 5 drops / min. max. @ 210 bar (3000 psi)
- Temperature range .............................................. −40 to 120°C (−40°F to 248°F)
- Coil duty .................................................. Continuous from 85% to 110% nominal voltage
- Response time (100% rated flow and voltage) .................... Energize: 75 ms De-energize: 150 ms

- Cavity .................................................. C-12-2 or C-12-2U (See page 74)
- Fluids .................................................. All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
- Filtration .................................................. Cleanliness code 17/15/12
- Standard housing material ........................................ Aluminum
- Weight including coil ........................................ 0.336 kg (0.74 lb.)
- Seal kit .................................................. 02-165889 Buna-N 02-165888 Viton®

Viton is a registered trademark of E.I. DuPont Co.

**Pressure Drop Curves**
Cartridge only

**Flow in lpm (21.8 cSt oil @ 49°C)**

<table>
<thead>
<tr>
<th>Flow in lpm</th>
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<th>15</th>
<th>30</th>
<th>45</th>
<th>60</th>
<th>75</th>
<th>90</th>
<th>114</th>
</tr>
</thead>
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<tr>
<td>Pressure Drop psi</td>
<td>0</td>
<td>50</td>
<td>100</td>
<td>150</td>
<td>200</td>
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</tbody>
</table>

A - Port 2 to port 1 de-energized
B - Port 1 to port 2 energized

**Flow in USgpm (105 SUS oil @ 120°F)**

<table>
<thead>
<tr>
<th>Flow in USgpm</th>
<th>0</th>
<th>5</th>
<th>10</th>
<th>15</th>
<th>20</th>
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<th>30</th>
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Model Code

SV3-12-O/OP/OS

<table>
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<tr>
<td>SV3 - Solenoid valve</td>
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<tr>
<td>V - Viton</td>
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<table>
<thead>
<tr>
<th>Style</th>
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<tr>
<td>O - Normally open</td>
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<table>
<thead>
<tr>
<th>Manual override option</th>
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<tr>
<td>Blank - No manual override</td>
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<tr>
<td>P - Push type</td>
</tr>
<tr>
<td>S - Screw type</td>
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<table>
<thead>
<tr>
<th>Valve housing material</th>
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<table>
<thead>
<tr>
<th>Port size</th>
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<tr>
<td>0 - Cartridge only</td>
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<table>
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<tr>
<th>Cavity</th>
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<tr>
<td>U - Cavity w/undercut</td>
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<table>
<thead>
<tr>
<th>Voltage rating</th>
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<tbody>
<tr>
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<tr>
<td>12D - 12VDC</td>
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<tr>
<td>24D - 24VDC</td>
</tr>
<tr>
<td>36D - 36VDC</td>
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<tr>
<td>24A - 24VAC</td>
</tr>
<tr>
<td>120A - 120VAC</td>
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<tr>
<td>240A - 240VAC</td>
</tr>
<tr>
<td>12B - 12VDC/w diode*</td>
</tr>
<tr>
<td>24B - 24VDC/w diode*</td>
</tr>
</tbody>
</table>

*optional arc suppression diode

<table>
<thead>
<tr>
<th>Connector types</th>
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<th>Voltage</th>
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<tbody>
<tr>
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<td>P - 1/2” NPT conduit port w/ leadwire</td>
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<td>Q - Spade terminals</td>
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<td>W - Leadwire</td>
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<tr>
<td>N - Deutsch (DC only)</td>
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<tr>
<td>Y - Amp JR (DC only)</td>
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**Dimensions**

<table>
<thead>
<tr>
<th>mm (inch)</th>
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</thead>
<tbody>
<tr>
<td>19.4 (0.77)</td>
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<tr>
<td>46.0 (1.81)</td>
</tr>
<tr>
<td>19.0 (0.75) hex</td>
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<td>31.7 (1.25) hex</td>
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<tr>
<td>23.75 (0.935)</td>
</tr>
</tbody>
</table>

Torque cartridge in housing 81-95 Nm (60-70 lbf ft)

Valve is shown with “W” coil. See other coils on page 81.

**Note**

When solenoid valve is ordered as cartridge only, nut is included.

For valve dimensions with manual override option installed see page 83

**WARNING**

Maintain 5-8 Nm (4-6 lbf ft) maximum torque on valve tube nut. Overtightening may cause valve failure.
**SV3-16-O/OP/OS**

2-way, poppet type, normally open solenoid valve

### Description

The SV3-16-O is a 2-way, 2-position, poppet type, pilot operated, normally open, screw-in cartridge solenoid valve.

### Operation

In the de-energized position, this valve allows bi-directional flow between port 1 and port 2. In the energized position, flow is blocked from port 2 to port 1 and allowed from port 1 to port 2 when coil forces are overcome.

### Ratings and specifications

*Performance data is typical with fluid at 21.8 cSt (105 SUS) and 49°C (120°F)*

- Typical application pressure (all ports) .................. 210 bar (3000 psi)
- Cartridge fatigue pressure (infinite life) .................. 210 bar (3000 psi)
- Rated flow .............................................. 132 l/min (35 USgpm)
- Internal leakage port 2 to port 1 ... less than 5 drops / min. max. @ 210 bar (3000 psi)
- Temperature range ................................. −40 to 120°C (−40°F to 248°F)
- Coil duty ............................................. Continuous from 85% to 110% nominal voltage
- Cavity ................................................. C-16-2 (See page 74)
- Fluids ............................................... All general purpose hydraulic fluids such as:
  MIL-H-5606, SAE 10, SAE 20, etc.
- Filtration ............................................. Cleanliness code 18/16/13
- Standard housing material .......................... Aluminum
- Weight including coil .................................. 0.9 kg (1.98 lb.)
- Seal kit ............................................... 565810 Buna-N 889609 Viton®

Viton is a registered trademark of E.I. DuPont Co.

### Pressure Drop Curves

*Cartridge only*

- **A** - Port 1 to port 2 energized
- **B** - Port 2 to port 1 de-energized

---

**Flow in lpm (21.8 cSt oil @ 49°C)**

**Pressure Drop psi**

**Flow in USgpm (105 SUS oil @ 120°F)**

**Pressure Drop bar**
SV3-16-O/OP/OS

**Function**
- SV3 – Solenoid valve

**Size**
- 16 – 16 Size

**Seals**
- Blank – Buna-N
- V – Viton

**Style**
- Blank – Normally open
- P – Push type
- S – Screw type

**Port size**
- 0 – Cartridge only

<table>
<thead>
<tr>
<th>Code</th>
<th>Port size</th>
<th>Housing number</th>
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</thead>
<tbody>
<tr>
<td>6B</td>
<td>3/4&quot; BSPP</td>
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<td>12T</td>
<td>SAE 12</td>
<td>566149</td>
</tr>
<tr>
<td>6G</td>
<td>3/4&quot; BSPP</td>
<td>876718</td>
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<tr>
<td>10H</td>
<td>SAE 10</td>
<td>876717</td>
</tr>
<tr>
<td>12H</td>
<td>SAE 12</td>
<td>566113</td>
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</tbody>
</table>

See pages 76 and 77 for housings

**Manual override option**
- Blank – No manual override
- P – Push type
- S – Screw type

**Connector types**
- Blank – No coil

<table>
<thead>
<tr>
<th>Voltage</th>
<th>G - ISO 4400 DIN 43650</th>
<th>P - 1/2&quot; NPT conduit port w/ leadwire</th>
<th>Q - Spade terminals</th>
<th>W - Leadwire</th>
<th>N - Deutsch (DC only)</th>
<th>Y - Amp JR (DC only)</th>
</tr>
</thead>
<tbody>
<tr>
<td>12D</td>
<td>02-178068</td>
<td>02-178078</td>
<td>02-178070</td>
<td>02-178063</td>
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**Dimensions**

<table>
<thead>
<tr>
<th>mm (inch)</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>19.4 (0.77)</td>
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<tr>
<td>38.9 (1.53)</td>
<td></td>
</tr>
<tr>
<td>46.0 (1.81)</td>
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</tr>
<tr>
<td>8.6 (0.34)</td>
<td></td>
</tr>
<tr>
<td>38.1 (1.50) hex</td>
<td>1.312&quot;-14 Thd</td>
</tr>
<tr>
<td>44.5 (1.75)</td>
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</tr>
<tr>
<td>∅ 28.55 (1.124)</td>
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</table>

108-122 Nm (80-90 lbf ft)

Valve is shown with “W” coil.
See other coils on page 81.

Note
When solenoid valve is ordered as cartridge only, nut is included.

For valve dimensions with manual override option installed see page 83

**WARNING**

Maintain 5-8 Nm (4-6 lbf ft) maximum torque on valve tube nut. Over tightening may cause valve failure.
Description

The SV3-20-O is a 2-way, 2-position, poppet type, pilot operated, normally open, screw-in cartridge solenoid valve.

Operation

In the de-energized position, this valve allows bi-directional flow between port 1 and port 2. In the energized position, flow is blocked from port 2 to port 1 and allowed from port 1 to port 2 when coil forces are overcome.

Ratings and specifications

Performance data is typical with fluid at 21.8 cSt (105 SUS) and 49°C (120°F)

- Typical application pressure (all ports) 210 bar (3000 psi)
- Cartridge fatigue pressure (infinite life) 210 bar (3000 psi)
- Rated flow 227 l/min (60 USgpm)
- Internal leakage port 2 to port 1 less than 5 drops/min. max. @ 210 bar (3000 psi)
- Temperature range -40°C to 120°C (−40°F to 248°F)
- Coil duty Continuous from 85% to 110% nominal voltage
- Cavity C-20-2 (See page 74)
- Fluids All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
- Filtration Cleanliness code 18/16/13
- Standard housing material Aluminum
- Weight including coil 1,2 kg (2.70 lb.)
- Seal kit 889615 Buna-N 889619 Viton®

Viton is a registered trademark of E.I. DuPont Co.

Pressure Drop Curves

Cartridge only

Flow in lpm (21.8 cSt oil @ 49°C)

Flow in USgpm (105 SUS oil @ 120°F)
Model Code

SV3-20-O/OP/OS

SV3 - 20 (V) - O (*) - *** - **** *

1  2  3  4  5  6  7  8

[1] Function
SV3 – Solenoid valve

[2] Size
20 - 20 Size

[3] Seals
Blank - Buna-N
V - Viton

[4] Style
O - Normally open

Blank - No manual override
P - Push type
S - Screw type

[6] Port size
0 - Cartridge only

<table>
<thead>
<tr>
<th>Code</th>
<th>Port size</th>
<th>Housing number</th>
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</thead>
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<td>1” BSPP</td>
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<td>16T</td>
<td>SAE 16</td>
<td>566409</td>
</tr>
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<td>6G</td>
<td>3/4” BSPP</td>
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<td>8G</td>
<td>1” BSPP</td>
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<td>16H</td>
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</table>

See pages 76 & 77 for housings

[7] Voltage rating

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<td>24VDC</td>
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<td>36D</td>
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<td>24A</td>
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<td>120A</td>
<td>120VAC</td>
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<tr>
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<td>12VDC/w diode*</td>
</tr>
<tr>
<td>24B</td>
<td>24VDC/w diode*</td>
</tr>
</tbody>
</table>

*optional arc suppression diode

[8] Connector types
Blank - No coil
G - ISO 4400 DIN 43650
P - 1/2” NPT conduit port w/ leadwire
Q - Spade terminals
W - Leadwire
N - Deutsch (DC only)
Y - Amp JR (DC only)

<table>
<thead>
<tr>
<th>Voltage</th>
<th>G - ISO 4400 DIN 43650</th>
<th>P - 1/2” NPT conduit port w/ leadwire</th>
<th>Q - Spade terminals</th>
<th>W - Leadwire</th>
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<tr>
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<td>02-178833</td>
<td>02-178843</td>
<td>02-178846</td>
</tr>
</tbody>
</table>

Dimensions

mm (inch)

- 19.4 (0.77)
- 38.9 (1.53)
- 46.0 (1.81)
- 8.6 (0.34)

19.0 (0.75) hex

47.6 (1.87) hex

1.625"-12 Thd.

WARNING

Maintain 5-8 Nm (4-6 lbf ft) maximum torque on valve tube nut. Overtightening may cause valve failure.
SV4-8-O/OM
2-way, poppet type, normally open solenoid valve

Description
The SV4-8-O is a 2-way, spool type, direct acting, normally open, solenoid valve.

Operation
In the de-energized position, the SV4-8-O valve allows bi-directional flow between ports 1 and 2. In the energized position, both ports 1 and 2 are blocked.

Ratings and specifications
Performance data is typical with fluid at 21.8 cSt (105 SUS) and 49°C (120°F)

- Typical application pressure (all ports) ..................... 210 bar (3000 psi)
- Cartridge fatigue pressure (infinite life) ..................... 210 bar (3000 psi)
- Rated flow ...................................................... 13 l/min (4 USgpm)
- Internal leakage .............................................. 82 cm³/min (5 in³/min.) max. @ 210 bar (3000 psi)
- Coil duty .................................................. Continuous from 85% to 110% of nominal range
- Response times (100% rated voltage and flow) .............. Energize: 21 ms
  De-energize: 38 ms
- Temperature range .......................................... -40 to 120°C (-40° to 248°F)
- Cavity ......................................................... C-8-2 (See page 74)
- Fluids ......................................................... All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
- Filtration ...................................................... Cleanliness code 18/16/13
- Standard housing material .................................. Aluminum
- Weight including coil ....................................... 0.27 kg (0.60 lbs.)
- Seal kit ....................................................... 02-160777 Buna-N
  02-160778 Viton®

Viton is a registered trademark of E.I. DuPont Co.

Pressure Drop Curve
Cartridge only

Port 2 to port 1 de-energized and port 1 to port 2 de-energized
Model Code

SV4-8-O/OM

### Function
SV4 – Solenoid valve

### Size
8 – 8 Size

### Seals
Blank – Buna-N
V – Viton

### Style
O – Normally open

### Manual override option
Blank – No manual override
M – Knob type

### Valve housing material
Omit for cartridge only
A – Aluminum

### Port size
0 – Cartridge only

<table>
<thead>
<tr>
<th>Code</th>
<th>Port size</th>
<th>Housing number</th>
</tr>
</thead>
<tbody>
<tr>
<td>2G</td>
<td>1/4&quot; BSPP</td>
<td>02-160677</td>
</tr>
<tr>
<td>3G</td>
<td>3/8&quot; BSPP</td>
<td>02-160678</td>
</tr>
<tr>
<td>4T</td>
<td>SAE 4</td>
<td>02-160679</td>
</tr>
<tr>
<td>6T</td>
<td>SAE 6</td>
<td>02-160680</td>
</tr>
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</table>

See page 77 for housings

### Voltate rating

<table>
<thead>
<tr>
<th>Voltage</th>
<th>Code</th>
<th>Housing number</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>No coil</td>
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</tr>
<tr>
<td>12D</td>
<td>12VDC</td>
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<tr>
<td>24D</td>
<td>24VDC</td>
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</tr>
<tr>
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<td>36VDC</td>
<td>02-160679</td>
</tr>
<tr>
<td>24A</td>
<td>24VAC</td>
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<td>120VAC</td>
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<td>240A</td>
<td>240VAC</td>
<td>02-160682</td>
</tr>
<tr>
<td>12B</td>
<td>12VDC/w diode*</td>
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</tr>
<tr>
<td>24B</td>
<td>24VDC/w diode*</td>
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</table>

*optional arc suppression diode

### Connector types
Blank - No coil

<table>
<thead>
<tr>
<th>Voltage</th>
<th>G - ISO 4400 DIN 43650</th>
<th>P - 1/2&quot; NPT conduit port w/ leadwire</th>
<th>Q - Spade terminals</th>
<th>W - Leadwire</th>
<th>N - Deutsch (DC only)</th>
<th>Y - Amp JR (DC only)</th>
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</thead>
<tbody>
<tr>
<td>12D</td>
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<td>02-178803</td>
<td>02-178812</td>
<td>02-178815</td>
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</tr>
</tbody>
</table>

### Dimensions

**S** - 8-series coil, 16 W

**Torque cartridge in housing**
34-41 Nm (25-30 lbf ft)

Valve is shown with "W" coil. See other coils on page 80.

**Note**
When solenoid valve is ordered as cartridge only, nut is included.

For valve dimensions with manual override option installed see page 83

**WARNING**
Maintain 5-8 Nm (4-6 lbf ft) maximum torque on valve tube nut. Over tightening may cause valve failure.
The SV4-10-O is a 2-way, 2-position, spool type, direct acting, normally open, screw-in cartridge solenoid valve.

**Operation**

In the de-energized position, this valve allows bi-directional flow between port 1 and port 2. In the energized position both ports are closed.

**Ratings and specifications**

*Performance data is typical with fluid at 21.8 cSt (105 SUS) and 49°C (120°F)*

Typical application pressure (all ports) .......................... 210 bar (3000 psi)
Cartridge fatigue pressure (infinite life) .......................... 210 bar (3000 psi)
Rated flow ................................................................. 23 l/min (6 USgpm)
Internal leakage port 2 to port 1 .... 82 cm³/min (5 in³/min.) max. @ 210 bar (3000 psi)
Temperature range ...................................................... −40 to 120°C (−40°F to 248°F)
Coil duty ................................................................. Continuous from 85% to 110% nominal voltage
Cavity ................................................................. C-10-2 (See page 74)
Fluids ................................................................. All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration ................................................................. Cleanliness code 18/16/13
Standard housing material ........................................... Aluminum
Weight including cartridge ........................................ 0.4 kg (0.87 lb.)
Seal kit ................................................................. 565806 Buna-N 889627 Viton®

Viton is a registered trademark of E.I. DuPont Co.

---

**Pressure Drop Curve**

Cartridge only

---

Flow in lpm (21.8 cSt oil @ 49°C) vs Pressure Drop psi

Flow in USgpm (105 SUS oil @ 120°F) vs Pressure Drop bar

Port 2 to port 1 and port 1 to port 2 de-energized
Model Code

SV4-10-O/OM/OR

SV4 - 10 (V) - O (*) - ** - **** *

[1] Function
SV4 – Solenoid valve

[2] Size
10 - 10 Size

[3] Seals
Blank - Buna-N
V - Viton

[4] Style
O - Normally open

Blank - No manual override
M - Knob type
R - Cable type

[6] Port size

<table>
<thead>
<tr>
<th>Code</th>
<th>Port size</th>
<th>Housing number</th>
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</thead>
<tbody>
<tr>
<td>3B</td>
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<td>6T</td>
<td>SAE 6</td>
<td>566151</td>
</tr>
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<td>2G</td>
<td>1/4&quot; BSPP</td>
<td>876702</td>
</tr>
<tr>
<td>3G</td>
<td>3/8&quot; BSPP</td>
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<td>8H</td>
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See pages 76 & 77 for housings

[7] Voltage rating

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<th>Voltage</th>
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<td>12VDC/w diode*</td>
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<tr>
<td>24B</td>
<td>24VDC/w diode*</td>
<td>02-178113</td>
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</table>

*optional arc suppression diode

[8] Connector types
Blank - No coil

Voltage | G - ISO 4400 DIN 43650 | P - 1/2" NPT conduit port with leadwire | Q - Spade terminals | W - Leadwire | N - Deutsch (DC only) | Y - Amp JR (DC only)
<table>
<thead>
<tr>
<th></th>
<th></th>
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<td>02-178102</td>
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<td>02-178833</td>
<td>02-178843</td>
<td>02-178846</td>
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</tbody>
</table>

To main 5-8 Nm (4-6 lbf ft) maximum torque on valve tube nut. Overtightening may cause valve failure.

Dimensions
mm (inch)

Torque cartridge in housing
47-54 Nm (35-40 lbf ft)

Valve is shown with “W” coil.
See other coils on page 81.

Note
When solenoid valve is ordered as cartridge only, nut is included.

For valve dimensions with manual override option installed see page 83

![Diagram](image)

WARNING

Maintain 5-8 Nm (4-6 lbf ft) maximum torque on valve tube nut. Overtightening may cause valve failure.
SV1-8-3/3M
3-way, 2-position, spool type solenoid valve

Description
The SV1-8-3 is a 3-way, 2-position, direct acting, spool type solenoid valve. This valve can be used in applications requiring separate and tank lines, such as a single acting cylinder, or any other application where a three-way, two-position solenoid valve is needed.

Operation
In the de-energized position, the SV1-8-3 allows flow from port 2 to port 1, while port 3 is blocked. In the energized position, flow is allowed from port 1 to port 3, while port 2 is blocked.

Ratings and specifications
Performance data is typical with fluid at 21.8 cSt (105 SUS) and 49°C (120°F)
Typical application pressure (all ports) .......................... 210 bar (3000 psi)
Cartridge fatigue pressure ........................................ 210 bar (3000 psi)
Rated flow .................................................. 11 l/min (3 USgpm)
Internal leakage (per land) ................................. 82 cm³/min. (5 in³/min.) maximum @ 210 bar (3000 psi)
Temperature range ........................................... −40 to 120°C (−40° to 248°F)
Coil duty ........................................... Continuous for 85% to 110% of nominal voltage
Cavity ............................................. C-8-3 (See page 75)
Fluids ............................................. All general purpose hydraulic fluids such as:
                                      MIL-H-5606, SAE 10, SAE 20, etc.
                                      Filtration ........................................... Cleanliness code 18/16/13
                                      Standard housing material ......................... Aluminum
                                      Weight including coil .................................. 0.30 kg (0.66 lbs.)
                                      Seal kit ........................................... 02-160755 Buna-N
                                      .......................................................... 02-160756 Viton®
                                      Viton is a registered trademark of E.I. DuPont Co.

Pressure Drop Curve
Cartridge only

Operating Limits

Flow in USgpm (21.8 cSt oil @ 120°F)
Function
SV1 – Solenoid valve

Size
8 – 8 Size

Seals
Blank - Buna-N
V - Viton

Style
3 – 3-way

Manual override option
Blank - No manual override
M - Knob type

Valve housing material
Omit for cartridge only
A - Aluminum

Port size
0 - Cartridge only

<table>
<thead>
<tr>
<th>Code</th>
<th>Port size</th>
<th>Housing number</th>
</tr>
</thead>
<tbody>
<tr>
<td>2G</td>
<td>1/4&quot; BSPP</td>
<td>02-160739</td>
</tr>
<tr>
<td>3G</td>
<td>3/8&quot; BSPP</td>
<td>02-160740</td>
</tr>
<tr>
<td>4T</td>
<td>SAE 4</td>
<td>02-160741</td>
</tr>
<tr>
<td>6T</td>
<td>SAE 6</td>
<td>02-160742</td>
</tr>
</tbody>
</table>

See page 79 for housings

Connector types
Blank - No coil

# - ISO 4400
D - DIN 43650
N - 1/2" NPT
P - conduit port w/ leadwire
Q - Spade terminals
W - Leadwire
Y - Amp JR

Voltage rating
00 - No coil
12D - 12VDC
24D - 24VDC
36D - 36VDC
24A - 24VAC
120A - 120VAC
240A - 240VAC
12B - 12VDC w/ diode*
24B - 24VDC w/ diode*

*optional arc suppression diode

Dimensions
mm (inch)

<table>
<thead>
<tr>
<th>Dimension</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.20 (0.559)</td>
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<tr>
<td>15.80 (0.622)</td>
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<tr>
<td>31.9 (1.25)</td>
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<tr>
<td>40.7 (1.60)</td>
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<tr>
<td>50.8 (2.00)</td>
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<tr>
<td>47.8 (1.88)</td>
</tr>
<tr>
<td>15.8 (0.62) hex</td>
</tr>
<tr>
<td>22.2 (0.87) hex</td>
</tr>
</tbody>
</table>

Torque cartridge in housing
34-41 Nm (25-30 lbf ft)
Valve is shown with “W” coil.
See other coils on page 80.

Note
When solenoid valve is ordered as cartridge only, nut is included.

For valve dimensions with manual override option installed see page 83

WARNING
Maintain 5-8 Nm (4-6 lbf ft) maximum torque on valve tube nut. Overtightening may cause valve failure.
**SV4-8-3/3M**

3-way, 2-position, spool type solenoid valve

---

**Description**

The SV4-8-3 is a 3-way, 2-position, direct acting, spool type solenoid valve.

**Operation**

In the de-energized position, the SV4-8-3 allows flow from port 2 to port 1, while port 3 is blocked. In the energized position, flow is allowed from port 2 to port 3, while blocking port 1. Pressure on Port 1 should not exceed 20 bar (300 psi).

**Ratings and specifications**

*Performance data is typical with fluid at 21.8 cSt (105 SUS) and 49°C (120°F)*

- Typical application pressure (all ports) ...................... 210 bar (3000 psi)
- Cartridge fatigue pressure (infinite life) ...................... 210 bar (3000 psi)
- Rated flow ........................................... 13 l/min (4 USgpm)
- Internal leakage .................. 82 cm³/min. (5 in³/min.) maximum @ 210 bar (3000 psi)
- Temperature range ...................... −40 to 120°C (−40°F to 248°F)
- Coil duty ............................................. Continuous from 85% to 110% of nominal voltage
- Response times (100% rated voltage and 100% rated flow) ...... Energize: 22 ms
  De-energize: 27 ms
- Cavity .................................................. C-8-3 (See page 75)
- Fluids .................................................. All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
- Filtration ............................................. Cleanliness code 18/16/13
- Standard housing material ......................... Aluminum
- Weight including coil ................................. 0.29 kg (0.64 lb.)
- Seal kit ................................................. 02-160755 Buna-N
  02-160756 Viton®

Viton is a registered trademark of E.I. DuPont Co.

---

**Pressure Drop Curve**

Cartridge only

---

**Operating Limits**

---

A - Port 2 to port 1 and port 2 to port 3
Model Code SV4-8-3

SV4 - 8 (V) - 3 (M) - (A) **- **** * S

1. Function
SV4 – Solenoid valve

2. Size
8 – 8 Size

3. Seals
Blank – Buna-N
V – Viton

4. Style
3 – 3-way

5. Manual override option
Blank – No manual override
M – Knob type

6. Valve housing material
Omit for cartridge only
A – Aluminum

Port size
0 – Cartridge only

Code | Port size | Housing number
--- | --- | ---
2G | 1/4” BSPP | 02-160739
3G | 3/8” BSPP | 02-160740
4T | SAE 4 | 02-160741
6T | SAE 6 | 02-160742

See page 79 for housings

7. Voltage rating
00 – No coil
12D – 12VDC
24D – 24VDC
36D – 36VDC
24A – 24VAC
120A – 120VAC
240A – 240VAC
12B – 12VDC/w diode*
24B – 24VDC/w diode*

*optional arc suppression diode

Connector types
Blank – No coil

<table>
<thead>
<tr>
<th>Voltage</th>
<th>G - ISO 4400</th>
<th>P - 1/2” NPT conduit port</th>
<th>Q - Spade terminals</th>
<th>W - Leadwire</th>
<th>N - Deutsch (DC only)</th>
<th>Y - Amp JR (DC only)</th>
</tr>
</thead>
<tbody>
<tr>
<td>12D</td>
<td>02-160690</td>
<td>02-160684</td>
<td>02-160681</td>
<td>02-160678</td>
<td>02-160958</td>
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<td>24D</td>
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<td>02-160959</td>
<td>02-178002</td>
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<td>02-160686</td>
<td>02-160683</td>
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<td>02-178805</td>
<td>02-178803</td>
<td>02-178812</td>
<td>02-178815</td>
</tr>
</tbody>
</table>

8. Series coil
S – 8-series coil

Dimensions
mm (inch)

47,8 (1.88)
31,7 (1.25)
15,8 (0.62) hex
50,8 (2.00)
22,2 (0.87) hex
40,7 (1.60)
0.750”-16 Thd
15,80 (0.622)
∅ 14,20 (0.559)

Torque cartridge in housing
34-41 Nm (25-30 lbf ft)
Valve is shown with “W” coil.
See other coils on page 80.

Note
When solenoid valve is ordered as cartridge only, nut is included.

For valve dimensions with manual override option installed see page 83

WARNING
Maintain 5-8 Nm (4-6 lbf ft) maximum torque on valve tube nut. Overtightening may cause valve failure.
SV1-10-3/3M/3R
3-way, 2-position, spool type solenoid valve

**Function symbol**

![Functional symbol]

**Sectional view**

![Sectional view]

**Description**
The SV1-10-3 is a 3-way, 2-position, direct acting, spool type screw-in cartridge solenoid valve.

**Operation**
In the de-energized position, this valve allows flow from port 2 to port 1 while port 3 is blocked. In the energized position, flow is allowed from port 1 to port 3 while port 2 is blocked.

**Ratings and specifications**
*Performance data is typical with fluid at 21.8 cSt (105 SUS) and 49°C (120°F)*

- Typical application pressure (all ports) .................. 210 bar (3000 psi)
- Cartridge fatigue pressure (infinite life) .................. 210 bar (3000 psi)
- Rated flow .................................................. 23 l/min (6 USgpm)
- Internal leakage .......................... 164 cm³/min. (10 in³/min) maximum @ 210 bar (3000 psi)
- Temperature range .............................. −40 to 120°C (−40° to 248°F)
- Coil duty ............................................ Continuous from 85% to 110% nominal voltage
- Cavity .................................................. C-10-3 (See page 75)
- Fluids .................................................. All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
- Filtration ................................................ Cleanliness code 18/16/13
- Standard housing material ................................. Aluminum
- Weight including coil .................................. 0.42 kg (0.93 lb.)
- Seal kit .................................................. 565804 Buna-N 889599 Viton®

Viton is a registered trademark of E.I. DuPont Co.

**Pressure Drop Curves**
Cartridge only

![Pressure Drop Curves]

A - Port 3 to port 1 energized
B - Port 1 to port 2 de-energized
Model Code

SV1-10-3/3M/3R

SV1 - 10 (V) - 3 (*) - ** - **** *

Function
SV1 – Solenoid valve

Size
10 - 10 Size

Seals
Blank - Buna-N
V - Viton

Style
3 - 3-way

Manual override option
Blank - No manual override
M - Knob type
R - Cable type

Port size
0 - Cartridge only

Code | Port size | Housing number
--- | --- | ---
3B | 3/8" BSPP | 02-173538
6T | SA6 6 | 566162
2G | 1/4" BSPP | 876705
3G | 3/8" BSPP | 876714
6H | SA6 6 | 876704
8H | SA8 8 | 876711

Voltage rating
00 - No coil
12D - 12VDC
24D - 24VDC
36D - 36VDC
24A - 24VAC
120A - 120VAC
240A - 240VAC
12B - 12VDC/w diode*
24B - 24VDC/w diode*

See pages 78 & 79 for housings

Port size
00 - Cartridge only

Voltage
00 - No coil
12D - 12VDC
24D - 24VDC
36D - 36VDC
24A - 24VAC
120A - 120VAC
240A - 240VAC
12B - 12VDC/w diode*
24B - 24VDC/w diode*

*optional arc suppression diode

Dimensions

mm (inch)

19.4 (0.77)
38.9 (1.53)
57.1 (2.25)
46.0 (1.81)
19.0 (0.75) hex
25.4 (1.00) hex
0.875"-14 Thd.
\( \varnothing 15.80 (0.622) \)
\( \varnothing 17.40 (0.685) \)

WARNING

Maintain 5-8 Nm (4-6 lbf ft) maximum torque on valve tube nut. Overtightening may cause valve failure.

For valve dimensions with manual override option installed see page 83
**SV4-10-3/3P/3S**

3-way, 2-position, spool type solenoid valve

**Description**

The SV4-10-3 is a 3-way, 2-position, direct acting, spool type, screw-in cartridge solenoid valve.

**Operation**

In the de-energized position, this valve allows flow from port 2 to port 1 while port 3 is blocked. In the energized position, flow is allowed from port 2 to port 3 while port 1 is blocked.

**Ratings and specifications**

*Performance data is typical with fluid at 21.8 cSt (105 SUS) and 49°C (120°F)*

- Typical application pressure (all ports) ........................................ 210 bar (3000 psi)
- Cartridge fatigue pressure (infinite life) ........................................ 210 bar (3000 psi)
- Rated flow ................................................................. 23 l/min (6 USgpm)
- Internal leakage ................ 164 cm³/min. (10 in³/min) maximum @ 210 bar (3000 psi)
- Temperature range .................. ~40 to 120°C (~40°C to 248°F)
- Coil duty .......................... Continuous from 85% to 110% nominal voltage
- Cavity ............................................. C-10-3 (See page 75)
- Fluids ............................... All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
- Filtration ........................................... Cleanliness code 18/16/13
- Standard housing material ........................................ Aluminum
- Weight including coil .................... 0.42 kg (0.93 lb.)
- Seal kit .............................................. 565804 Buna-N 889599 (Viton®)

Viton is a registered trademark of E.I. DuPont Co.

**Pressure Drop Curves**

Cartridge only

![Pressure Drop Curves](image)

- A - Port 3 to port 2 energized
- B - Port 1 to port 2 de-energized
- C - Port 2 to port 1 de-energized
**Model Code**  
**SV4-10-3P/3S**

### Connector types

<table>
<thead>
<tr>
<th>Style</th>
<th>Manual override option</th>
<th>Seals</th>
<th>Size</th>
<th>Port size</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SV4 – Solenoid valve</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Dimensions

<table>
<thead>
<tr>
<th>Dimensions (mm (inch))</th>
<th>19.4 (0.77)</th>
<th>38.9 (1.53)</th>
<th>46.0 (1.81)</th>
<th>8.6 (0.34)</th>
</tr>
</thead>
</table>

### Valve Specifications

- **Function**: SV4 – Solenoid valve
- **Size**: 10 - 10 Size
- **Seals**: Blank - Buna-N, V - Viton
- **Style**: 3 - 3-way

### Manual override option

<table>
<thead>
<tr>
<th>Blank</th>
<th>No manual override</th>
<th>Push type</th>
<th>Screw type</th>
</tr>
</thead>
</table>

### Voltage rating

<table>
<thead>
<tr>
<th>Code</th>
<th>Port size</th>
<th>Housing number</th>
</tr>
</thead>
<tbody>
<tr>
<td>3B</td>
<td>3/8&quot; BSPP</td>
<td>02-173358</td>
</tr>
<tr>
<td>6T</td>
<td>SAE 6</td>
<td>566162</td>
</tr>
<tr>
<td>2G</td>
<td>1/4&quot; BSPP</td>
<td>876705</td>
</tr>
<tr>
<td>3G</td>
<td>3/8&quot; BSPP</td>
<td>876714</td>
</tr>
<tr>
<td>6H</td>
<td>SAE 6</td>
<td>876704</td>
</tr>
<tr>
<td>8H</td>
<td>SAE 8</td>
<td>876711</td>
</tr>
</tbody>
</table>

### Port size

<table>
<thead>
<tr>
<th>Code</th>
<th>Port size</th>
<th>Housing number</th>
</tr>
</thead>
<tbody>
<tr>
<td>3B</td>
<td>3/8&quot; BSPP</td>
<td>02-173358</td>
</tr>
<tr>
<td>6T</td>
<td>SAE 6</td>
<td>566162</td>
</tr>
<tr>
<td>2G</td>
<td>1/4&quot; BSPP</td>
<td>876705</td>
</tr>
<tr>
<td>3G</td>
<td>3/8&quot; BSPP</td>
<td>876714</td>
</tr>
<tr>
<td>6H</td>
<td>SAE 6</td>
<td>876704</td>
</tr>
<tr>
<td>8H</td>
<td>SAE 8</td>
<td>876711</td>
</tr>
</tbody>
</table>

### Connector types

- Blank - No coil
- P - Push type
- S - Screw type

### Manual override option

- Blank - No manual override
- P - Push type
- S - Screw type

### Manual override option

- Blank - No manual override
- P - Push type
- S - Screw type

### WARNING

Maintain 5-8 Nm (4-6 lb ft) maximum torque on valve tube nut. Overtightening may cause valve failure.

---

45
SV1-8-4/4M
4-way, 2-position, spool type solenoid valve

**Description**

The SV1-8-4 is a 4-way, 2-position, direct acting, spool type solenoid valve.

**Operation**

In the de-energized position, the SV1-8-4 allows flow from port 4 to port 1, and from port 3 to port 2. In the energized position, flow is allowed from port 3 to port 4, and from port 2 to port 1.

**Ratings and specifications**

*Performance data is typical with fluid at 21.8 cSt (105 SUS) and 49°C (120°F)*

- Typical application pressure (all ports) ........................................... 210 bar (3000 psi)
- Cartridge fatigue pressure (infinite life) ............................................. 210 bar (3000 psi)
- Rated flow .......................................................... 11 l/min (3 USgpm)
- Internal leakage (per land) ........................................ 82 cm³/min. (5 in³/min.) maximum @ 210 bar (3000 psi)
- Temperature range .................................................. −40 to 120°C (−40°F to 248°F)
- Coil duty .......................................................... Continuous from 85% to 110% of nominal voltage
- Cavity .................................................. C-8-4 (See page 75)
- Fluids .......................................................... All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
- Filtration .......................................................... Cleanliness code 18/16/13
- Standard housing material .................................................. Aluminum
- Weight including coil .................................................. 0,31 kg (0.69 lb.)
- Seal kit .......................................................... 02-160757 Buna-N
  02-160758 Viton®

Viton is a registered trademark of E.I. DuPont Co.

**Pressure Drop Curves**

*Cartridge only*

<table>
<thead>
<tr>
<th>Flow in lpm (21.8 cSt oil @ 49°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Flow in USgpm (105 SUS oil @ 120°F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td>0</td>
</tr>
</tbody>
</table>

- A - Port 3 to port 4 or port 3 to port 2
- B - Port 4 to 1
- C - Port 2 to 1
### Model Code

**SV1-8-4/4M**

#### Function

**SV1** – Solenoid valve

#### Size

8 - 8 Size

#### Seals

- Blank - Buna-N
- **V** - Viton

#### Style

4 - 4-way

#### Manual override option

- Blank - No manual override
- **M** - Manual override

#### Valve housing material

- Omit for cartridge only
- **A** - Aluminum

#### Port size

- **0** - Cartridge only

<table>
<thead>
<tr>
<th>Code</th>
<th>Port size</th>
<th>Housing number</th>
</tr>
</thead>
<tbody>
<tr>
<td>2G</td>
<td>1/4&quot; BSPP</td>
<td>02-160747</td>
</tr>
<tr>
<td>3G</td>
<td>3/8&quot; BSPP</td>
<td>02-160748</td>
</tr>
<tr>
<td>4T</td>
<td>SAE 4</td>
<td>02-160749</td>
</tr>
<tr>
<td>6T</td>
<td>SAE 6</td>
<td>02-160750</td>
</tr>
</tbody>
</table>

See page 79 for housings

#### Connector types

- **Blank** - No coil

<table>
<thead>
<tr>
<th>Voltage</th>
<th>G-ISO 4400 DIN 43650</th>
<th>P - 1/2&quot; NPT conduit port w/ leadwire</th>
<th>Q - Spade terminals</th>
<th>W - Leadwire</th>
<th>N - Deutsch (DC only)</th>
<th>Y - Amp JR (DC only)</th>
</tr>
</thead>
<tbody>
<tr>
<td>12D</td>
<td>02-160690</td>
<td>02-160684</td>
<td>02-160681</td>
<td>02-160678</td>
<td>02-160958</td>
<td>02-178001</td>
</tr>
<tr>
<td>24D</td>
<td>02-160691</td>
<td>02-160685</td>
<td>02-160682</td>
<td>02-160679</td>
<td>02-160959</td>
<td>02-178002</td>
</tr>
<tr>
<td>36D</td>
<td>02-160692</td>
<td>02-160686</td>
<td>02-160683</td>
<td>02-160680</td>
<td>02-160960</td>
<td>02-178003</td>
</tr>
<tr>
<td>24A</td>
<td>02-160702</td>
<td>02-160699</td>
<td>02-160696</td>
<td>02-160693</td>
<td></td>
<td></td>
</tr>
<tr>
<td>120A</td>
<td>02-160703</td>
<td>02-160700</td>
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<td>240A</td>
<td>02-160704</td>
<td>02-160701</td>
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<td></td>
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<tr>
<td>12B</td>
<td>02-178810</td>
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<td>02-178804</td>
<td>02-178802</td>
<td>02-160953</td>
<td>02-160957</td>
</tr>
<tr>
<td>24B</td>
<td>02-178811</td>
<td></td>
<td>02-178805</td>
<td>02-178803</td>
<td>02-178812</td>
<td>02-178815</td>
</tr>
</tbody>
</table>

#### Series coil

- S - 8-series coil

#### Dimensions

**mm (inch)**

<image of diagram>

#### Note

- When solenoid valve is ordered as cartridge only, nut is included.

- For valve dimensions with manual override option installed see page 83

#### Warning

- Maintain 5-8 Nm (4-6 lbf ft) maximum torque on valve tube nut. Over tightening may cause valve failure.
**SV2-8-4/4M**

4-way, 2-position, spool type solenoid valve

### Description

The SV2-8-4 is a four-way, two-position, direct acting, spool-type solenoid valve.

### Operation

The SV2-8-4 has all ports blocked in the de-energized position. In the energized position, flow is allowed from port 2 to port 1, and from port 3 to port 4.

### Ratings and specifications

*Performance data is typical with fluid at 21.8 cSt (105 SUS) and 49°C (120°F)*

- Typical application pressure (all ports) ............... 210 bar (3000 psi)
- Cartridge fatigue pressure (infinite life) ............... 210 bar (3000 psi)
- Rated flow ................................................. 13 l/min (4 USgpm)
- Internal leakage (per land) ............. 82 cm³/min. (5 in³/min.) maximum @ 210 bar (3000 psi)
- Temperature range .................. –40 to 120°C (~–40°F to 248°F)
- Coil duty ................................................. Continuous from 85% to 110% of nominal voltage
- Response times (100% rated voltage and 100% rated flow) .......... Energize: 21 ms
- De-energize: 42 ms
- Cavity ................................................. C-8-4 (See page 75)
- Fluids ................................................. All general purpose hydraulic fluids such as:
  - MIL-H-5606, SAE 10, SAE 20, etc.
- Filtration ................................................. Cleanliness code 18/16/13
- Standard housing material ......................... Aluminum
- Weight including coil ...................................... 0,30 kg (0,66 lb.)
- Seal kit ................................................. 02-160757 Buna-N
  02-160758 Viton®

Viton is a registered trademark of E.I. DuPont Co.

### Pressure Drop Curves

*Cartridge only*

![Pressure Drop Curves](image-url)

- **A** - Port 3 to port 4
- **B** - Port 2 to port 1
**Model Code**  
**SV2-8-4/4M**

### Function

SV2 – Solenoid valve

### Size

8 - 8 Size

### Seals

Blank - Buna-N  
V - Viton

### Style

4 - 4-way

### Manual override option

Blank - No manual override  
M - Manual override

### Valve housing material

Omit for cartridge only  
A - Aluminum

## Ports

### Port size

<table>
<thead>
<tr>
<th>Code</th>
<th>Port size</th>
<th>Housing number</th>
</tr>
</thead>
<tbody>
<tr>
<td>2G</td>
<td>1/4” BSPP</td>
<td>02-160747</td>
</tr>
<tr>
<td>3G</td>
<td>3/8” BSPP</td>
<td>02-160748</td>
</tr>
<tr>
<td>4T</td>
<td>SAE 4</td>
<td>02-160749</td>
</tr>
<tr>
<td>6T</td>
<td>SAE 6</td>
<td>02-160750</td>
</tr>
</tbody>
</table>

See page 79 for housings

### Voltage rating

<table>
<thead>
<tr>
<th>Code</th>
<th>Voltage rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>No coil</td>
</tr>
<tr>
<td>12D</td>
<td>12VDC</td>
</tr>
<tr>
<td>24D</td>
<td>24VDC</td>
</tr>
<tr>
<td>36D</td>
<td>36VDC</td>
</tr>
<tr>
<td>24A</td>
<td>24VAC</td>
</tr>
<tr>
<td>120A</td>
<td>120VAC</td>
</tr>
<tr>
<td>240A</td>
<td>240VAC</td>
</tr>
<tr>
<td>12B</td>
<td>12VDC/w diode*</td>
</tr>
<tr>
<td>24B</td>
<td>24VDC/w diode*</td>
</tr>
</tbody>
</table>

*optional arc suppression diode

### Connector types

- No coil

### Dimensions

See page 79 for housings

**Note**  
When solenoid valve is ordered as cartridge only, nut is included.

For valve dimensions with manual override option installed see page 83

**WARNING**  
Maintain 5-8 Nm (4-6 lbf ft) maximum torque on valve tube nut. Overtightening may cause valve failure.
**SV1-10-4/4M/4R**

4-way, 2-position, spool type solenoid valve

**Description**

The SV1-10-4 is a 4-way, 2-position, direct acting, spool type, screw-in cartridge solenoid valve.

**Operation**

In the de-energized position, this valve allows flow from port 2 to port 3 and from port 4 to port 1. In the energized position, flow is allowed from port 3 to port 4 and from port 4 to port 1.

**Ratings and specifications**

*Performance data is typical with fluid at 21.8 cSt (105 SUS) and 49°C (120°F)*

- Typical application pressure (all ports) ............... 210 bar (3000 psi)
- Cartridge fatigue pressure (infinite life) ................... 210 bar (3000 psi)
- Rated flow .......................................................... 23 l/min (6 USgpm)
- Internal leakage ............................. 164 cm³/min. (10 in³/min) maximum @ 210 bar (3000 psi)
- Temperature range ...................... −40 to 120°C (−40°F to 248°F)
- Coil duty .............................................................. Continuous from 85% to 110% nominal voltage
- Cavity .......................................................... C-10-4 (See page 75)
- Fluids .......................................................... All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
- Filtration .............................................................. Cleanliness code 18/16/13
- Standard housing material ........................................ Aluminum
- Weight including coil .................. 0.44 kg (0.96 lb.)
- Seal kit .......................................................... 565805 Buna-N 889600 Viton®

*Viton is a registered trademark of E.I. DuPont Co.*

**Pressure Drop Curves**

Cartridge only

**Flow in lpm (21.8 cSt oil @ 49°C)**

<table>
<thead>
<tr>
<th>Flow in lpm</th>
<th>Pressure Drop psi</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>15</td>
</tr>
<tr>
<td>10</td>
<td>30</td>
</tr>
<tr>
<td>15</td>
<td>45</td>
</tr>
<tr>
<td>20</td>
<td>60</td>
</tr>
</tbody>
</table>

**Flow in US gpm (105 SUS oil @ 120°F)**

<table>
<thead>
<tr>
<th>Flow in US gpm</th>
<th>Pressure Drop bar</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
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<tr>
<td>2</td>
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<tr>
<td>3</td>
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<tr>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>6</td>
</tr>
</tbody>
</table>

**A** - Port 4 to port 1

**B** - Port 3 to port 2
Model Code

SV1-10-4/4M/4R

SV1-10 (V) - 4 (*) - ** - **** *

Function
SV1 – Solenoid valve

Size
10 - 10 Size

Seals
Blank - Buna-N
V - Viton

Style
4 - 4-way

Manual override option
Blank - No manual override
M - Knob type
R - Cable type

Port size
Code  Port size  Housing number
3B  3/8” BSPP  02-179705
6T  SAE 6  566161
2G  1/4” BSPP  876709
3G  3/8” BSPP  876715
6H  SAE 6  876708
8H  SAE 8  876713

Voltage rating
00 – No coil
12D - 12VDC
24D - 24VDC
36D - 36VDC
24A - 24VAC
120A - 120VAC
240A - 240VAC
12B - 12VDC/w diode*
24B - 24VDC/w diode*

Optional arc suppression diode

Dimensions
mm (inch)

19,4 (0.77) 46,0 (1.81) 8,6 (0.34)
38,9 (1.53)
19,0 (0.75) hex
57,1 (2.25)
25,4 (1.00) hex
62,0 (2.44)
Ø15,80 (0.622)
Ø17,40 (0.685)
Ø18,97 (0.747)

Torque cartridge in housing
47-54 Nm (35-40 lbf ft)

Valve is shown with “W” coil.
See other coils on page 81.

Note
When solenoid valve is ordered as cartridge only, nut is included.

For valve dimensions with manual override option installed see page 83

WARNING

Maintain 5-8 Nm (4-6 lbf ft) maximum torque on valve tube nut.
Overtightening may cause valve failure.

Torque cartridge in housing
47-54 Nm (35-40 lbf ft)

Valve is shown with “W” coil.
See other coils on page 81.

Note
When solenoid valve is ordered as cartridge only, nut is included.

For valve dimensions with manual override option installed see page 83

WARNING

Maintain 5-8 Nm (4-6 lbf ft) maximum torque on valve tube nut.
Overtightening may cause valve failure.
SV2-10-4/4M/4R
4-way, 2-position, spool type solenoid valve

Description
The SV2-10-4 is a 4-way, 2-position, direct acting, spool type screw-in cartridge solenoid valve.

Operation
In the de-energized position, all ports are blocked. In the energized position, port 3 is open to port 4 and port 2 is open to port 1.

Ratings and specifications

Performance data is typical with fluid at 21.8 cSt (105 SUS) and 49°C (120°F)

Typical application pressure (all ports) ......................... 210 bar (3000 psi)
Cartridge fatigue pressure (infinite life) ......................... 210 bar (3000 psi)
Rated flow .................................................. 23 l/min (6 USgpm)
Internal leakage .................. 164 cm³/min. (10 in³/min) maximum @ 210 bar (3000 psi)
Temperature range ...................... –40 to 120°C (–40° to 248°F)
Coil duty .................................. Continuous from 85% to 110% nominal voltage
Cavity ........................................ C-10-4 (See page 75)
Fluids ...................................... All general purpose hydraulic fluids such as:
                              MIL-H-5606, SAE 10, SAE 20, etc.
Filtration ..................................... Cleanliness code 18/16/13
Standard housing material ......................... Aluminum
Weight including coil ............................... 0.44 kg (0.96 lb.)
Seal kit ........................................ 565805 Buna-N 889600 Viton®

Viton is a registered trademark of E.I. DuPort Co.

Pressure Drop Curves
Cartridge only
Model Code

SV2-10-4/4M/4R

### Function
SV2 – Solenoid valve

### Size
10 – 10 Size

### Seals
Blank – Buna-N
V – Viton

### Style
4 – 4-way

### Manual override option
Blank – No manual override
M – Knob type
R – Cable type

### Port size
<table>
<thead>
<tr>
<th>Code</th>
<th>Port size</th>
<th>Housing number</th>
</tr>
</thead>
<tbody>
<tr>
<td>3B</td>
<td>3/8” BSPP</td>
<td>02-179705</td>
</tr>
<tr>
<td>6T</td>
<td>SAE 6</td>
<td>566161</td>
</tr>
<tr>
<td>2G</td>
<td>1/4” BSPP</td>
<td>876709</td>
</tr>
<tr>
<td>3G</td>
<td>3/8” BSPP</td>
<td>876715</td>
</tr>
<tr>
<td>6H</td>
<td>SAE 6</td>
<td>876708</td>
</tr>
<tr>
<td>8H</td>
<td>SAE 8</td>
<td>876713</td>
</tr>
</tbody>
</table>

### Connector types
Blank – No coil

### Voltage rating
<table>
<thead>
<tr>
<th>Voltage</th>
<th>Housing number</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>No coil</td>
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<tr>
<td>12D</td>
<td>12VDC</td>
</tr>
<tr>
<td>24D</td>
<td>24VDC</td>
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<tr>
<td>36D</td>
<td>36VDC</td>
</tr>
<tr>
<td>24A</td>
<td>24VAC</td>
</tr>
<tr>
<td>120A</td>
<td>120VAC</td>
</tr>
<tr>
<td>240A</td>
<td>240VAC</td>
</tr>
<tr>
<td>12B</td>
<td>12VDC/w diode*</td>
</tr>
<tr>
<td>24B</td>
<td>24VDC/w diode*</td>
</tr>
</tbody>
</table>

### Dimensions

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>mm (inch)</th>
</tr>
</thead>
<tbody>
<tr>
<td>19.4 (0.77)</td>
<td>38.9 (1.53)</td>
</tr>
<tr>
<td>46.0 (1.81)</td>
<td>8.6 (0.34)</td>
</tr>
</tbody>
</table>

Torque cartridge in housing 47-54 Nm (35-40 lbf ft)

Valve is shown with “W” coil. See other coils on page 81.

Note
When solenoid valve is ordered as cartridge only, nut is included.

For valve dimensions with manual override option installed see page 83

⚠️ WARNING

Maintain 5-8 Nm (4-6 lbf ft) maximum torque on valve tube nut. Overtightening may cause valve failure.
SV3-10-4/4M/4R
4-way, 2-position, spool type solenoid valve

Description
The SV3-10-4 is a 4-way, 2-position, direct acting, spool type, screw-in cartridge solenoid valve.

Operation
In the de-energized position, port 3 is open to port 4 and port 2 is open to port 1. In the energized position all ports are blocked.

Ratings and specifications
Performance data is typical with fluid at 21,8 cSt (105 SUS) and 49°C (120°F)
Typical application pressure (all ports) ................. 210 bar (3000 psi)
Cartridge fatigue pressure (infinite life) ................. 210 bar (3000 psi)
Rated flow ............................................ 23 l/min (6 USgpm)
Internal leakage .................... 164 cm³/min. (10 in³/min) maximum @ 210 bar (3000 psi)
Temperature range ...................... –40 to 120°C (–40° to 248°F)
Coil duty ........................................... Continuous from 85% to 110% nominal voltage
Cavity .................................................. C-10-4 (See page 75)
Fluids ............................................... All general purpose hydraulic fluids such as:
MIL-H-5606, SAE 10, SAE 20, etc.
Filtration .......................................... Cleanliness code 18/16/13
Standard housing material ......................... Aluminum
Weight including coil ............................ 0.44 kg (0.96 lb.)
Seal kit .............................................. 565805 Buna-N 889600 Viton®
Viton is a registered trademark of E.I. DuPont Co.

Pressure Drop Curves
Cartridge only

A-Port 3 to port 4
B-Port 1 to port 2
**Model Code SV3-10-4/4M/4R**

**Function**
SV3 – Solenoid valve

**Size**
10 - 10 Size

**Seals**
Blank - Buna-N
V - Viton

**Style**
4 - 4-way

**Manual override option**
Blank - No manual override
M - Knob type
R - Cable type

**PORT SIZE**

<table>
<thead>
<tr>
<th>Code</th>
<th>Port size</th>
<th>Housing number</th>
</tr>
</thead>
<tbody>
<tr>
<td>3B</td>
<td>3/8” BSPP</td>
<td>02-178705</td>
</tr>
<tr>
<td>6T</td>
<td>SAE 6</td>
<td>566161</td>
</tr>
<tr>
<td>2G</td>
<td>1/4” BSPP</td>
<td>876709</td>
</tr>
<tr>
<td>3G</td>
<td>3/8” BSPP</td>
<td>876708</td>
</tr>
<tr>
<td>6H</td>
<td>SAE 8</td>
<td>876713</td>
</tr>
</tbody>
</table>

**Connector types**

<table>
<thead>
<tr>
<th>Voltage rating</th>
<th>Code</th>
<th>Housing number</th>
</tr>
</thead>
<tbody>
<tr>
<td>00 - No coil</td>
<td>02-178063</td>
<td></td>
</tr>
<tr>
<td>12D - 12VDC</td>
<td>02-178065</td>
<td></td>
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<tr>
<td>24D - 24VDC</td>
<td>02-178066</td>
<td></td>
</tr>
<tr>
<td>36D - 36VDC</td>
<td>02-178067</td>
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<td>24A - 24VAC</td>
<td>02-178069</td>
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<td>120A - 120VAC</td>
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<tr>
<td>240A - 240VAC</td>
<td>02-178072</td>
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</tr>
<tr>
<td>12B - 12VDC/w diode*</td>
<td>02-178073</td>
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</tr>
<tr>
<td>24B - 24VDC/w diode*</td>
<td>02-178074</td>
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</tbody>
</table>

*optional arc suppression diode

**Dimensions**

<table>
<thead>
<tr>
<th>Dimensions (mm)</th>
<th>19.4 (0.77)</th>
<th>38.9 (1.53)</th>
<th>46.0 (1.81)</th>
<th>8.6 (0.34)</th>
<th>19.0 (0.75) hex</th>
<th>57.1 (2.25)</th>
<th>62.0 (2.44)</th>
<th>∅ 15.80 (0.622)</th>
<th>∅ 17.40 (0.685)</th>
<th>∅ 18.97 (0.747)</th>
</tr>
</thead>
</table>

Torque cartridge in housing 47-54 Nm (35-40 lbf ft)

Valve is shown with “W” coil. See other coils on page 81.

*WARNING*

Maintain 5-8 Nm (4-6 lbf ft) maximum torque on valve tube nut. Over tightening may cause valve failure.
SV4-10-4/4M/4R
4-way, 2-position, spool type solenoid valve

Description
The SV4-10-4 is a 4-way, 2-position, direct acting, spool type, screw-in cartridge solenoid valve.

Operation
In the de-energized position, flow is allowed between port 1 and port 4 while port 2 and port 3 are blocked. In the energized position port 3 is open to port 4 and port 2 is open to port 1.

Ratings and specifications
Performance data is typical with fluid at 21.8 cSt (105 SUS) and 49°C (120°F)
Typical application pressure (all ports) .................. 210 bar (3000 psi)
Cartridge fatigue pressure (infinite life) .................. 210 bar (3000 psi)
Rated flow .................................................. 23 l/min (6 USgpm)
Internal leakage ................. 164 cm³/min. (10 in³/min) maximum @ 210 bar (3000 psi)
Temperature range ....................... −40 to 120°C (−40° to 248°F)
Coil duty ..................... Continuous from 85% to 110% nominal voltage
Cavity ..................... All general purpose hydraulic fluids such as:
Fluids .................. MIL-H-5606, SAE 10, SAE 20, etc.
Filtration .................. Cleanliness code 18/16/13
Standard housing material .................. Aluminum
Weight including coil .................. 0.44 kg (0.96 lb.)
Seal kit .................. 565805 Buna-N 889600 Viton®

Viton is a registered trademark of E.I. DuPont Co.

Pressure Drop Curves
Cartridge only

Flow in lpm (21.8 cSt oil @ 49°C)
Flow in USgpm (105 SUS oil @ 120°F)
Model Code
SV4-10-4/4M/4R

<table>
<thead>
<tr>
<th>Function</th>
<th>Port size</th>
<th>Voltage rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>SV4 – Solenoid valve</td>
<td>0 - Cartridge only</td>
<td>00 - No coil</td>
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<td>Size 10</td>
<td>3B 3/8&quot; BSPP</td>
<td>12D - 12VDC</td>
</tr>
<tr>
<td>Seals Blank - Buna-N</td>
<td>6T SAE 6</td>
<td>24D - 24VDC</td>
</tr>
<tr>
<td>Style 4</td>
<td>2G 1/4&quot; BSPP</td>
<td>36D - 36VDC</td>
</tr>
<tr>
<td></td>
<td>6H SAE 6</td>
<td>120A - 120VAC</td>
</tr>
<tr>
<td></td>
<td>8H SAE 8</td>
<td>240A - 240VAC</td>
</tr>
<tr>
<td></td>
<td></td>
<td>12B - 12VDC/w diode*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>24B - 24VDC/w diode*</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dimensions mm (inch)</th>
<th>8.6 (0.34)</th>
<th>Torque cartridge in housing 47-54 Nm (35-40 lbf ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>46.0 (1.81)</td>
<td></td>
<td>Valve is shown with &quot;W&quot; coil. See other coils on page 81.</td>
</tr>
<tr>
<td>38.9 (1.53)</td>
<td></td>
<td>Note: When solenoid valve is ordered as cartridge only, nut is included.</td>
</tr>
<tr>
<td>57.1 (2.25)</td>
<td></td>
<td>For valve dimensions with manual override option installed see page 83</td>
</tr>
</tbody>
</table>

WARNING
Maintain 5-8 Nm (4-6 lbf ft) maximum torque on valve tube nut. Overtightening may cause valve failure.
SV5-10-4/4M/4R
4-way, 2-position, spool type solenoid valve

Description
The SV5-10-4 is a 4-way, 2-position, direct acting, spool type, screw-in cartridge solenoid valve.

Operation
In the de-energized position, all ports are blocked. In the energized position port 2 is open to port 3 and port 1 is open to port 4.

Ratings and specifications
*Performance data is typical with fluid at 21.8 cSt (105 SUS) and 49°C (120°F)*
- Typical application pressure (all ports) ................. 210 bar (3000 psi)
- Cartridge fatigue pressure (infinite life) ................. 210 bar (3000 psi)
- Rated flow ................................................. 23 l/min (6 USgpm)
- Internal leakage ........................................... 164 cm³/min. (10 in³/min) maximum @ 210 bar (3000 psi)
- Temperature range .......................................... −40 to 120°C (−40° to 248°F)
- Coil duty ...................................................... Continuous from 85% to 110% nominal voltage
- Cavity ......................................................... C-10-4 (See page 75)
- Fluids ......................................................... All general purpose hydraulic fluids such as:
  - MIL-H-5606, SAE 10, SAE 20, etc.
- Filtration ..................................................... Cleanliness code 18/16/13
- Standard housing material ................................... Aluminum
- Weight including coil ....................................... 0.44 kg (0.96 lb.)
- Seal kit ....................................................... 565805 Buna-N 889600 Viton®

Viton is a registered trademark of E.I. DuPont Co.

Pressure Drop Curves
Cartridge only

Flow in lpm (21.8 cSt oil @ 49°C)

Flow in USgpm (105 SUS oil @ 120°F)
**Model Code**

**SV5-10-4/4M/4R**

---

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<th>5</th>
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<th>7</th>
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<tbody>
<tr>
<td><strong>Function</strong></td>
<td><strong>Port size</strong></td>
<td><strong>Voltage rating</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SV5 – Solenoid valve</td>
<td>0 - Cartridge only</td>
<td>00 - No coil</td>
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<td>12D - 12VDC</td>
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<tr>
<td><strong>Size</strong></td>
<td>Code</td>
<td>Housing number</td>
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<tr>
<td>10 - 10 Size</td>
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<tr>
<td><strong>Seals</strong></td>
<td>Port size</td>
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</tr>
<tr>
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<td>2G</td>
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<td>6H</td>
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</tr>
<tr>
<td><strong>Style</strong></td>
<td>Spade terminals</td>
<td>See pages 78 &amp; 79 for housings</td>
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</tr>
<tr>
<td>4 - 4-way</td>
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<tr>
<td><strong>Manual override option</strong></td>
<td><strong>Connector types</strong></td>
<td><em>optional arc suppression diode</em></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Blank - No manual override</td>
<td><strong>Blank - No coil</strong></td>
<td></td>
<td></td>
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<tr>
<td>M - Knob type</td>
<td>G - ISO 4400 DIN 43650</td>
<td>00 - No coil</td>
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<tr>
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<td>P - 1/2” NPT conduit port w/ leadwire</td>
<td>12D - 12VDC</td>
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<td>Q - Spade terminals</td>
<td>24D - 24VDC</td>
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<td>Y - Amp JR (DC only)</td>
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</tr>
</tbody>
</table>

**Dimensions**

mm (inches)

- 19.4 (0.77)
- 38.9 (1.53)
- 46.0 (1.81)
- 57.1 (2.25)
- 62.0 (2.44)
- 15.80 (0.622)
- 17.40 (0.685)
- 18.97 (0.747)
- 19.0 (0.75)
- 25.4 (1.00)
- 8.6 (0.34)

**Note**

When solenoid valve is ordered as cartridge only, nut is included.

For valve dimensions with manual override option installed see page 83

**WARNING**

Maintain 5-8 Nm (4-6 lbf ft) maximum torque on valve tube nut. Over tightening may cause valve failure.

---

Valve is shown with "W" coil.

See other coils on page 81.

For valve dimensions with manual override option installed see page 83.
SV7-10-4/4P/4S
4-way, 2-position, spool type solenoid valve

Description
The SV7-10-4 is a 4-way, 2-position, direct acting, spool type, screw-in cartridge solenoid valve.

Operation
In the de-energized position, port 3 is open to port 4 and port 2 is open to port 1.

Ratings and specifications

Performance data is typical with fluid at 21.8 cSt (105 SUS) and 49°C (120°F)

- Typical application pressure (all ports) ................. 210 bar (3000 psi)
- Cartridge fatigue pressure (infinite life) ................. 210 bar (3000 psi)
- Rated flow ........................................ 17 l/min (5 USgpm)
- Internal leakage .................. 164 cm³/min. (10 in³/min) maximum @ 210 bar (3000 psi)
- Temperature range .................. –40 to 120°C (–40°F to 248°F)
- Coil duty ........................................ Continuous from 85% to 110% nominal voltage
- Cavity ........................................ C-10-4 (See page 75)
- Fluids ........................................ All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
- Filtration ........................................ Cleanliness code 18/16/13
- Standard housing material ............................... Aluminum
- Weight including coil ................................. 0.44 kg (0.96 lb.)
- Seal kit ........................................ 565805 Buna-N 889600 Viton®

Viton is a registered trademark of E.I. DuPont Co.

Pressure Drop Curves
Cartridge only

Flow in lpm (21.8 cSt oil @ 49°C)

A - Port 4 to port 1 energized
B - Port 3 to port 2 energized
C - Port 3 to port 4 energized
D - Port 2 to port 1 de-energized

Flow in USgpm (105 SUS oil @ 120°F)
Model Code

SV7-10-4/4P/4S

1 Function
SV7 – Solenoid valve

2 Size
10 - 10 Size

3 Seals
Blank - Buna-N
V - Viton

4 Style
4 - 4-way

5 Manual override option
Blank - No manual override
P - Push type
S - Screw type

6 Port size
0 - Cartridge only

<table>
<thead>
<tr>
<th>Code</th>
<th>Port size</th>
<th>Housing number</th>
</tr>
</thead>
<tbody>
<tr>
<td>3B</td>
<td>3/8&quot; BSPP</td>
<td>02-179705</td>
</tr>
<tr>
<td>6T</td>
<td>SA6</td>
<td>566161</td>
</tr>
<tr>
<td>2G</td>
<td>1/4&quot; BSPP</td>
<td>876709</td>
</tr>
<tr>
<td>3G</td>
<td>3/8&quot; BSPP</td>
<td>876715</td>
</tr>
<tr>
<td>6H</td>
<td>SA6</td>
<td>876708</td>
</tr>
<tr>
<td>8H</td>
<td>SA8</td>
<td>876713</td>
</tr>
</tbody>
</table>

See pages 78 & 79 for housings

7 Voltage rating
00 - No coil
12D - 12VDC
24D - 24VDC
36D - 36VDC
24A - 24VAC
120A - 120VAC
240A - 240VAC
12B - 12VDC/w diode*
24B - 24VDC/w diode*

*optional arc suppression diode

8 Connector types
Blank - No coil

<table>
<thead>
<tr>
<th>Voltage</th>
<th>G - ISO 4400 DIN 43650</th>
<th>P - 1/2&quot; NPT conduit port w/ leadwire</th>
<th>Q - Spade terminals</th>
<th>W - Leadwire</th>
<th>N - Deutsch (DC only)</th>
<th>Y - Amp JR (DC only)</th>
</tr>
</thead>
<tbody>
<tr>
<td>12D</td>
<td>02-178086</td>
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<td>02-178833</td>
<td>02-178843</td>
<td>02-178846</td>
</tr>
</tbody>
</table>

Dimensions

mm (inch)

- 19.4 (0.77)
- 38.9 (1.53)
- 46.0 (1.81)
- 57.1 (2.25)
- 62.0 (2.44)
- 15.80 (0.622)
- 17.40 (0.685)
- 18.97 (0.747)
- 8.6 (0.34)
- 19.0 (0.75) hex
- 25.4 (1.00) hex
- 0.875"-14 Thd.

Torque cartridge in housing
47-54 Nm (35-40 lbf ft)

Valve is shown with “W” coil.
See other coils on page 81.

Note
When solenoid valve is ordered as cartridge only, nut is included.

For valve dimensions with manual override option installed see page 83

WARNING
Maintain 5-8 Nm (4-6 lbf ft) maximum torque on valve tube nut. Overtightening may cause valve failure.
SV9-10-A
4-way, 3-position, tandem center solenoid valve

Description
The SV9-10-A is a 4-way, 3-position, spool type, tandem center, direct acting, screw-in cartridge solenoid valve.

Operation
In the de-energized position, this valve allows flow from port 3 to port 1 and blocks ports 2 and 4. When solenoid 1 is energized, flow is directed from port 3 to port 2 and from port 4 to port 1. When solenoid 2 is energized, flow is directed from port 3 to port 4 and from port 2 to port 1.

Ratings and specifications
Performance data is typical with fluid at 21.8 cSt (105 SUS) and 49°C (120°F)

Typical application pressure (all ports) ................. 210 bar (3000 psi)
Cartridge fatigue pressure (infinite life) ................. 210 bar (3000 psi)
Rated flow ........................................ 11 l/min (3 USgpm)
Internal leakage .............. 246 cm³/min (15 in³/min) maximum @ 210 bar (3000 psi)
Temperature range .................. −40 to 120°C (−40°F to 248°F)
Coil duty ......................... Continuous from 85% to 110% nominal voltage
Cavity ........................................... C-10-4 (See page 75)
Fluids ........................................ All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
Filtration ........................................ Cleanliness code 18/16/13
Standard housing material ......................... Aluminum
Weight including coil ......................... 0.77 kg (1.70 lb.)
Seal kit ........................................ 889625 Buna-N

Viton is a registered trademark of E.I. DuPont Co.

Pressure Drop Curves
Cartridge only

Flow in lpm (21.8 cSt oil @ 49°C)

A - Port 3 to port 2 or 4
B - Port 2 or 4 to port 1
C - Port 3 to port 1

Flow in USgpm (105 SUS oil @ 120°F)
**Model Code**

**SV9-10-A**

---

**Function**
SV9 – Solenoid valve

**Size**
10 – 10 Size

**Seals**
Blank – Buna-N
V – Viton

**Spool center condition**
A – Tandem center

**Port size**

<table>
<thead>
<tr>
<th>Code</th>
<th>Port size</th>
<th>Housing number</th>
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<tbody>
<tr>
<td>3B</td>
<td>3/8&quot; BSPP</td>
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<td>6T</td>
<td>SAE 6</td>
<td>566161</td>
</tr>
<tr>
<td>2G</td>
<td>1/4&quot; BSPP</td>
<td>876709</td>
</tr>
<tr>
<td>3G</td>
<td>3/8&quot; BSPP</td>
<td>876715</td>
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<tr>
<td>6H</td>
<td>SAE 6</td>
<td>876708</td>
</tr>
<tr>
<td>8H</td>
<td>SAE 8</td>
<td>876713</td>
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</table>

See pages 78 & 79 for housings

**Connector types**

<table>
<thead>
<tr>
<th>Voltage</th>
<th>G – ISO 4400 DIN 43650</th>
<th>P – 1/2&quot; NPT conduit port w/ leadwire</th>
<th>Q – Spade terminals</th>
<th>W – Leadwire</th>
<th>N – Deutsch (DC only)</th>
<th>Y – Amp JR (DC only)</th>
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</thead>
<tbody>
<tr>
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<td>02-178086</td>
<td>02-178078</td>
<td>02-178070</td>
<td>02-178063</td>
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**Dimensions**

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>mm (inch)</th>
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<tbody>
<tr>
<td>19,4 (0.77)</td>
<td>46,0 (1.81)</td>
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<tr>
<td>38,9 (1.53)</td>
<td>8,6 (0.34)</td>
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<td>119,0 (4.68)</td>
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<td>61,9 (2.43)</td>
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<tr>
<td>15,80 (0.622)</td>
<td>0.875&quot;-14 Thd.</td>
</tr>
<tr>
<td>18,97 (0.747)</td>
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<tr>
<td>17,40 (0.685)</td>
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</tr>
</tbody>
</table>

---

**NOTICE**

- Maintain 5-8 Nm (4.6 lbf ft) maximum torque on valve tube nut. Overtightening may cause valve failure.

---

**WARNING**

- Torque cartridge in housing 47-54 Nm (35-40 lbf ft)
- Valve is shown with “W” coil. See other coils on page 81.
- Note
- When solenoid valve is ordered as cartridge only, nut is included.

---

*optional arc suppression diode
SV9-10-B
4-way, 3-position, open center solenoid valve

Description
The SV9-10-B is a 4 way, 3-position, spool type, open center, direct acting, screw-in cartridge solenoid valve.

Operation
In the de-energized position, all ports are open to each other. When solenoid 1 is energized, flow is directed from port 3 to port 4 and from port 2 to port 1. When solenoid 2 is energized, flow is directed from port 3 to port 2 and from port 4 to port 1.

Ratings and specifications
Performance data is typical with fluid at 21.8 cSt (105 SUS) and 49°C (120°F)
Typical application pressure (all ports) ......................... 210 bar (3000 psi)
Cartridge fatigue pressure (infinite life) ......................... 210 bar (3000 psi)
Rated flow ......................................................... 11 l/min (3 USgpm)
Internal leakage ............... 246 cm³/min (15 in³/min) maximum @ 210 bar (3000 psi)
Temperature range .................. −40 to 120°C (−40°F to 248°F)
Coil duty .................. Continuous from 85% to 110% nominal voltage
Cavity .......................... C-10-4 (See page 75)
Fluids ................................................. All general purpose hydraulic fluids such as:
MIL-H-5606, SAE 10, SAE 20, etc.
Filtration ............................................ Cleanliness code 18/16/13
Standard housing material ...................................... Aluminum
Weight including coil ......................................... 0.77 kg (1.70 lb.)
Seal kit ................................................. 889625 Buna-N 566080 Viton®
Viton is a registered trademark of E.I. DuPont Co.

Pressure Drop Curve
Cartridge only

Flow in lpm (21.8 cSt oil @ 49°C)
Flow in USgpm (105 SUS oil @ 120°F)
Model Code
SV9-10-B

Function
SV9 – Solenoid valve

Size
10 – 10 Size

Seals
Blank – Buna-N
V – Viton

Spool center condition
B – Open center

Port size
0 – Cartridge only

<table>
<thead>
<tr>
<th>Code</th>
<th>Port size</th>
<th>Housing number</th>
</tr>
</thead>
<tbody>
<tr>
<td>3B</td>
<td>3/8” BSPP</td>
<td>02-179705</td>
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<tr>
<td>6T</td>
<td>SAE 6</td>
<td>566161</td>
</tr>
<tr>
<td>2G</td>
<td>1/4” BSPP</td>
<td>876709</td>
</tr>
<tr>
<td>3G</td>
<td>3/8” BSPP</td>
<td>876715</td>
</tr>
<tr>
<td>6H</td>
<td>SAE 6</td>
<td>876708</td>
</tr>
<tr>
<td>8H</td>
<td>SAE 8</td>
<td>876713</td>
</tr>
</tbody>
</table>

See pages 78 & 79 for housings

Connector types
Blank – No coil

<table>
<thead>
<tr>
<th>Voltage</th>
<th>G - ISO 4400 DIN 43650</th>
<th>P - 1/2” NPT conduit port w/ leadwire</th>
<th>Q - Spade terminals</th>
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<td>12D</td>
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<td>02-178833</td>
<td>02-178843</td>
<td>02-178846</td>
</tr>
</tbody>
</table>

Dimensions
mm (inch)

19.4 (0.77) 8.6 (0.34) 46.0 (1.81) 19.0 (0.75) hex

Torque cartridge in housing
47-54 Nm (35-40 lbf ft)
Valve is shown with “W” coil.
See other coils on page 81.

Note
When solenoid valve is ordered as cartridge only, nut is included.

WARNING
Maintain 5-8 Nm (4-6 lbf ft) maximum torque on valve tube nut. Overtightening may cause valve failure.
SV9-10-D
4-way, 3-position solenoid valve

Description
The SV9-10-D is a 4-way, 3-position, spool type, direct acting, screw-in cartridge solenoid valve.

Operation
In the de-energized (center) position, port 1, port 3, and port 4 are open to each other while port 2 is blocked. When solenoid 1 is energized, flow is directed from port 3 to port 4 and from port 2 to port 1. When solenoid 2 is energized, flow is directed from port 3 to port 2 and from port 4 to port 1.

Ratings and specifications
Performance data is typical with fluid at 21.8 cSt (105 SUS) and 49°C (120°F)

Typical application pressure (all ports) .................. 210 bar (3000 psi)
Cartridge fatigue pressure (infinite life) .................. 210 bar (3000 psi)
Rated flow ................................................. 11 l/min (3 USgpm)
Internal leakage .............. 246 cm³/min (15 in³/min) maximum @ 210 bar (3000 psi)
Temperature range .................. −40 to 120°C (−40° to 248°F)
Coil duty ........................................... Continuous from 85% to 110% nominal voltage
Cavity ....................................................... C-10-4 (See page 75)
Fluids ........................................... All general purpose hydraulic fluids such as:
MIL-H-5606, SAE 10, SAE 20, etc.
Filtration ........................................... Cleanliness code 18/16/13
Standard housing material ................................ Aluminum
Weight including coil .................. 0.77 kg (1.70 lb.)
Seal kit .................................................. 889625 Buna-N
566080 Viton®
Viton is a registered trademark of E.I. DuPont Co.

Pressure Drop Curves
Cartridge only

A - Port 3 to port 2
port 2 to port 1
B - Port 3 to port 4
port 4 to port 1
Function
SV9 – Solenoid valve

Size
10 - 10 Size

Seals
Blank - Buna-N
V - Viton

Spool center condition
D - Port 1, 3, and 4 open. Port 2 closed.

Port size
0 - Cartridge only

Voltage rating
00 - No coil
12D - 12VDC
24D - 24VDC
36D - 36VDC
24A - 24VAC
120A - 120VAC
240A - 240VAC
12B - 12VDC/w diode*
24B - 24VDC/w diode*

Connector types
Blank - No coil

Dimensions
mm (inch)

Torque cartridge in housing
47-54 Nm (35-40 lbf ft)

Valve is shown with "W" coil.
See other coils on page 81.

Note
When solenoid valve is ordered as cartridge only, nut is included.

WARNING
Maintain 5-8 Nm (4-6 lbf ft)
maximum torque on valve tube nut. Overtightening may cause valve failure.
**Description**

The SV9-10-E is a 4-way, 3-position, spool type, closed center, direct acting, screw-in cartridge solenoid valve.

**Operation**

In the de-energized (center) position, all ports are blocked. When solenoid 1 is energized, flow is directed from port 3 to port 4 and from port 2 to port 1. When solenoid 2 is energized, flow is directed from port 3 to port 2 and from port 4 to port 1.

**Ratings and specifications**

*Performance data is typical with fluid at 21.8 cSt (105 SUS) and 49°C (120°F)*

- Typical application pressure (all ports) .................. 210 bar (3000 psi)
- Cartridge fatigue pressure (infinite life) ................. 210 bar (3000 psi)
- Rated flow .................................................. 11 l/min (3 USgpm)
- Internal leakage ............................ 246 cm³/min (15 in³/min) maximum @ 210 bar (3000 psi)
- Temperature range .............................. −40 to 120°C (−40°F to 248°F)
- Coil duty ............................................. Continuous from 85% to 110% nominal voltage
- Cavity ......................................................... C-10-4 (See page 75)
- Fluids ......................................................... All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
- Filtration ........................................... Cleanliness code 18/16/13
- Standard housing material ......................... Aluminum
- Weight including coil ................................. 0.77 kg (1.70 lb.)
- Seal kit ...................................................... 889625 Buna-N 566080 Viton®

Viton is a registered trademark of E.I. DuPont Co.

---

**Pressure Drop Curve**

**Cartridge only**

<table>
<thead>
<tr>
<th>Flow in lpm (21.8 cSt oil @ 49°C)</th>
<th>Flow in USgpm (105 SUS oil @ 120°F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 4 6 8 10</td>
<td>2 3 4 5 6</td>
</tr>
<tr>
<td>Pressure Drop psi</td>
<td>Pressure Drop bar</td>
</tr>
<tr>
<td>0 15 30 45 60 75 90</td>
<td>1 2 3 4 5 6</td>
</tr>
</tbody>
</table>

Port 3 to port 2 or port 4
Port 2 or port 4 to port 1
**SV9 - 10 (V) - E - **-**** *

<table>
<thead>
<tr>
<th>Function</th>
<th>System</th>
<th>Solenoid valve</th>
</tr>
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<tbody>
<tr>
<td>Size</td>
<td>10</td>
<td>- 10 Size</td>
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<tr>
<td>Seals</td>
<td>Blank</td>
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<tr>
<td></td>
<td>V</td>
<td>Viton</td>
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<tr>
<td>Spool center condition</td>
<td>E</td>
<td>Closed center</td>
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<table>
<thead>
<tr>
<th>Port size</th>
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<th>Housing number</th>
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<td>SAE 8</td>
<td>876713</td>
</tr>
</tbody>
</table>

See pages 78 & 79 for housings

<table>
<thead>
<tr>
<th>Connector types</th>
<th>G - ISO 4400 DIN 43650</th>
<th>P - 1/2” NPT conduit port w/ leadwire</th>
<th>Q - Spade terminals</th>
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<td>02-178842</td>
<td>02-178862</td>
</tr>
<tr>
<td>24B</td>
<td>02-178841</td>
<td>–</td>
<td>02-178835</td>
<td>02-178833</td>
<td>02-178843</td>
<td>02-178846</td>
</tr>
</tbody>
</table>

Dimensions (mm, inch):
- 19.4 (0.77)
- 46.0 (1.81)
- 38.9 (1.53)
- 119.0 (4.68)
- 61.9 (2.43)
- 15.80 (0.622)
- 18.97 (0.747)
- 17.40 (0.685)

Torque cartridge in housing:
- 47-54 Nm (35-40 lbf ft)

Valve is shown with “W” coil.
See other coils on page 81.

Note:
When solenoid valve is ordered as cartridge only, nut is included.

**WARNING**

- Maintain 5-8 Nm (4-6 lbf ft) maximum torque on valve tube nut. Overtightening may cause valve failure.

---

*optional arc suppression diode*
SV9-10-F
4-way, 3-position, motor spool solenoid valve

Description
The SV9-10-F is a 4-way, 3-position, spool type, motor spool, direct acting, screw-in cartridge solenoid valve.

Operation
In the de-energized (center) position, port 1, port 2, and port 4 are open to each other, while port 3 is blocked. When solenoid 1 is energized, flow is directed from port 3 to port 4 and from port 2 to port 1. When solenoid 2 is energized, flow is directed from port 3 to port 2 and from port 4 to port 1.

Ratings and specifications
Performance data is typical with fluid at 21.8 cSt (105 SUS) and 49°C (120°F)

- Typical application pressure (all ports) .................. 210 bar (3000 psi)
- Cartridge fatigue pressure (infinite life) .................. 210 bar (3000 psi)
- Rated flow ............................................. 11 l/min (3 USgpm)
- Internal leakage .......... 246 cm³/min (15 in³/min) maximum @ 210 bar (3000 psi)
- Temperature range ...................... −40 to 120°C (−40° to 248°F)
- Coil duty .......................... Continuous from 85% to 110% nominal voltage
- Cavity ............................................. C-10-4 (See page 75)
- Fluids ............................. All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
- Filtration ......................................... Cleanliness code 18/16/13
- Standard housing material .......................... Aluminum
- Weight including coil .................... 0.77 kg (1.70 lb.)
- Seal kit ........................................... 889625 Buna-N 566080 Viton®

Viton is a registered trademark of E.I. DuPont Co.

Pressure Drop Curve
Cartridge only

Flow in lpm (21.8 cSt oil @ 49°C)

<table>
<thead>
<tr>
<th>Flow in USgpm (105 SUS oil @ 120°F)</th>
<th>Pressure Drop psi</th>
<th>Pressure Drop bar</th>
</tr>
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<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>10</td>
<td>0.7</td>
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<td>6</td>
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<td>40</td>
<td>2.8</td>
</tr>
<tr>
<td>10</td>
<td>50</td>
<td>3.5</td>
</tr>
</tbody>
</table>

Port 1 to port 2 or port 4
Model Code

SV9-10-F

Function
SV9 – Solenoid valve

Size
10 – 10 Size

Seals
Blank - Buna-N
V - Viton

Spool center condition
F - Motor spool

Port size
0 - Cartridge only

<table>
<thead>
<tr>
<th>Code</th>
<th>Port size</th>
<th>Housing number</th>
</tr>
</thead>
<tbody>
<tr>
<td>3B</td>
<td>3/8&quot; BSPP</td>
<td>02-179705</td>
</tr>
<tr>
<td>6T</td>
<td>SAE 6</td>
<td>566161</td>
</tr>
<tr>
<td>2G</td>
<td>1/4&quot; BSPP</td>
<td>876709</td>
</tr>
<tr>
<td>3G</td>
<td>3/8&quot; BSPP</td>
<td>876715</td>
</tr>
<tr>
<td>6H</td>
<td>SAE 6</td>
<td>876708</td>
</tr>
<tr>
<td>8H</td>
<td>SAE 8</td>
<td>876713</td>
</tr>
</tbody>
</table>

See pages 78 & 79 for housings

Connector types
Blank - No coil

<table>
<thead>
<tr>
<th>Voltage</th>
<th>G - ISO 4400 DIN 43650</th>
<th>P - 1/2&quot; NPT conduit port w/ leadwire</th>
<th>Q - Spade terminals</th>
<th>W - Leadwire</th>
<th>N - Deutsch (DC only)</th>
<th>Y - Amp JR (DC only)</th>
</tr>
</thead>
<tbody>
<tr>
<td>12D</td>
<td>02-178086</td>
<td>02-178078</td>
<td>02-178070</td>
<td>02-178063</td>
<td>02-178093</td>
<td>02-178711</td>
</tr>
<tr>
<td>24D</td>
<td>02-178087</td>
<td>02-178079</td>
<td>02-178073</td>
<td>02-178065</td>
<td>02-178094</td>
<td>02-178712</td>
</tr>
<tr>
<td>36D</td>
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<td>02-178075</td>
<td>02-178066</td>
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<tr>
<td>24A</td>
<td>02-178112</td>
<td>02-178104</td>
<td>02-178103</td>
<td>02-178102</td>
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<td></td>
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<tr>
<td>120A</td>
<td>02-178114</td>
<td>02-178106</td>
<td>02-178109</td>
<td>02-178107</td>
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<td></td>
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<tr>
<td>240A</td>
<td>02-178117</td>
<td>02-178109</td>
<td></td>
<td>02-178108</td>
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</tr>
<tr>
<td>12B</td>
<td>02-178840</td>
<td>02-178834</td>
<td>02-178832</td>
<td>02-178842</td>
<td>02-178862</td>
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</tr>
<tr>
<td>24B</td>
<td>02-178841</td>
<td>02-178835</td>
<td>02-178833</td>
<td>02-178843</td>
<td></td>
<td>02-178846</td>
</tr>
</tbody>
</table>

Dimensions

Torque cartridge in housing 47-54 Nm (35-40 lbf ft)
Valve is shown with "W" coil.
See other coils on page 81.

Note
When solenoid valve is ordered as cartridge only, nut is included.

WARNING
Maintain 5-8 Nm (4-6 lbf ft) maximum torque on valve tube nut. Over tightening may cause valve failure.
Description

The SV9-10-G is a 4-way, 3-position, spool type, direct acting screw-in cartridge solenoid valve.

Operation

In the de-energized (center) position, port 1, port 2, and port 3 are open to each other, while port 4 is blocked. When solenoid 1 is energized, flow is directed from port 3 to port 4 and from port 2 to port 1. When solenoid 2 is energized, flow is directed from port 3 to port 2 and from port 4 to port 1.

Ratings and specifications

*Performance data is typical with fluid at 21.8 cSt (105 SUS) and 49°C (120°F)*

- Typical application pressure (all ports): 210 bar (3000 psi)
- Cartridge fatigue pressure (infinite life): 210 bar (3000 psi)
- Rated flow: 11 l/min (3 USgpm)
- Internal leakage: 246 cm³/min (15 in³/min.) maximum @ 210 bar (3000 psi)
- Temperature range: -40 to 120°C (-40°F to 248°F)
- Coil duty: Continuous from 85% to 110% nominal voltage
- Cavity: C-10-4 (See page 75)
- Fluids: All general purpose hydraulic fluids such as: MIL-H-5606, SAE 10, SAE 20, etc.
- Filtration: Cleanliness code 18/16/13
- Standard housing material: Aluminum
- Weight including coil: 0.77 kg (1.70 lb.)
- Seal kit: 889625 Buna-N, 566080 Viton®

Viton is a registered trademark of E.I. DuPont Co.
Model Code  SV9-10-G

Function  SV9 - Solenoid valve

Size  10 - 10 size

Seals
Blank - Buna-N
V - Viton

Spool center condition
G - Ports 1, 2, and 3 open. Port 4 blocked.

Port size
0 - Cartridge only

<table>
<thead>
<tr>
<th>Code</th>
<th>Port size</th>
<th>Housing number</th>
</tr>
</thead>
<tbody>
<tr>
<td>3B</td>
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<td>566161</td>
</tr>
<tr>
<td>2G</td>
<td>1/4&quot; BSPP</td>
<td>876709</td>
</tr>
<tr>
<td>3G</td>
<td>3/8&quot; BSPP</td>
<td>876715</td>
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<tr>
<td>6H</td>
<td>SAE 6</td>
<td>876708</td>
</tr>
<tr>
<td>8H</td>
<td>SAE 8</td>
<td>876713</td>
</tr>
</tbody>
</table>

See pages 78 & 79 for housings

Connector types
Blank - No coil

<table>
<thead>
<tr>
<th>Voltage</th>
<th>G - ISO 4400 DIN 43650</th>
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</thead>
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<td>02-178063</td>
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<tr>
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<tr>
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<td>-</td>
<td>-</td>
</tr>
<tr>
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<td>02-178109</td>
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</tr>
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<tr>
<td>24B</td>
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<td>-</td>
<td>02-178835</td>
<td>02-178833</td>
<td>02-178843</td>
<td>02-178846</td>
</tr>
</tbody>
</table>

Dimensions

| Torque cartridge in housing 47-54 Nm (35-40 lbf ft) |
| Valve is shown with “W” coil. See other coils on page 81. |

Note
When solenoid valve is ordered as cartridge only, nut is included.

WARNING
Maintain 5-8 Nm (4-6 lbf ft) maximum torque on valve tube nut. Over tightening may cause valve failure.
C-**-2 (U) Cavity Dimensions

Dimensions
millimeter (inch)

Cavity bores can be machined accurately in aluminum. The necessary UNF, or UN threads may be machined using standard small tools, possibly already in your machine shop or from a local tool supplier. For in depth advice on the machining of cavities, consult your Vickers sales specialist.

Either you, our customer, or Vickers can design and manufacture customized manifolds or housings dedicated to individual applications. We call the resulting valve packages Modular Circuit Designs (MCDs). Cartridges selected for your application can be accommodated in one or more MCDs, according to your requirements.

<table>
<thead>
<tr>
<th>Cavity mm (inch)</th>
<th>A Spotface</th>
<th>B +0.051/0 (±0.002)</th>
<th>C +0.051/0 (±0.002)</th>
<th>D Thread</th>
<th>E Full Thread</th>
<th>F</th>
<th>G ±0.0254 (±0.001)</th>
<th>J</th>
<th>P R Max. Dia.</th>
<th>X Max. Dia.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C–8–2</td>
<td>30.16 (1.188)</td>
<td>20.65 (0.813)</td>
<td>17.47 (0.688)</td>
<td>.750°–16</td>
<td>12.70 (0.500)</td>
<td>2.54/2.92 (0.100/0.115)</td>
<td>19.05 (0.750)</td>
<td>12.72 (0.501)</td>
<td>30.17 (1.188)</td>
<td>14.68 (0.578)</td>
</tr>
<tr>
<td>C–10–2</td>
<td>30.16 (1.188)</td>
<td>24.00 (0.945)</td>
<td>20.62 (0.812)</td>
<td>.875°–14</td>
<td>15.88 (0.625)</td>
<td>2.54/2.92 (0.100/0.115)</td>
<td>23.81 (0.937)</td>
<td>15.90 (0.626)</td>
<td>33.32 (1.312)</td>
<td>27.94 (1.100)</td>
</tr>
<tr>
<td>C–12–2 (U)</td>
<td>38.10 (1.500)</td>
<td>29.15 (1.148)</td>
<td>24.76 (0.975)</td>
<td>1.062°–12</td>
<td>22.22 (0.875)</td>
<td>3.30/3.68 (0.130/0.145)</td>
<td>34.92 (1.375)</td>
<td>23.82 (0.938)</td>
<td>46.35 (1.825)</td>
<td>27.94 (1.100)</td>
</tr>
<tr>
<td>C–16–2</td>
<td>44.45 (1.750)</td>
<td>35.58 (1.401)</td>
<td>31.34 (1.234)</td>
<td>1.312°–12</td>
<td>22.22 (0.875)</td>
<td>3.30/3.68 (0.130/0.145)</td>
<td>34.14 (1.344)</td>
<td>28.62 (1.127)</td>
<td>46.84 (1.844)</td>
<td>24.60 (0.968)</td>
</tr>
<tr>
<td>C–20–2</td>
<td>57.66 (2.270)</td>
<td>43.59 (1.716)</td>
<td>39.12 (1.540)</td>
<td>1.625°–12</td>
<td>20.64 (0.812)</td>
<td>3.35/3.73 (0.132/0.147)</td>
<td>44.45 (1.750)</td>
<td>36.55 (1.439)</td>
<td>58.72 (2.312)</td>
<td>30.96 (1.218)</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Cavity mm (inch)</th>
<th>W</th>
<th>Y Max. dia.</th>
<th>Z</th>
</tr>
</thead>
<tbody>
<tr>
<td>C–12–2U (only)</td>
<td>30.83 (1.214)</td>
<td>12.70 (0.500)</td>
<td>34.29 (1.350)</td>
</tr>
</tbody>
</table>
C-**-3 & C-**-4 Cavity Dimensions

**Dimensions**

millimeter (inch)

### 3-way cavity

- **A** Spotface
- **B** +0.051 (0.002) (+0.002)
- **C** +0.051 (0.002)
- **D** Thread
- **E** Full Thread
- **F**
- **G** ± 0.0254 (± 0.001)
- **H** ± 0.0254 (± 0.001)
- **J**
- **K**
- **L**

<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>C-8-3</td>
<td>–</td>
<td>–</td>
<td>14.68 (0.578)</td>
<td>5.94 (0.234)</td>
<td>28.98 (1.141)</td>
<td>5.94 (0.234)</td>
<td>–</td>
<td>–</td>
<td>12.70 (0.501)</td>
</tr>
<tr>
<td>C-10-3</td>
<td>–</td>
<td>–</td>
<td>18.26 (0.719)</td>
<td>6.35 (0.250)</td>
<td>34.13 (1.344)</td>
<td>6.35 (0.250)</td>
<td>–</td>
<td>–</td>
<td>14.29 (0.562)</td>
</tr>
<tr>
<td>C-8-4</td>
<td>12.72 (0.501)</td>
<td>56.13 (2.210)</td>
<td>14.68 (0.578)</td>
<td>5.94 (0.234)</td>
<td>28.98 (1.141)</td>
<td>5.94 (0.234)</td>
<td>43.25 (1.703)</td>
<td>5.94 (0.234)</td>
<td>11.13 (0.438)</td>
</tr>
<tr>
<td>C-10-4</td>
<td>15.90 (0.626)</td>
<td>63.50 (2.500)</td>
<td>18.26 (0.718)</td>
<td>6.35 (0.250)</td>
<td>34.13 (1.344)</td>
<td>6.35 (0.250)</td>
<td>50.00 (1.968)</td>
<td>6.35 (0.250)</td>
<td>14.29 (0.562)</td>
</tr>
</tbody>
</table>

**Notes:**
- These diameters unless otherwise specified.
- These diameters unless otherwise specified.

---

Cavity Dimensions

1. **A** Spotface
2. **B** +0.051 (0.002) (+0.002)
3. **C** +0.051 (0.002)
4. **D** Thread
5. **E** Full Thread
6. **F**
7. **G** ± 0.0254 (± 0.001)
8. **H** ± 0.0254 (± 0.001)
9. **J**
10. **K**
11. **L**

### 4-way cavity

- **A** Spotface
- **B** +0.051 (0.002) (+0.002)
- **C** +0.051 (0.002)
- **D** Thread
- **E** Full Thread
- **F**
- **G** ± 0.0254 (± 0.001)
- **H** ± 0.0254 (± 0.001)
- **J**
- **K**
- **L**

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>C-8-3</td>
<td>–</td>
<td>–</td>
<td>14.68 (0.578)</td>
<td>5.94 (0.234)</td>
<td>28.98 (1.141)</td>
<td>5.94 (0.234)</td>
<td>–</td>
<td>–</td>
<td>12.70 (0.501)</td>
</tr>
<tr>
<td>C-10-3</td>
<td>–</td>
<td>–</td>
<td>18.26 (0.719)</td>
<td>6.35 (0.250)</td>
<td>34.13 (1.344)</td>
<td>6.35 (0.250)</td>
<td>–</td>
<td>–</td>
<td>14.29 (0.562)</td>
</tr>
<tr>
<td>C-8-4</td>
<td>12.72 (0.501)</td>
<td>56.13 (2.210)</td>
<td>14.68 (0.578)</td>
<td>5.94 (0.234)</td>
<td>28.98 (1.141)</td>
<td>5.94 (0.234)</td>
<td>43.25 (1.703)</td>
<td>5.94 (0.234)</td>
<td>11.13 (0.438)</td>
</tr>
<tr>
<td>C-10-4</td>
<td>15.90 (0.626)</td>
<td>63.50 (2.500)</td>
<td>18.26 (0.718)</td>
<td>6.35 (0.250)</td>
<td>34.13 (1.344)</td>
<td>6.35 (0.250)</td>
<td>50.00 (1.968)</td>
<td>6.35 (0.250)</td>
<td>14.29 (0.562)</td>
</tr>
</tbody>
</table>
C-**-2 Aluminum Housings (Light Duty)

<table>
<thead>
<tr>
<th>Housing</th>
<th>Ports 1 &amp; 2</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>C-10-2</td>
<td>3/8” BSPP</td>
<td>02-175462</td>
</tr>
<tr>
<td></td>
<td>SAE 6</td>
<td>566151</td>
</tr>
<tr>
<td>C-16-2</td>
<td>3/4” BSPP</td>
<td>02-175463</td>
</tr>
<tr>
<td></td>
<td>SAE 12</td>
<td>566149</td>
</tr>
<tr>
<td>C-20-2</td>
<td>1” BSPP</td>
<td>02-175464</td>
</tr>
<tr>
<td></td>
<td>SAE 16</td>
<td>566409</td>
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</tbody>
</table>

Note: BSPP porting is designated by “B” in the model code
SAE porting is designated by ‘T’ in the model code

<table>
<thead>
<tr>
<th>Cavity mm (inch)</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>I</th>
<th>Mass kg (lb.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>C-10-2</td>
<td>50.8 (2.00)</td>
<td>19.0 (0.75)</td>
<td>50.8 (2.00)</td>
<td>31.7 (1.25)</td>
<td>15.9 (0.62)</td>
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C-**-2 Aluminum Housings (Fatigue Rated)

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<td>3/4&quot; BSPP</td>
<td>02–161115</td>
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<td>SAE 10</td>
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<td>SAE 12</td>
<td>02–160645</td>
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<td>3/4&quot; BSPP</td>
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<td>1&quot; BSPP</td>
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Note: BSPP porting is designated by "G" in the model code. SAE porting is designated by either "T" or "H" in the model code.

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<th>Cavity mm (inch)</th>
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<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>I</th>
<th>Mass kg (lb.)</th>
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<td>51.0 (2.00)</td>
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<td>19.0 (0.75)</td>
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<td>9.5 (0.37)</td>
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<td>C-12-2(U)</td>
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<td>101.6 (4.00)</td>
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C-**-3 & 4 Aluminum Housings (Light Duty)

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<tr>
<th>Housing</th>
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<td>C-10-4</td>
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Note: BSPP is designated by "B" in model code
SAE is designated by "T" in model code

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<th>Cavity mm (inch)</th>
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<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>J</th>
<th>K</th>
<th>L</th>
<th>Mass kg (lb.)</th>
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<td>C-10-3</td>
<td>63.5 (2.50)</td>
<td>31.7 (1.25)</td>
<td>66.6 (3.25)</td>
<td>7.1 (0.28)</td>
<td>12.7 (0.50)</td>
<td>3.1 (0.12)</td>
<td>19.0 (0.75)</td>
<td>34.9 (1.37)</td>
<td>31.7 (1.25)</td>
<td>15.8 (0.62)</td>
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<td>0.3 (0.72)</td>
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<td>C-10-4</td>
<td>63.5 (2.50)</td>
<td>31.7 (1.25)</td>
<td>82.5 (3.25)</td>
<td>7.1 (0.28)</td>
<td>9.5 (0.37)</td>
<td>3.1 (0.12)</td>
<td>34.9 (1.37)</td>
<td>19.0 (0.75)</td>
<td>31.7 (1.25)</td>
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## C-**-3 & 4 Aluminum Housings (Fatigue Rated)

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<th>Housing</th>
<th>All Ports</th>
<th>Part Number</th>
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Note: BSPP porting is designated by either “B” or “G” in the model code. SAE porting is designated by either “H” or “T” in the model code.

### C-8-3

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<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>J</th>
<th>K</th>
<th>L</th>
<th>Mass kg (lb.)</th>
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<td>29.8 (1.17)</td>
<td>38.1 (1.50)</td>
<td>19.0 (0.75)</td>
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Note: BSPP porting is designated by either “B” or “G” in the model code. SAE porting is designated by either “H” or “T” in the model code.
8-Series Coils

Coil Dimensions
millimeter (inch)

“G” - DIN connector

“N” - Deutsch Type connector

“P” - 1/2” NPT conduit

“Q” - Spade terminal

“W” - 610 mm (24 inch) lead wire

“Y” - AMP JR. connector

DIN 43650 connector for “G” style coil – 02–166796

View A
Note: width - all configurations

Voltage

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<th>Voltage</th>
<th>w/o diode</th>
<th>COIL PART NUMBERS</th>
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<td>12 VDC</td>
<td>w/o diode</td>
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<td>24 VDC</td>
<td>w/o diode</td>
<td></td>
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<tr>
<td>36 VDC</td>
<td>w/o diode</td>
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<td>24 VAC</td>
<td>w/o diode</td>
<td></td>
</tr>
<tr>
<td>115 VAC</td>
<td>w/o diode</td>
<td></td>
</tr>
<tr>
<td>220 VAC</td>
<td>w/o diode</td>
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<tr>
<td>12 VDC*</td>
<td>w/o diode</td>
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<td>24 VDC*</td>
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Part Numbers

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<th>Voltage</th>
<th>G Connector</th>
<th>N Connector</th>
<th>P Connector</th>
<th>Q Connector</th>
<th>W Connector</th>
<th>Y Connector</th>
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<td>02–160684</td>
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<td>02–160959</td>
<td>02–160685</td>
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Specifications

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<th>Amperes*</th>
<th>Lead Color</th>
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<td>240 AC</td>
<td>0.07</td>
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</table>

*Duty Rating
Continuous from 85% to 110% of nominal voltage

Operating Temperature –100°C (212°F) continuous @ nominal voltage

Lead Wires – 18 gauge, 610 mm (24” long), UL style 3173 CSA CL 1251 (meets SAE J1128 XLPE style SXL)

Wattage – All coils are nominally 16 watts @ 25°C (77°F)

Encapsulant – P.E.T.

Magnet Wire – U.L. class N, 200°C (392°F) NEMA pub. no. MW 1000, section MW 35–C (single)

Flyback diode (arc suppressor) – Maximum recurrent peak reverse voltage – 800 V (optional)

For other voltages and connectors contact a Vickers representative.
**10, 12, 16, 20-Series Coils**

### Coil Dimensions

<table>
<thead>
<tr>
<th>millimeter (inch)</th>
<th>“G”- DIN connector</th>
<th>“N”- Deutsch Type connector</th>
<th>“P”- 1/2” NPT conduit</th>
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</thead>
<tbody>
<tr>
<td>19.3 (0.76)</td>
<td>46.0 (1.81)</td>
<td>46.0 (1.81)</td>
<td>46.0 (1.81)</td>
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<td>50.5 (1.99)</td>
<td>48.7 (1.92)</td>
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<td>55.8 (2.20)</td>
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<td>50.5 (1.99)</td>
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<td>44.2 (1.74)</td>
<td>17.1 (0.67)</td>
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<td>28.2 (1.11)</td>
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</table>

<table>
<thead>
<tr>
<th>“Q” - Spade terminal</th>
<th>“W” 610 mm (24 inch) lead wire</th>
<th>“Y” - AMP JR. connector</th>
<th>View A</th>
</tr>
</thead>
<tbody>
<tr>
<td>19.3 (0.76)</td>
<td>39.3 (1.55)</td>
<td>35.3 (1.22)</td>
<td>38.9 (1.53)</td>
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<tr>
<td>50.5 (1.99)</td>
<td>50.5 (1.99)</td>
<td>32.6 (1.29)</td>
<td>42.8 (1.68)</td>
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<tr>
<td>28.2 (1.11)</td>
<td>28.2 (1.11)</td>
<td>28.2 (1.11)</td>
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</tbody>
</table>

### Specifications

#### Voltage w/o diode

<table>
<thead>
<tr>
<th>Voltage</th>
<th>G Connector</th>
<th>N Connector</th>
<th>P Connector</th>
<th>Q Connector</th>
<th>W Connector</th>
<th>Y Connector</th>
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</thead>
<tbody>
<tr>
<td>12 VDC</td>
<td>02–170886</td>
<td>02–170893</td>
<td>02–17078</td>
<td>02–17070</td>
<td>02–17063</td>
<td>02–178711</td>
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<tr>
<td>24 VDC</td>
<td>02–170887</td>
<td>02–17094</td>
<td>02–17079</td>
<td>02–17073</td>
<td>02–17065</td>
<td>02–178712</td>
</tr>
<tr>
<td>36 VDC</td>
<td>02–170895</td>
<td>02–17080</td>
<td>02–17080</td>
<td>02–17075</td>
<td>02–17066</td>
<td>02–178713</td>
</tr>
<tr>
<td>24 VAC</td>
<td>02–178112</td>
<td>N/A</td>
<td>02–178104</td>
<td>02–178103</td>
<td>02–178102</td>
<td>N/A</td>
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<td>120 VAC</td>
<td>02–178114</td>
<td>02–178106</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
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<tr>
<td>240 VAC</td>
<td>02–178117</td>
<td>02–178109</td>
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<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
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<tr>
<td>12 VDC*</td>
<td>02–178840</td>
<td>02–178842</td>
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<td>N/A</td>
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<td>N/A</td>
<td>N/A</td>
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</table>

*optional arc suppression diode

#### Lead Wires

- 18 gauge, 610 mm (24" long), UL style 3173 CSA CL 1251 (meets SAE J1128 XLPE style SXL)

#### Magnet Wire

- U.L. class N, 200°C (392°F) NEMA pub. no. MW 1000, section MW 35–C (single)

#### Flyback diode (arc suppressor)

- Maximum recurrent peak reverse voltage – 800 V (optional)

### Encapsulant

- P.E.T.
The manual override option is intended for emergency use, not for continuous duty operation.

### Manual override “M” for two position, pull type solenoid valves

- **8-Series**
  - Pull up knob until the override tooth is completely out of the detent base.
  - Turn the knob clockwise until the override tooth is resting securely on top of the detent base slot.

### Manual override “R” for cable type solenoid valves

- **8-Series**
  - Pull up knob slightly from surface.
  - Turn the knob clockwise until the override tooth is securely engaged in slot of the detent base.

### Manual override “M & R” options are available on the following models:

<table>
<thead>
<tr>
<th>Model</th>
<th>Model</th>
<th>Model</th>
<th>Model</th>
<th>Model</th>
<th>Model</th>
<th>Model</th>
<th>Model</th>
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</thead>
<tbody>
<tr>
<td>SV1-10-M-0-00</td>
<td>SV3-10-CM-0-00</td>
<td>SV4-8-CM-0-00</td>
<td>SV1-10-CR-0-00</td>
<td>SV4-10-CR-0-00</td>
<td>SV3-12-CR-0-00</td>
<td>SV3-12-CR-0-00</td>
<td>SV5-8-OP-0-00</td>
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<tr>
<td>SV1-10-4M-0-00</td>
<td>SV4-10-4M-0-00</td>
<td>SV3-12-CM-0-00</td>
<td>SV2-10-4R-0-00</td>
<td>SV4-10-0R-0-00</td>
<td>SV1-16-CR-0-00</td>
<td>SV1-16-CR-0-00</td>
<td>SV4-10-0R-0-00</td>
</tr>
<tr>
<td>SV1-10-CM-0-00</td>
<td>SV4-10-CM-0-00</td>
<td>SV1-16-CM-0-00</td>
<td>SV2-10-CR-0-00</td>
<td>SV5-10-4R-0-00</td>
<td>SV2-20-CR-0-00</td>
<td>SV2-20-CR-0-00</td>
<td>SV5-10-4R-0-00</td>
</tr>
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<td>SV2-10-4M-0-00</td>
<td>SV4-10-4M-0-00</td>
<td>SV2-20-CM-0-00</td>
<td>SV3-10-4R-0-00</td>
<td>SV4-8-OM-0-00</td>
<td>SV1-8-4M-0-00</td>
<td>SV1-8-4M-0-00</td>
<td>SV4-8-OM-0-00</td>
</tr>
<tr>
<td>SV2-10-CM-0-00</td>
<td>SV5-10-4M-0-00</td>
<td>SV1-10-3R-0-00</td>
<td>SV3-10-CR-0-00</td>
<td>SV1-8-3M-0-00</td>
<td>SV2-8-4M-0-00</td>
<td>SV2-8-4M-0-00</td>
<td>SV1-8-3M-0-00</td>
</tr>
<tr>
<td>SV3-10-4M-0-00</td>
<td>SV5-8-CM-0-00</td>
<td>SV1-10-4R-0-00</td>
<td>SV4-10-4R-0-00</td>
<td>SV4-8-3M-0-00</td>
<td>SV4-8-3M-0-00</td>
<td>SV4-8-3M-0-00</td>
<td>SV4-8-3M-0-00</td>
</tr>
</tbody>
</table>

- The manual override option is intended for emergency use, not for continuous duty operation.
Manual Override Options

Manual override “S” for two position, screw type solenoid valves

To override:
1. Turn the override button clockwise until it stops.
2. The override button will remain activated until the override button is turned counterclockwise.

To release:
1. Turn the override button counterclockwise until it stops.

Manual override “P” for two position, push type solenoid valves

To override:
1. Push the override button to stop and hold

To release:
1. Remove pressure from the override button.

Manual override “R” for cable type solenoid valves
(not available on size 8 models)

To override:
1. Pull up knob until the override tooth is completely out of the detent base.
2. Turn the knob clockwise until the override tooth is resting securely on top of the detent base slot

To release:
1. Pull up knob slightly from surface.
2. Turn the knob clockwise until the override tooth is securely engaged in slot of the detent base

The manual override option is intended for emergency use, not for continuous duty operation.

Manual override “M & R” options are available on the following models:

Manual override “M” for two position, pull type solenoid valves

Manual override “S” for two position, screw type solenoid valves

Manual override “P” for two position, push type solenoid valves

Manual override “R” for cable type solenoid valves
(not available on size 8 models)

Dimensions
millimeter (inch)

Manual override “S” for two position, screw type solenoid valves

Manual override “P” for two position, push type solenoid valves

Manual override “R” for cable type solenoid valves
(not available on size 8 models)
Supporting Products

Roughing Tools
Roughers are basically step drills which leave .030” per cutting diameter and .015” above all radii for the finishing reamer, with an additional .015” depth in the cavity bottom as clearance.

The roughing tool is necessary to prepare the cavity for the finishing reamer, which has not been designed for the primary forming or bottom cutting. We offer two types of roughers, one for aluminum and one for steel. The aluminum rougher is manufactured with a 4-facet point and polished flutes. The steel rougher is supplied with a standard drill point. Both types will work in either material; however, longevity of an aluminum tool will be sacrificed when used continually in steel.

<table>
<thead>
<tr>
<th>Cavity</th>
<th>Material</th>
<th>Model Code</th>
<th>Assembly Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>2–Way</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C–8–2</td>
<td>Aluminum / Steel</td>
<td>RT1–8–2–AS–8028</td>
<td>02–165580</td>
</tr>
<tr>
<td>C–10–2</td>
<td>Aluminum</td>
<td>RT–10–2–A–8030</td>
<td>889509</td>
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<tr>
<td>C–12–2</td>
<td>Aluminum / Steel</td>
<td>RT–12–2–AS–8213</td>
<td>02–160625</td>
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<tr>
<td>C–16–2</td>
<td>Aluminum</td>
<td>RT–16–2–A–8031</td>
<td>889515</td>
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<tr>
<td>C–20–2</td>
<td>Aluminum</td>
<td>RT–20–2–A–8032</td>
<td>565822</td>
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<tr>
<td>3–Way</td>
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</tr>
<tr>
<td>C–8–3</td>
<td>Aluminum / Steel</td>
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<td>02–162384</td>
</tr>
<tr>
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<td>Aluminum</td>
<td>RT–10–3–A–8038</td>
<td>889511</td>
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<tr>
<td>4–Way</td>
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<tr>
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<td>RT–8–4–AS–8292</td>
<td>02–172803</td>
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<td>Aluminum</td>
<td>RT–10–4–A–8072</td>
<td>889513</td>
</tr>
</tbody>
</table>

Finishing Tools
These finishing tools have been designed as precision reamers for finishing operations only. They are not intended for primary forming or bottom cutting operations. Vickers recommends that a finishing tool only be used in a properly roughed hole. Failure to conform to this practice will produce unsatisfactory size and finishes and possibly break the tool.

<table>
<thead>
<tr>
<th>Cavity</th>
<th>Material</th>
<th>Model Code</th>
<th>Assembly Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>2–Way</td>
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<td></td>
</tr>
<tr>
<td>C–8–2</td>
<td>Aluminum / Steel</td>
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<td>FT–10–2–AS–8048</td>
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<td>FT–12–2–AS–8214</td>
<td>02–162162</td>
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<td>Aluminum / Steel</td>
<td>FT–20–4–AS–8085</td>
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</table>
Supporting Products

Finishing Form Tools Speed & Feed for Aluminum 6061–T6 (T651)

This information is recommended as a good starting point. Speeds and/or feeds may be increased or decreased depending on actual machining conditions.

NOTE: Finish form tools may require 1/2 to 1–1/2 second dwell to obtain necessary finish.

<table>
<thead>
<tr>
<th>CNC MACHINE TOOL</th>
<th>RPM</th>
<th>IPM</th>
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<tr>
<td>C–10–4</td>
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<tr>
<td>C–16–2</td>
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<tr>
<td>C–16–3</td>
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<td>C–16–4</td>
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<td>C–20–2</td>
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<table>
<thead>
<tr>
<th>BRIDGEPORT / LAGUN TYPE MACHINES</th>
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<tr>
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<tr>
<td>C–10–3</td>
</tr>
<tr>
<td>C–10–4</td>
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<tr>
<td>C–16–4</td>
</tr>
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<td>C–20–2</td>
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</table>

Fluid Cleanliness

The recommended cleanliness code for the valves in this publication is 18/16/13.

Proper fluid condition is essential for long and satisfactory life of hydraulic components and systems. Hydraulic fluid must have the correct balance of cleanliness, materials, and additives for protection against wear of components, elevated viscosity, and inclusion of air.

Essential information on the correct methods for treating hydraulic fluid is included in Vickers publication 561 "Vickers Guide to Systemic Contamination Control" available from your local Vickers distributor or by contacting Vickers, Incorporated. Recommendations on filtration and the selection of products to control fluid condition are included in 561.

Solenoid valve miscellaneous parts

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<th>Normally closed nut</th>
<th>02–170821</th>
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<tbody>
<tr>
<td>8 Series</td>
<td>565558</td>
</tr>
<tr>
<td>10, 12, 16, 20 Series</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Normally open nut</th>
<th>02–179226</th>
</tr>
</thead>
<tbody>
<tr>
<td>8, 10, 12, 16, 20 Series</td>
<td>565559</td>
</tr>
</tbody>
</table>

Note: When a solenoid valve is ordered as a cartridge only, the nut is included.
<table>
<thead>
<tr>
<th>MODEL</th>
<th>DESCRIPTION</th>
<th>TYPICAL APPLICATION PRESSURE bar (psi)</th>
<th>RATED FLOW l/min (USgpm)</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>SV1–8–3/3M</td>
<td>spool type</td>
<td>3-way, 2-position</td>
<td>210 (3000)</td>
<td>11 (3)</td>
</tr>
<tr>
<td>SV1–8–4/4M</td>
<td>spool type</td>
<td>4-way, 2-position</td>
<td>210 (3000)</td>
<td>11 (3)</td>
</tr>
<tr>
<td>SV2–8–4/4M</td>
<td>spool type</td>
<td>4-way, 2-position</td>
<td>210 (3000)</td>
<td>13 (4)</td>
</tr>
<tr>
<td>SV4–8–3/3M</td>
<td>spool type</td>
<td>3-way, 2-position</td>
<td>210 (3000)</td>
<td>13 (4)</td>
</tr>
<tr>
<td>SV4–8–C/CM</td>
<td>spool type</td>
<td>2-way, 2-position, Normally Closed</td>
<td>210 (3000)</td>
<td>11 (3)</td>
</tr>
<tr>
<td>SV4–8–O/CM</td>
<td>spool type</td>
<td>2-way, 2-position, Normally Open</td>
<td>210 (3000)</td>
<td>13 (4)</td>
</tr>
<tr>
<td>SV5–8–C/CM</td>
<td>poppet type</td>
<td>2-way, 2-position, Normally Closed</td>
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<td>23 (6)</td>
</tr>
<tr>
<td>SV5–8–O/OP/OS</td>
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<td>SV1–10–C/CM/CR</td>
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<tr>
<td>SV2–10–C/CM/CR</td>
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</tr>
<tr>
<td>SV3–10–4/4M/4R</td>
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<td>23 (6)</td>
</tr>
<tr>
<td>SV3–10–C/CM/CR</td>
<td>poppet type</td>
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</tr>
<tr>
<td>SV3–10–O/OP/OS</td>
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<tr>
<td>SV4–10–3/3P/3S</td>
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</tr>
<tr>
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<td>23 (6)</td>
</tr>
<tr>
<td>SV4–10–C/CM/CR</td>
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<td>23 (6)</td>
</tr>
<tr>
<td>SV4–10–O/OM/OR</td>
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<td>210 (3000)</td>
<td>23 (6)</td>
</tr>
<tr>
<td>SV5–10–4/4M/4R</td>
<td>spool type</td>
<td>4-way, 2-position</td>
<td>210 (3000)</td>
<td>23 (6)</td>
</tr>
<tr>
<td>SV5–10–O/OP/OS</td>
<td>poppet type</td>
<td>2-way, 2-position, Normally Open</td>
<td>210 (3000)</td>
<td>45 (12)</td>
</tr>
<tr>
<td>SV7–10–3/3P/3S</td>
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<td>3-way, 2-position</td>
<td>210 (3000)</td>
<td>17 (5)</td>
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<td>SV9–10–A</td>
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<tr>
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<td>C-**-3/4</td>
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