ROSS CONTROLS®

DOUBLE VALVES FOR CLUTCH/BRAKE CONTROL

DM²® SERIES D AND 35 SERIES
Contents

DM² Series Double Valves for Control Reliable Energy Isolation

- With Dynamic Monitoring & Memory DM² Series D

SERPAR® Double Valves 35 Series

- with L-G Monitor
- with E-P Monitor
- with D-S Monitor

SERPAR® Crossflow Double Valves 35 Series

- with Pressure Switches
- without Pressure Switches

Explosion Proof Valves for Clutch/Brake Control

Consult ROSS

Automatic Systems

Consult ROSS

Modular Air Distribution

Consult ROSS

Automation Valves

Consult ROSS

Cautions and Warranty

- Compatible Lubricants
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<td>4</td>
<td>3 3 3</td>
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<td>8 8.5 9</td>
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<td>D-S Monitor</td>
<td>8</td>
<td>3.5 4 4</td>
<td></td>
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<td>12</td>
<td>8 8.5 9</td>
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<td>35 SERPAR® Crossflow</td>
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<td>With or Without Pressure Switches</td>
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<td>0.9 1.2</td>
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<td></td>
<td>2</td>
<td>3.7 4.2</td>
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<td>3.5 4 4</td>
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<td>8 8.5 9</td>
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<tr>
<td></td>
<td>30</td>
<td>20 21 21</td>
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</tr>
</tbody>
</table>
Double Valves Control Reliable for Clutch/Brake Control

DM²® Series D
**DM²® Monitoring:**

The DM²® is a patented 3/2 normally closed valve (with an intermediate, lockout position) distinguished by SERPAR® Crossflow passages with poppet and spool valving on the main valve stems. This arrangement provides the valve’s outstanding flow characteristics and an integrated monitoring capability with total memory. The valve provides dynamic monitoring and dynamic memory.

*Dynamic Monitoring* means that all monitoring components change state on every valve cycle. Should the valve elements cycle asynchronously, the valve will exhaust downstream air and lock-out, prohibiting further operation.

*Dynamic Memory* within a monitoring system indicates that when a valve lock-out occurs, the valve will retain the fault information regardless of air or electrical changes. The DM²® system can only be reset by a defined operation/procedure, and will not self-reset (turning the valve off and on) or reset when inlet air supply is removed and re-applied. Such automatic resetting would conceal potential hazards from the operator.

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**Explosion-Proof solenoid pilot valves available, consult ROSS.**

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<table>
<thead>
<tr>
<th>VALVE SERIES</th>
<th>AVAILABLE PORT SIZES</th>
<th>MAX. FLOW Cv</th>
<th>Reset</th>
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</thead>
<tbody>
<tr>
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<td>1/4 3/8 1/2 3/4 1 1½</td>
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<tr>
<td>DM²® D</td>
<td>2.17 2.17 2.8 4.63 4.63</td>
<td>8.86 20.22</td>
<td>G1.3 - G1.6</td>
</tr>
</tbody>
</table>

DM²® D Series E & C Preassembled Wiring Kits

Accessories

www.rosscontrols.com
Self Monitored - Clutch/Brake Control

**Basic Size 2, 4, 8, 12 and 30**

**Dynamic Monitoring With Complete Memory:** Memory, monitoring, and air flow control functions are simply integrated into two identical valve elements. Valves lock-out due to asynchronous movement of valve elements during actuation or de-actuation, resulting in a residual outlet pressure of less than 1% of supply. Overt action is required for reset – cannot be reset by removing and re-applying supply pressure. Reset can only be accomplished by remote air signal, optional electrical solenoid reset signal, or optional manual reset.

**Basic 3/2 Normally Closed Valve Function:** Dirt tolerant, wear compensating poppet design for quick response and high flow capacity. PTFE back-up rings on pistons to enhance valve endurance – operates with or without inline lubrication.

**Status Indicator (Optional):** Includes a pressure switch with both normally open and normally closed contacts to provide status feedback to the press control system indicating whether the valve is in the lockout or ready-to-run condition. The Status Indicator can be ordered installed or purchased separately and added to any DM2® base.

**Silencers:** All models include high flow, clog resistant silencers.

**Mounting:** Base mounted – with BSPP or NPT pipe threads. Inlet and outlet ports on both sides provide for flexible piping (plugs for unused ports included). Captive valve-to-base mounting screws.

**Basic Size 12 and 30**

**Intermediate Pilots:** Increases pilot air flow for fast valve response, making it possible to use the same size solenoids as valve sizes 2, 4 & 8, thereby reducing electrical power requirements for these larger valves.

**How to Order**

(Choose your options (in red) to configure your valve model number.)

<table>
<thead>
<tr>
<th>THREAD</th>
<th>BSPP</th>
<th>D</th>
<th>NPT</th>
<th>A</th>
<th>4</th>
<th>2</th>
<th>A</th>
<th>1</th>
<th>1</th>
<th>STATUS INDICATOR</th>
<th>Remote</th>
<th>Solenoid</th>
<th>No</th>
<th>Yes</th>
<th>DM2D</th>
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</thead>
<tbody>
<tr>
<td>Size 2</td>
<td>2/8</td>
<td>2</td>
<td>4/12</td>
<td>3/30</td>
<td>8</td>
<td>2</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>Base mounted.</td>
<td>1</td>
<td>1</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Size 4</td>
<td>1/4 inlet – 1/4 outlet</td>
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<tr>
<td>Size 8</td>
<td>3/8 inlet – 3/8 outlet</td>
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<td>X</td>
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<tr>
<td>Size 12</td>
<td>1/2 inlet – 1/2 outlet</td>
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<td>X</td>
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<tr>
<td>Size 30</td>
<td>3/4 inlet – 3/4 outlet</td>
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</tbody>
</table>

**Standard Specifications** (for valves on this page):

**Construction:** Dual poppet.

**Mounting Type:** Base mounted.

**Pilot Solenoids:** According to VDE 0580. Enclosure rating according to DIN 40050, IEC 60529 IP65. Two solenoids, rated for continuous duty (additional solenoid on optional reset).

**Standard Voltages/Pilot Solenoids Power Consumption** (each solenoid):

**Basic Size 2, 4, 12, 30:** Primary and reset solenoids:
- 24 volts DC; 110 volts AC, 50 Hz; 120 volts AC, 50/60 Hz.
- 5.8 watts nominal on AC and DC.
- 6.5 watts maximum on AC and DC.

**Basic Size 8:** 24 volts DC; 110 volts AC, 50/60 Hz.
- Primary solenoids: 15 watts on DC; 36 VA inrush and 24.6 VA holding on AC.
- Reset solenoid: 6.0 watts on DC; 15.8 VA inrush and 10.4 VA holding on AC.

**Electrical connection:** DIN 43650, Form A.

**Ambient Temperature:** 15° to 120°F (-10° to 50°C).

**Media Temperature:** 40° to 175°F (4° to 80°C).

**Flow Media:** Filtered, lubricated or unlubricated (mineral oils according to DIN 51519, viscosity classes 32-46).

**Inlet Pressure:**
- **Basic Size 2:** 45 to 150 psig (3.1 to 10.3 bar).
- **Basic Size 4, 8, 12, 30:** 32 to 120 psig (2.1 to 8.3 bar).

**Reset Pressure:** For remote air reset option – must be equal to inlet pressure.

**Manual Pressure:** Encapsulated, push button actuation.

**Pressure Switch (Status Indicator) Rating:** Contacts - 5 amps at 250 volts AC, or 5 amps at 30 volts DC.

**Monitoring:** Dynamically, cyclically, internally during each actuating and de-actuating movement. Monitoring function has memory and requires an overt act to reset unit after lockout.

**Mounting orientation:** Preferably horizontally (valve on top of base) or vertically (valve on top of base).

**Functional Safety Data:** Category 4 PL e; B10d: 20,000,000; PFHd: 771x10^8; MTTFd: 301.9 (n: 662400).

**Certificates:** CE Marked for applicable directives, BG, CSA/UL, TSSA for appropriately tested valves.

**Vibration/Impact Resistance:** Tested to BS EN 60068-2-27.
Control Reliable Double Valves
DM® Series D

Valve Technical Data

<table>
<thead>
<tr>
<th>SUB-BASE MODEL NUMBERS and SUB-BASE SPECIFIC INFORMATION</th>
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<tbody>
<tr>
<td><strong>Valve Basic Size</strong></td>
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<tr>
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<td>30</td>
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<td>30</td>
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</tbody>
</table>

* NPT port threads. For BSPP threads add a “D” prefix to the model number, e.g., D1872C91.
**Valve de-actuated (ready-to-run):**

The flow of inlet air pressure into the crossover passages is restricted by the size of the passage between the stem and the valve body opening. Flow is sufficient to quickly pressurize pilot supply/timing chambers A and B. The inlet poppets prevent air flow from crossover passages into the outlet chamber. Air pressure acting on the inlet poppets and return pistons securely hold the valve elements in the closed position. (Air passages shown out of position and reset adapter omitted for clarity.)

**Valve locked-out:**

Whenever the valve elements operate in a sufficiently asynchronous manner, either on actuation or de-actuation, the valve will move to a locked-out position. In the locked-out position, one crossover and its related timing chamber will be exhausted, and the other crossover and its related timing chamber will be fully pressurized. The valve element (side B) that is partially actuated has pilot air available to fully actuate it, but no air pressure on the return piston to fully de-actuate the valve element. Air pressure in the crossover acts on the differential of side B stem diameters creating a latching force. Side A is in a fully closed position, and has no pilot air available to actuate, but has full pressure on the inlet poppet and return piston to hold the element in the fully closed position. Inlet air flow on side A into its crossover is restricted, and flows through the open inlet poppet on side B, through the outlet into the exhaust port, and from the exhaust port to atmosphere. Residual pressure in the outlet is less than 1% of inlet pressure.

The return springs are limited in travel, and can only return the valve elements to the intermediate (locked-out) position. Sufficient air pressure acting on the return pistons is needed to return the valve elements to a fully closed position.

**Resetting the valve:**

The valve will remain in the locked-out position, even if the inlet air supply is removed and re-applied. A remote reset signal (air or electric), or a manual push button actuation must be applied to reset the valve. Reset is accomplished by momentarily pressurizing the reset port. Actuation of the reset piston physically pushes the main valve elements to their closed position. Inlet air fully pressurizes the crossovers and holds the inlet poppets on seat. Actuation of the reset piston opens the reset poppet, thereby, immediately exhausting pilot supply air, thus, preventing valve operation during reset. (Reset adapter added to illustration.)

De-actuation of reset pistons causes the reset poppets to close and pilot supply to fully pressurize.

Reset air pressure can be applied by a remote 3/2 normally closed valve, or from an optional 3/2 normally closed solenoid, or a manual push button mounted on the reset adapter.

**Status Indicator:**

The status indicator pressure switch will actuate when the main valve is operating normally, and will de-actuate when the main valve is in the locked-out position or inlet pressure is removed. This device is not part of the valve lockout function, but, rather, only reports the status of the main valve.

**Schematic - Valve de-actuated**

Basic Size 12 and 30 valves require relatively large pilots to actuate and de-actuate the main valve elements. In order to achieve extremely quick valve response for such large pilots, a 2-stage solenoid pilot system is incorporated into the design. This keeps the required electrical current to operate the pilots to a minimum.

**Status indicator (optional) in normal ready-to-run position.**

Basic Size 12 & 30 pilots
The charts below represent the fill and exhaust times for each of the various sizes of DM® Series D double valves. The “fill” times were measured while raising (filling) the pressure in a volume from 0 to 30, 60, & 80 psi (0 to 2.1, 4.1, & 5.5 bar) with a 90 psi (6.2 bar) inlet pressure. Conversely, the “exhaust” times were measured while lowering the pressure (exhausting) in a volume from 90 psi (6.2 bar) down to 90 to 60, 30, & 9 psi (4.1, 2.1, & 0.6 bar). Exhausting tests performed with silencer installed.
Wiring Kits with J-Box

A J-Box is a junction box with a 10-pin MINI connector for connecting to the user’s control system and (4) 5-pin M12 ports for connecting to the 3 solenoids and the status indicator on the DM²® Series valve. The J-Box kits include the J-Box as described above and (4) 1-meter cables for connecting to the valve. These cables have a connector on each end. The status indicator cable and the (3) solenoid cables have an M12 connector on one end and a DIN connector on the other end (M12-DIN).

Standard valves come with DIN type solenoid connections, but could be bought with M12 type connections as well. Therefore we also offer a kit that provides solenoid cables with an M12 connector on each end (M12-M12).

10 PIN MINI Cable

These cables have a 10-pin MINI connector for connecting the J-Box kits above to the user’s control system. Kits include one cable with connector and cord grip. Cable conductors are 18-gauge wire.

Outlet Port Pressure Monitoring Wiring Kit

Some customers prefer to monitor downstream pressure in addition to using the DM²® or DM¹ Series valve. A convenient way to do this is to install a pressure switch in the extra outlet port that is provided on the valve. The Outlet Port Pressure Monitoring kit can be used with one of the J-Box kits above to split one of the M12 ports on the J-Box so that a pressure switch can be wired in as well. These kits consist of one port splitter (a Tee with three M12 connectors) and one M12-DIN cable (1 meter).

Pressure switch available separately, see valve options.
### Electrical Connectors

<table>
<thead>
<tr>
<th>Electrical Connector Form</th>
<th>Electrical Connector Type</th>
<th>Cord Length meters (feet)</th>
<th>Cord Diameter</th>
<th>Electrical Connector Model Number Without Light</th>
<th>Lighted Connector</th>
</tr>
</thead>
<tbody>
<tr>
<td>DIN 43650 Form A</td>
<td>Pre wired Connector (18 gauge)</td>
<td>2 (6½)</td>
<td>6-mm</td>
<td>721K77</td>
<td>720K77-W 720K77-Z</td>
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<tr>
<td>DIN 43650 Form A</td>
<td>Pre wired Connector (18 gauge)</td>
<td>2 (6½)</td>
<td>10-mm</td>
<td>371K77</td>
<td>383K77-W 383K77-Z</td>
</tr>
<tr>
<td>DIN 43650 Form A</td>
<td>Connector for threaded conduit (1/2 inch electrical conduit fittings)</td>
<td>–</td>
<td>–</td>
<td>723K77</td>
<td>724K77-W 724K77-Z</td>
</tr>
<tr>
<td>DIN 43650 Form A</td>
<td>Connector Only</td>
<td>–</td>
<td>–</td>
<td>937K87</td>
<td>936K87-W 936K87-Z</td>
</tr>
</tbody>
</table>

**CAUTIONS:** Do not use electrical connectors with surge suppressors, as this may increase valve response time when de-actuating the solenoids.

### Status Indicator

The Status Indicator pressure switch actuates when the valve is in a ready-to-run condition and de-actuates when the valve is in a lockout condition or when the inlet air pressure has been removed. Although, the valves can be purchased with this option already installed, the Status Indicator can be purchased separately.

#### Reset Valves for DOUBLE VALVES with REMOTE RESET

Valves with the remote reset option require a small 3/2 reset valve and the installation of a 1/8 inch air line from the reset valve to the reset port of the double valve. ROSS offers 3/2 normally closed valves with either manual or electric control that are suitable for this purpose.

<table>
<thead>
<tr>
<th>Reset Valves</th>
<th>Model Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flush Pushbutton: Green</td>
<td>1223B1FPG</td>
</tr>
<tr>
<td>Mushroom Button: Green</td>
<td>1223B1MBG</td>
</tr>
<tr>
<td>Direct Solenoid Control for Line Mounting</td>
<td>W1413A1409**</td>
</tr>
<tr>
<td>Direct Solenoid Control for Base Mounting</td>
<td>W1413A1409**</td>
</tr>
</tbody>
</table>

* NPT threads. For BSPP threads add a “D” prefix to the model number, e.g., D1223B1FPG.
** Insert voltage code: “W” = 24 volts DC; “Z” = 110-120 volts AC, 50/60 Hz; e.g., 1613B1020W.

**G**

**IMPORTANT NOTE:** Please read carefully and thoroughly all of the CAUTIONS, WARNINGS on the inside back cover.

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DOUBLE VALVES FOR CLUTCH/BRAKE CONTROL
SERPAR® 35 SERIES

www.rosscontrols.com
SERPAR® DOUBLE VALVES 35 SERIES DOUBLE VALVES WITH INTERNAL MONITORING & LOCKOUT – KEY FEATURES

- Internal monitoring – requires no additional monitoring circuitry
- Automatic lock-out/inhibit upon detection of a malfunction
- Default to de-energized position upon fault detection
- Dedicated reset function
- No undesired automatic reset upon removal of electrical or pneumatic energy sources
- Built-in non-clogging silencers on Sizes 4, 8, 12 and 30

35 Series SERPAR® valves are internally monitored double valves and are available in Size 4, 8, 12 and 30 ranging from 3/8” – 1½” port sizes. Internally monitored double valves contain a built-in monitoring device that checks for the proper operation of each valve element. If the internal monitor detects a valve fault on a particular cycle, the double valve will fail to a safe condition (all downstream air is exhausted) and the monitor will lock-out to inhibit further operation of the device. Normal operation can only be resumed by a momentary reset signal to the valve, either pneumatic or electric.

The original application for these double valves was in the control of clutch/brake mechanisms on stamping presses, but they have found their way into many other critical applications such as alternative lockout systems for energy isolation, air cylinder press load-holding systems, as well as other Category -3 and -4 safety circuits. ROSS double valves are a vital part of any control-reliable fluid power control system.

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>Page</th>
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<tr>
<td>SERPAR® Double Valves with L-G Monitor Size 4</td>
<td>G2.3 - G2.4</td>
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<tr>
<td>SERPAR® Double Valves with L-G Monitor Size 8, 12, 30</td>
<td>G2.5 - G2.6</td>
</tr>
<tr>
<td>SERPAR® Double Valves with E-P Monitor Size 8, 12, 30</td>
<td>G2.7 - G2.8</td>
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<tr>
<td>SERPAR® Double Valves with D-S Monitor Size 8, 12, 30</td>
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</tbody>
</table>
G2.3

IMPORTANT NOTE: Please read carefully and thoroughly all of the CAUTIONS, WARNINGS on the inside back cover.

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Rev. 05/16

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Valve Response Time

The constants above, designated M and F, can be used to determine the amount of time required to fill or exhaust a volume of any size using the formula on the right:

Viv. Resp. Time (msec) = \( M + F \cdot V \)

\( M \) = avg. time for parts movement
\( F \) = msec. per cubic inch of volume
\( V \) = volume in cubic inches

**Reset Valves for L-G Monitor**

On valve models with manual reset a button on the side of the monitor is pushed to perform the reset function. Models for remote reset, however, require a small reset valve and the installation of a 1/8 line from the reset valve to the reset port on the monitor. ROSS offers 3/2 normally closed valves with either manual or electric control that are suitable for this purpose, valves size 8, 12, 30 with L-G monitor are suggested.

<table>
<thead>
<tr>
<th>Description</th>
<th>Model Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flush Pushbutton: Green</td>
<td>1223B1FPG</td>
</tr>
<tr>
<td>Mushroom Button: Green</td>
<td>1223B1MBG</td>
</tr>
<tr>
<td>Direct Solenoid Control for Line Mounting</td>
<td>1613B1020**</td>
</tr>
<tr>
<td>Direct Solenoid Control for Base Mounting</td>
<td>W1413A1409** (Base: 516B91)</td>
</tr>
</tbody>
</table>

**Pressure Switches**

(For Electrical Lockout Indicator)

- DIN 43650 Form A: 586A86 (1/8 NPT)
- M12 Micro-DC: 1153A30 (1/8 NPT)

**Piping Flange Kits**

Each kit includes two threaded (NPT) flanges and the required seals and mounting bolts.

<table>
<thead>
<tr>
<th>Port Size</th>
<th>Basic Size</th>
<th>Kit Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/8</td>
<td>4</td>
<td>658K77</td>
</tr>
<tr>
<td>1/2</td>
<td>4</td>
<td>659K77</td>
</tr>
<tr>
<td>3/4</td>
<td>4</td>
<td>660K77</td>
</tr>
</tbody>
</table>

**Valve Without Silencer**

Exhaust port has threaded flange only, consult ROSS.

**Construction:** Dual poppet.

**Mounting Type:** Inline.

**Pilot Solenoids:** Two, rated for continuous duty.

**Standard Voltages:** 24 volts DC; 110-120 volts AC, 50/60 Hz.

**Power Consumption** (each solenoid): 30 VA inrush, 16 VA holding on 50 or 60 Hz; 11 watts on DC.

**Electrical Connections:** Cord-grip connectors at solenoids.

**Ambient Temperature:** 40° to 120°F (4° to 50°C).

**Media Temperature:** 40° to 175°F (4° to 80°C).

**Flow Media:** Filtered air.

**Inlet Pressure:** 30 to 100 psig (2 to 7 bar).

**L-G Reset Pressure:** Remote pneumatic reset models require a pressure of at least 30 psig (2 bar). Manual reset models use internal valve pressure.

**Inlet Port:** Models are available with the inlet port on either the right or the left side of the valve body.

**Standard Specifications** (for valves on this page):

**Pressure Switches (Electrical Lockout Indicator):**

- DIN 43650 Form A: 586A86 (1/8 NPT)
- M12 Micro-DC: 1153A30 (1/8 NPT)

**Connection Type**

- DIN 43650 Form A: DIN 43650 Form A 586A86 (1/8 NPT)
- M12 Micro-DC: M12 Micro-DC 1153A30 (1/8 NPT)

**Port Threads**

- DIN: 1/8 NPT
- M12: 1/8 NPT

**Pressure Switches**

- Normally Open: Pin 4
- Normally Closed: Pin 3
- Ground: Pin 2
- Common: Pin 1

**Pressure Switch**

Closes on falling pressure of 5 psig (0.34 bar).

* NPT port threads. For BSPP threads, add a “D” prefix to the model number, e.g., D3573D4241W.

** Insert voltage code: “W” = 24 volts DC; “Z” = 110-120 volts AC, 50/60 Hz; e.g., 3573D4241W. For other voltages consult ROSS.

**Valve Without Silencer**

Exhaust port has threaded flange only, consult ROSS.

**Standard Specifications** (for valves on this page):

**Construction:** Dual poppet.

**Mounting Type:** Inline.

**Pilot Solenoids:** Two, rated for continuous duty.

**Standard Voltages:** 24 volts DC; 110-120 volts AC, 50/60 Hz.

**Power Consumption** (each solenoid): 30 VA inrush, 16 VA holding on 50 or 60 Hz; 11 watts on DC.

**Electrical Connections:** Cord-grip connectors at solenoids.

**Ambient Temperature:** 40° to 120°F (4° to 50°C).

**Media Temperature:** 40° to 175°F (4° to 80°C).

**Flow Media:** Filtered air.

**Inlet Pressure:** 30 to 100 psig (2 to 7 bar).

**L-G Reset Pressure:** Remote pneumatic reset models require a pressure of at least 30 psig (2 bar). Manual reset models use internal valve pressure.

**Inlet Port:** Models are available with the inlet port on either the right or the left side of the valve body.

**IMPORTANT NOTE:** Please read carefully and thoroughly all of the CAUTIONS, WARNINGS on the inside back cover.
**L-G Monitor Locked-out:**
When the L-G spool shifts it is held by a lockout pin (not shown). Pilot air is then exhausted to atmosphere via port YB, and pilot supply air is diverted to atmosphere via port YA. The lockout mechanism must be reset before the valve can return to normal operation. During and following reset, the pilot solenoids must be kept de-energized to prevent inadvertent and possibly dangerous cycling of the press. The reset function is either manual or remote-pneumatic depending on valve model.

**Detecting a Malfunction:**
A malfunction in the system or the valve itself could cause one valve element to be open and the other closed. Air then flows past the inlet poppet on valve element A, into crossflow passage D, but is substantially blocked by the spool portion of element B. The large size of the open exhaust passage past element B keeps the pressure at the outlet port below two percent of inlet pressure. Full monitoring air pressure from side A goes to the right end of spool S, and a reduced pressure goes to the left end. This pressure imbalance causes the spool to shift to the left. This shuts off and exhausts pilot air to both solenoid pilots, and allows valve element A to return to the closed position.

**Conditions at Start:**
Inlet 1 is closed to outlet 2 by both valve elements A and B. Outlet 2 is open to exhaust 3. Pilot air is ported from inlet 1 and through the center section of spool S to the normally closed pilots Pa and Pb. Monitoring pressure signals at both ends of spool S are exhausted.

**Normal Operation:**
Simultaneously energizing both solenoids actuates both pilots and causes valve elements A and B to shift. Inlet 1 is then connected to outlet 2 via crossflow passages C and D. Exhaust 3 is closed. Monitoring pressure signals go to each end of spool S and become equal to inlet pressure.

**IMPORTANT NOTE:** Please read carefully and thoroughly all of the **CAUTIONS, WARNINGS** on the inside back cover.

---

**CAUTIONS:** Do not use electrical connectors with surge suppressors, as this may increase valve response time when de-actuating the solenoids.

---

**ELECTRICAL CONNECTORS**

<table>
<thead>
<tr>
<th>Electrical Connector Form</th>
<th>Electrical Connector Type</th>
<th>Cord Length meters (feet)</th>
<th>Cord Diameter</th>
<th>Electrical Connector Model Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>DIN 43650 Form A</td>
<td>Prewired Connector (18 gauge)</td>
<td>2 (6½)</td>
<td>6-mm</td>
<td>Without Light: 721K77, Lighted Connector: 720K77-W, 720K77-Z</td>
</tr>
<tr>
<td>DIN 43650 Form A</td>
<td>Prewired Connector (18 gauge)</td>
<td>2 (6½)</td>
<td>10-mm</td>
<td>Without Light: 371K77, Lighted Connector: 383K77-W, 383K77-Z</td>
</tr>
<tr>
<td>DIN 43650 Form A</td>
<td>Connector for threaded conduit (1/2 inch electrical conduit fittings)</td>
<td>2 (6½)</td>
<td>6-mm</td>
<td>Without Light: 723K77, Lighted Connector: 724K77-W, 724K77-Z</td>
</tr>
<tr>
<td>DIN 43650 Form A</td>
<td>Connector Only</td>
<td>2 (6½)</td>
<td>6-mm</td>
<td>Without Light: 937K87, Lighted Connector: 936K87-W, 936K87-Z</td>
</tr>
</tbody>
</table>

---

**WARNING:** If monitor must be reset, electrical signals to both solenoids must be removed to prevent the machine controlled by the valve from immediately recycling and producing a potentially hazardous condition.
Serpar® Double Valves
with L-G Monitor, Size 8, 12, 30
35 Series

**Valve Response Time**
The constants above, designated M and F, can be used to determine the amount of time required to fill or exhaust a volume of any size using the formula on the right:

\[ \text{Valve Resp. Time (msec)} = M + F \times V \]

- **M** = avg. time for parts movement
- **F** = msec. per cubic inch of volume
- **V** = volume in cubic inches

**RESET VALVES** for L-G MONITOR
Models for remote reset, however, require a small reset valve and the installation of a 1/8 line from the reset valve to the reset port on the monitor. ROSS offers 3/2 normally closed valves with either manual or electric control that are suitable for this purpose, valves size 8, 12, 30 with L-G monitor are suggested.

**Valve Without Silencer**
Exhaust port has threaded flange only, consult ROSS.

**STANDARD SPECIFICATIONS** (for valves on this page):
- **Construction**: Dual poppet.
- **Mounting Type**: Inline.
- **Pilot Solenoids**: Two, rated for continuous duty.
- **Standard Voltages**: 24 volts DC; 110-120 volts AC, 50/60 Hz.
- **Power Consumption** (each solenoid): 87 VA inrush, 30 VA holding on 50 or 60 Hz; 14 watts on DC.
- **Electrical Connections**: Uses terminal strip connectors.
- **Ambient Temperature**: 40° to 120°F (4° to 50°C).
- **Media Temperature**: 40° to 175°F (4° to 80°C).
- **Flow Media**: Filtered air.
- **Inlet Pressure**: 30 to 125 psig (2 to 8.5 bar).
- **L-G Reset Pressure**: 60 psig (4 bar) minimum.

**ACCESSORIES & OPTIONS**

**Pressure Switches** (Electrical Lockout Indicator)

- **Connection Type**: DIN 43650 Form A
- **Model Number**: 586A86
- **Port Threads**: 1/8 NPT

**Valve Without Piping Flanges**

<table>
<thead>
<tr>
<th>Port Size</th>
<th>Basic Size</th>
<th>Model Number*</th>
<th>Avg. Response Constants</th>
<th>Weight lb (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/2, 3/4, 1</td>
<td>8</td>
<td>3573A4202**</td>
<td>M=3.5, F=8.5</td>
<td>16.3 (7.4)</td>
</tr>
<tr>
<td>3/4, 1, 1½</td>
<td>12</td>
<td>3573A5202**</td>
<td>M=4.0, F=12</td>
<td>25.2 (11.4)</td>
</tr>
<tr>
<td>1, 1½</td>
<td>30</td>
<td>3573A7202**</td>
<td>M=4.5, F=15</td>
<td>37.5 (17.0)</td>
</tr>
</tbody>
</table>

**Piping Flange Kits**
Each kit includes two threaded (NPT) flanges and the required seals and mounting bolts.

<table>
<thead>
<tr>
<th>Port Size</th>
<th>Basic Size</th>
<th>Pipe Flange Kit Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/2</td>
<td>8</td>
<td>661K77</td>
</tr>
<tr>
<td>3/4</td>
<td>8</td>
<td>662K77</td>
</tr>
<tr>
<td>1</td>
<td>8</td>
<td>663K77</td>
</tr>
<tr>
<td>1</td>
<td>12</td>
<td>664K77</td>
</tr>
<tr>
<td>1½</td>
<td>12</td>
<td>665K77</td>
</tr>
<tr>
<td>1¼</td>
<td>30</td>
<td>666K77</td>
</tr>
<tr>
<td>1½</td>
<td>30</td>
<td>667K77</td>
</tr>
</tbody>
</table>

**Reset Valves**

- **Flush Pushbutton: Green**
- **Mushroom Button: Green**
- **Direct Solenoid Control for Line Mounting**
- **Direct Solenoid Control for Base Mounting**

**Valve Without Silencer**
Exhaust port has threaded flange only, consult ROSS.

**STANDARD SPECIFICATIONS** (for valves on this page):
- **Construction**: Dual poppet.
- **Mounting Type**: Inline.
- **Pilot Solenoids**: Two, rated for continuous duty.
- **Standard Voltages**: 24 volts DC; 110-120 volts AC, 50/60 Hz.
- **Power Consumption** (each solenoid): 87 VA inrush, 30 VA holding on 50 or 60 Hz; 14 watts on DC.
- **Electrical Connections**: Uses terminal strip connectors.
- **Ambient Temperature**: 40° to 120°F (4° to 50°C).
- **Media Temperature**: 40° to 175°F (4° to 80°C).
- **Flow Media**: Filtered air.
- **Inlet Pressure**: 30 to 125 psig (2 to 8.5 bar).
- **L-G Reset Pressure**: 60 psig (4 bar) minimum.

**IMPORTANT NOTE**: Please read carefully and thoroughly all of the **CAUTIONS, WARNINGS** on the inside back cover.
Both solenoids must be energized simultaneously to shift the valve; maintained signal required to keep valve shifted.

**WARNING:** If monitor must be reset, electrical signals to both solenoids must be removed to prevent the machine controlled by the valve from immediately recycling and producing a potentially hazardous condition.

**IMPORTANT NOTE:** Please read carefully and thoroughly all of the CAUTIONS, WARNINGS on the inside back cover.
IMPORTANT NOTE: Please read carefully and thoroughly all of the CAUTIONS, WARNINGS on the inside back cover.

During lock-out: Terminals 3 and 7 are connected which allows a panel light, bell, or other electrical device to be wired through terminals 7 and 3 to serve as a lockout indicator.

---

**SERPAR® Double Valves**

**with E-P Monitor**

**35 Series**

### TABLE 1: SINGLE SIGNAL INPUT DUAL SIGNAL INPUT

<table>
<thead>
<tr>
<th>Port Size</th>
<th>Basic Size</th>
<th>Model Number*</th>
<th>C_v</th>
<th>Avg. Response Constants</th>
<th>Weight lb (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/2</td>
<td>8</td>
<td>3573A4141**</td>
<td>3.5</td>
<td>8.5</td>
<td>15 0.70 0.30</td>
</tr>
<tr>
<td>3/4</td>
<td>8</td>
<td>3573A5141**</td>
<td>4.0</td>
<td>12</td>
<td>15 0.65 0.23</td>
</tr>
<tr>
<td>3/4</td>
<td>12</td>
<td>3573A5151**</td>
<td>8.0</td>
<td>15</td>
<td>15 0.65 0.23</td>
</tr>
<tr>
<td>1</td>
<td>8</td>
<td>3573A6151**</td>
<td>4.0</td>
<td>12</td>
<td>20 0.33 0.21</td>
</tr>
<tr>
<td>1</td>
<td>12</td>
<td>3573A6161**</td>
<td>8.5</td>
<td>19</td>
<td>20 0.28 0.21</td>
</tr>
<tr>
<td>1¼</td>
<td>12</td>
<td>3573A7161**</td>
<td>9.0</td>
<td>21</td>
<td>20 0.28 0.21</td>
</tr>
<tr>
<td>1½</td>
<td>30</td>
<td>3573A8161**</td>
<td>21</td>
<td>43</td>
<td>25 0.18 0.07</td>
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<tr>
<td>2</td>
<td>30</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**Valve Response Time**

The constants above, designated M and F, can be used to determine the amount of time required to fill or exhaust a volume of any size using the formula below:

\[
\text{Vlv. Resp. Time (msec)} = M + F \times V
\]

where:
- \( M \) = avg. time for parts movement
- \( F \) = msec. per cubic inch of volume
- \( V \) = volume in cubic inches

---

**STANDARD SPECIFICATIONS** (for valves on this page):

- **Construction:** Dual poppet.
- **Mounting Type:** Inline.
- **Pilot Solenoids:** Two, rated for continuous duty.
- **Standard Voltages:** 24 volts DC; 110-120 volts AC, 50/60 Hz.
- **Power Consumption** (each solenoid): 87 VA inrush, 30 VA holding on 50 or 60 Hz; 14 watts on DC.

---

**Options**

**Valve Without Piping Flanges**

<table>
<thead>
<tr>
<th>Port Size</th>
<th>Basic Size</th>
<th>Model Number*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/2, 3/4, 1</td>
<td>8</td>
<td>3573A4201**</td>
</tr>
<tr>
<td>3/4, 1, 1¼</td>
<td>12</td>
<td>3573A5201**</td>
</tr>
<tr>
<td>1¼, 1½</td>
<td>30</td>
<td>3573A7201**</td>
</tr>
</tbody>
</table>

---

**Piping Flange Kits**

Each kit includes two threaded (NPT) flanges and the required seals and mounting bolts.

<table>
<thead>
<tr>
<th>Port Size</th>
<th>Basic Size</th>
<th>Kit Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/2</td>
<td>8</td>
<td>661K77</td>
</tr>
<tr>
<td>3/4</td>
<td>8</td>
<td>662K77</td>
</tr>
<tr>
<td>1</td>
<td>8</td>
<td>663K77</td>
</tr>
<tr>
<td>3/4</td>
<td>12</td>
<td>664K77</td>
</tr>
<tr>
<td>1</td>
<td>12</td>
<td>665K77</td>
</tr>
<tr>
<td>1¼</td>
<td>12</td>
<td>666K77</td>
</tr>
<tr>
<td>1½</td>
<td>30</td>
<td>667K77</td>
</tr>
<tr>
<td>2</td>
<td>30</td>
<td>668K77</td>
</tr>
</tbody>
</table>

---

**Valve Without Silencer**

Exhaust port has threaded flange only, consult ROSS.

---

**IMPORTANT NOTE:** Please read carefully and thoroughly all of the CAUTIONS, WARNINGS on the inside back cover.

---

For other voltages consult ROSS.

---

* NPT port threads. For BSPP threads, add a “D” prefix to the model number, e.g., D3573A4141W.

** Insert voltage code: “W” = 24 volts DC; “Z” = 110-120 volts AC, 50/60 Hz; e.g., 3573A4141W. For other voltages consult ROSS.
**E-P Monitor Locked-out:**

With both valve elements closed, monitoring air pressure is exhausted from both ends of spool S so that it returns to its normal position. The electrical circuit to the pilot solenoids remains broken by switch SW. To restore the electrical circuit and return the valve to normal operation, the reset solenoid (not shown) must be briefly energized to reset switch SW. *During and following reset, the pilot solenoids must be kept de-energized to prevent inadvertent and possibly dangerous cycling of the press.* Prolonged energizing of the reset solenoid can cause burnout and nullify the reset function.

**Detecting a Malfunction:**

A malfunction in the system or the valve itself could cause one valve element to be open and the other closed. Air then flows past the inlet poppet on valve element A, into crossflow passage D, but is substantially blocked by the spool portion of element B. The large size of the open exhaust passage past element B keeps the pressure at the outlet port below two percent of inlet pressure. Full monitoring pressure from side A goes to the right end of spool S, and a reduced pressure goes to the left end. This pressure imbalance causes the spool to shift to the left. This trips switch SW, breaks the electrical circuit to the pilot solenoids, and allows valve element A to return to the closed position.

**Conditions at Start:**

Inlet 1 is closed to outlet 2 by both valve elements A and B. Outlet 2 is open to exhaust 3. Contacts of switch SW are closed. Monitoring pressure signals at both ends of spool S are exhausted.

**Normal Operation:**

Simultaneously energizing both solenoids actuates both pilots and causes valve elements A and B to shift. Inlet 1 is then connected to outlet 2 via crossflow passages C and D. Exhaust 3 is closed. Monitoring pressure signals go to each end of spool S and become equal to inlet pressure.

**Completion of Normal Cycle:**

Simultaneously de-energizing both solenoids returns the valve to the “Conditions at Start” described above.

---

**IMPORTANT NOTE:** Please read carefully and thoroughly all of the **CAUTIONS, WARNINGS** on the inside back cover.
**SERPAR® Double Valves**

**with D-S Monitor**

**35 Series**

### Valve Response Time

The constants above, designated M and F, can be used to determine the amount of time required to fill or exhaust a volume of any size using the formula below:

\[ \text{Vlv. Resp. Time (msec)} = M + F \times V \]

- **M** = avg. time for parts movement
- **F** = msec. per cubic inch of volume
- **V** = volume in cubic inches

### Options

#### Valve Without Piping Flanges

<table>
<thead>
<tr>
<th>Port Size</th>
<th>Basic Size</th>
<th>Model Number*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/2, 3/4, 1</td>
<td>8</td>
<td>3573A4203**</td>
</tr>
<tr>
<td>3/4, 1, 1¼</td>
<td>12</td>
<td>3573A5203**</td>
</tr>
<tr>
<td>1¼, 1½</td>
<td>30</td>
<td>3573A7203**</td>
</tr>
</tbody>
</table>

* NPT port threads. For BSPP threads, add a “D” prefix to the model number, e.g., D3573A4203W.

** Insert voltage code: “W” = 24 volts DC; “Z” = 110-120 volts AC, 50/60 Hz; e.g., 3573A4203W. For other voltages consult ROSS.

#### Piping Flange Kits

Each kit includes two threaded (NPT) flanges and the required seals and mounting bolts.

<table>
<thead>
<tr>
<th>Port Size</th>
<th>Basic Size</th>
<th>Kit Number</th>
</tr>
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<tbody>
<tr>
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<td>8</td>
<td>663K77</td>
</tr>
<tr>
<td>3/4</td>
<td>12</td>
<td>664K77</td>
</tr>
<tr>
<td>1</td>
<td>12</td>
<td>665K77</td>
</tr>
<tr>
<td>1¼</td>
<td>12</td>
<td>666K77</td>
</tr>
<tr>
<td>1½</td>
<td>30</td>
<td>668K77</td>
</tr>
</tbody>
</table>

#### Valve Without Silencer

Exhaust port has threaded flange only, consult ROSS.

### STANDARD SPECIFICATIONS (for valves on this page):

- **Construction:** Dual poppet.
- **Mounting Type:** Inline.
- **Pilot Solenoids:** Two, rated for continuous duty.
- **Standard Voltages:** 24 volts DC; 110-120 volts AC, 50/60 Hz.
- **Power Consumption** (each solenoid): 87 VA inrush, 30 VA holding on 50 or 60 Hz; 14 watts on DC.
- **D-S Monitor:** Rated for same voltage as pilot solenoids. Power supply to monitor must be independent and continuous.
- **Ambient Temperature:** 40° to 120°F (4° to 50°C).
- **Media Temperature:** 40° to 175°F (4° to 80°C).
- **Flow Media:** Filtered air.
- **Pressure Range:** 30 to 125 psig (2 to 8.5 bar).

**IMPORTANT NOTE:** Please read carefully and thoroughly all of the **CAUTIONS, WARNINGS** on the inside back cover.

[www.rosscontrols.com](http://www.rosscontrols.com)
Normal Operation:
Simultaneously energizing both solenoids actuates both pilots and causes valve elements A and B to shift. Inlet 1 is then connected to outlet 2 via crossflow passages C and D. Exhaust 3 is closed. Monitoring pressure signals go to pressure indicators Ia and Ib, causing the indicator pins to be extended and to actuate proximity switches SWa and SWb. In normal operation, each pair - solenoids, valve elements, indicators, and proximity switches - responds in unison so that the comparator circuits “read” the operation as normal.

Completion of Normal Cycle:
Simultaneously de-energizing both solenoids returns the valve to the “Conditions at Start” described above.

Detecting a Malfunction:
A malfunction in the system or the valve itself could cause one valve element to be open and the other closed. Air then flows past the inlet poppet on valve element A, into crossflow passage D, but is substantially blocked by the spool portion of element B. The large size of the open exhaust passage past element B keeps the pressure at the outlet port below two percent of inlet pressure. Full monitoring air pressure from side A goes to pressure indicator Ia so that its pin is extended and actuates proximity switch SWa. When the time interval between the signal to a solenoid and the signal from its corresponding proximity switch exceeds approximately 175 milliseconds, the D-S monitor breaks contacts Sa and Sb as soon as solenoid power is removed. This allows valve element A to return to the closed position.

D-S Monitor Locked-out:
With the valve locked out by contacts Sa and Sb, solenoids Pa and Pb cannot be energized. The monitor must be reset before another valve cycle can begin. Reset can be achieved by a separately connected ancillary switch, but not if the pilot solenoids are energized. The monitor can be reset by removing and reapplying power to the monitor even when the pilot solenoids are energized. For this reason it is necessary to have the pilot solenoids de-energized during and following reset to prevent inadvertent and possibly dangerous cycling of the press.
Double Valves for Clutch/Brake Control
SERPAR® Crossflow 35 Series

www.rosscontrols.com
SERPAR® CROSSFLOW DOUBLE VALVES 35 SERIES WITH PRESSURE SWITCHES FOR EXTERNAL MONITORING – KEY FEATURES

- Designed to enable users to comply with current safety regulations
- Can be integrated with external monitoring systems to provide for lockout and inhibiting further machine operation until the controls system is reset
- Default to de-energized position upon fault condition
- Built-in non-clogging silencers on Sizes 4, 8, 12 and 30

Size 1 and 2 SERPAR® Crossflow valves with pressure switches (for external monitoring) are available from ¼” to ¾” port sizes. Externally monitored double valves provide feedback signals (via the pressure switches), which allows the main press controls, or separate monitoring device, The original application for these double valves was in the control of clutch/brake mechanisms on stamping presses, but they have found their way into many other critical applications such as alternative lockout systems for energy isolation, air cylinder press load-holding systems, as well as other Category -3 and -4 safety circuits. ROSS double valves are a vital part of any control-reliable fluid power control system.

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERPAR® Crossflow Double Valves with or without Pressure Switches Size 1</td>
<td>G3.3 - G3.4</td>
</tr>
<tr>
<td>SERPAR® Crossflow Double Valves with or without Pressure Switches Size 2</td>
<td>G3.5 - G3.6</td>
</tr>
<tr>
<td>SERPAR® Crossflow Double Valves with Pressure Switches Size 4</td>
<td>G3.7</td>
</tr>
<tr>
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<td>G3.8 - G3.9</td>
</tr>
</tbody>
</table>
SERPAR® Crossflow Double Valves
with or without Pressure Switches, Size 1

35 Series

### Accessories & Options

**Electrical Connectors**

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Electrical Connector Model Number</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Without Light</td>
</tr>
<tr>
<td></td>
<td>24 Volts DC</td>
</tr>
<tr>
<td>Prewired Connector (18 gauge)</td>
<td>266K87</td>
</tr>
<tr>
<td>Connector Only</td>
<td>372K77</td>
</tr>
</tbody>
</table>

**CAUTIONS:** Do not use electrical connectors with surge suppressors, as this may increase valve response time when de-actuating the solenoids.

### Silencers

<table>
<thead>
<tr>
<th>Port Size</th>
<th>Thread Type</th>
<th>Model Number</th>
<th>Avg. CV</th>
<th>Dimensions (inch)</th>
<th>Weight (lb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/4</td>
<td>Male</td>
<td>5500A2003</td>
<td>2.1</td>
<td>A: 0.9 (21) B: 2.2 (55)</td>
<td>0.1 (0.1)</td>
</tr>
<tr>
<td>3/8</td>
<td>Male</td>
<td>5500A3013</td>
<td>2.7</td>
<td>A: 0.9 (21) B: 2.2 (55)</td>
<td>0.1 (0.1)</td>
</tr>
</tbody>
</table>

**Pressure Range:** 0 to 150 psig (0 to 10.3 bar) maximum. **Flow Media:** Filtered air.

### STANDARD SPECIFICATIONS (for valves on this page):

**Construction:** Dual poppet.

**Mounting Type:**Inline.

**Pilot Solenoids:** Two, rated for continuous duty.

**Standard Voltages:** 24 volts DC; 110-120 volts AC; 50/60 Hz.

**Power Consumption** (each solenoid): 12 VA maximum inrush, 9.8 VA maximum holding on 50 or 60 Hz; 7.5 watts nominal on DC.

**Electrical Connections:** Uses two cord-grip connectors at solenoids. DIN 43650 Form B connector P/N 266K77.

**Ambient Temperature:** 40° to 120°F (4° to 50°C).

**Media Temperature:** 40° to 175°F (4° to 80°C).

**Flow Media:** Filtered air.

**Inlet Pressure:** 40 to 100 psig (2.8 to 7 bar).

**Functional Safety Data:** Category 4 PL e; B10d: 20,000,000; PFHd: 7.71x10⁻⁹ ; MTTFd: 301.9 (nop: 662400).

**Certifications:** CE Marked, Galvanic isolator.

**Vibration/Impact Resistance:** Tested to BS EN 60068-2-27.
Detecting a Malfunction:
A malfunction in the system or the valve itself could cause one valve element to be open and the other closed. Air then flows past the inlet poppet on valve element A, into crossflow passage D, but is substantially blocked by the spool portion of element B. The large size of the open exhaust passage past element B keeps the pressure at the outlet port below 2% of inlet pressure. Full sensing air pressure from side A goes to switch SWA, and a reduced pressure goes to switch SWB. This full pressure signal causes switch SWA to trip. Switch SWB, with a reduced pressure signal, does not trip. An external monitoring system can detect the malfunction by monitoring the condition of the switches SWA and SWB. The external monitoring system may then react accordingly by shutting down the power to the valve solenoids and any other components deemed necessary to stop the machine.

Normal Operation:
Simultaneously energizing both solenoids actuates both pilots and causes valve elements A and B to shift. Inlet 1 is then connected to outlet 2 via crossflow passages C and D. Exhaust 3 is closed. Sensing pressure signals go to each pressure switch and become equal to inlet pressure. Both switches trip and now contacts 1 and 4 of switches SWA and SWB are connected instead of contacts 1 and 2.

Completion of Normal Cycle:
Simultaneously de-energizing both solenoids returns the valve to the “Conditions at Start” described at left.

CAUTION:
If the monitor must be reset, electrical signals to both solenoids must be removed to prevent the machine controlled by the valve from immediately recycling and producing a potentially hazardous condition.

For replacement valve (less base), order model 3573B2602.

**Valve Operation:** Both solenoids must be energized simultaneously to shift the valve; maintained signal required to keep valve shifted.

**Base Dimensions – inches (mm)**

**Valve Operation**

**Conditions at Start:**
Inlet 1 is closed to outlet 2 by both valve elements A and B. Outlet 2 is open to exhaust 3. Pressure signals at both switches SWA and SWB are exhausted. Contacts 1 and 2 of switches SWA and SWB are connected.

**Normal Operation:**
Simultaneously energizing both solenoids actuates both pilots and causes valve elements A and B to shift. Inlet 1 is then connected to outlet 2 via crossflow passages C and D. Exhaust 3 is closed. Sensing pressure signals go to each pressure switch and become equal to inlet pressure. Both switches trip and now contacts 1 and 4 of switches SWA and SWB are connected instead of contacts 1 and 2.

**Completion of Normal Cycle:**
Simultaneously de-energizing both solenoids returns the valve to the “Conditions at Start” described at left.

**Detecting a Malfunction:**
A malfunction in the system or the valve itself could cause one valve element to be open and the other closed. Air then flows past the inlet poppet on valve element A, into crossflow passage D, but is substantially blocked by the spool portion of element B. The large size of the open exhaust passage past element B keeps the pressure at the outlet port below 2% of inlet pressure. Full sensing air pressure from side A goes to switch SWA, and a reduced pressure goes to switch SWB. This full pressure signal causes switch SWA to trip. Switch SWB, with a reduced pressure signal, does not trip. An external monitoring system can detect the malfunction by monitoring the condition of the switches SWA and SWB. The external monitoring system may then react accordingly by shutting down the power to the valve solenoids and any other components deemed necessary to stop the machine.

**IMPORTANT NOTE:** Please read carefully and thoroughly all of the **CAUTIONS, WARNINGS** on the inside back cover.
**Serpar® Crossflow Double Valves**

with or without Pressure Switches, Size 2

### 35 Series

<table>
<thead>
<tr>
<th>Port Sizes</th>
<th>Basic Size</th>
<th>Inlet Orientation</th>
<th>Pressure Switches</th>
<th>Pressure Switch Provision</th>
<th>Model Number*</th>
<th>Avg. Response Constants</th>
<th>Weight (lb/kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/2, 2</td>
<td>1/2, 2</td>
<td>Left Hand</td>
<td>None</td>
<td>No</td>
<td>3573C4620**</td>
<td>3.7 6.6 30 1.2 1.0</td>
<td>4.3 (1.95)</td>
</tr>
<tr>
<td>1/2, 2</td>
<td>1/2, 2</td>
<td>Left Hand</td>
<td>None</td>
<td>Yes</td>
<td>3573C4632**</td>
<td>3.7 6.6 30 1.2 1.0</td>
<td>4.3 (1.95)</td>
</tr>
<tr>
<td>1/2, 3/4</td>
<td>2</td>
<td>Left Hand</td>
<td>None</td>
<td>No</td>
<td>3573C4640**</td>
<td>3.7 9.0 25 1.1 0.9</td>
<td>4.3 (1.95)</td>
</tr>
<tr>
<td>1/2, 2</td>
<td>2</td>
<td>Left Hand</td>
<td>Two**</td>
<td>Yes</td>
<td>3573C4642**</td>
<td>3.7 6.6 30 1.2 1.0</td>
<td>4.8 (2.18)</td>
</tr>
<tr>
<td>3/4, 3/4</td>
<td>2</td>
<td>Left Hand</td>
<td>None</td>
<td>No</td>
<td>3573C4643**</td>
<td>4.2 9.0 25 1.1 0.9</td>
<td>4.7 (2.13)</td>
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<tr>
<td>3/4, 3/4</td>
<td>2</td>
<td>Left Hand</td>
<td>Two**</td>
<td>Yes</td>
<td>3573C4644**</td>
<td>4.2 9.0 25 1.1 0.9</td>
<td>5.2 (2.36)</td>
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<tr>
<td>1/2, 2</td>
<td>2</td>
<td>Left Hand</td>
<td>Two**</td>
<td>Yes</td>
<td>3573C4652**</td>
<td>3.7 9.0 25 1.1 0.9</td>
<td>4.3 (1.95)</td>
</tr>
<tr>
<td>1/2, 1</td>
<td>2</td>
<td>Right Hand</td>
<td>Two**</td>
<td>Yes</td>
<td>3573C4706**</td>
<td>3.7 9.0 30 1.2 1.0</td>
<td>4.3 (1.95)</td>
</tr>
<tr>
<td>3/4, 1</td>
<td>2</td>
<td>Right Hand</td>
<td>Two**</td>
<td>Yes</td>
<td>3573C4715**</td>
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<td>5.2 (2.36)</td>
</tr>
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<td>2</td>
<td>Left Hand</td>
<td>None</td>
<td>No</td>
<td>3573A4735**</td>
<td>3.7 9.0 30 1.2 1.0</td>
<td>4.3 (1.95)</td>
</tr>
<tr>
<td>1/2, 1</td>
<td>2</td>
<td>Left Hand</td>
<td>Two**</td>
<td>Yes</td>
<td>3573A4736**</td>
<td>3.7 9.0 30 1.2 1.0</td>
<td>4.3 (1.95)</td>
</tr>
<tr>
<td>3/4, 1</td>
<td>2</td>
<td>Left Hand</td>
<td>None</td>
<td>No</td>
<td>3573A4737**</td>
<td>4.2 9.0 25 1.1 0.9</td>
<td>5.2 (2.36)</td>
</tr>
<tr>
<td>3/4, 1</td>
<td>2</td>
<td>Left Hand</td>
<td>Two**</td>
<td>Yes</td>
<td>3573A4738**</td>
<td>3.7 9.0 25 1.1 0.9</td>
<td>5.2 (2.36)</td>
</tr>
<tr>
<td>3/4, 1</td>
<td>2</td>
<td>Right Hand</td>
<td>None</td>
<td>Yes</td>
<td>3573B4883**</td>
<td>4.2 9.0 25 1.1 0.9</td>
<td>5.2 (2.36)</td>
</tr>
<tr>
<td>1/2, 1</td>
<td>2</td>
<td>Right Hand</td>
<td>None</td>
<td>Yes</td>
<td>3573B4891**</td>
<td>4.2 9.0 30 1.2 1.0</td>
<td>4.3 (1.95)</td>
</tr>
</tbody>
</table>

* NPT port threads. For BSPP threads, add a “D” prefix to the model number, e.g., D3573C4620W.

** Insert voltage code: “W” = 24 volts DC; “Z” = 110-120 volts AC, 50/60 Hz; e.g., 3573C4620W. For other voltages consult ROSS.

Valve and base can be ordered separately, consult ROSS.

## Pressure Switches & Monitoring:

Valves without pressure switches must not be used to control clutch/brake mechanisms on press machinery. Valves with pressure switches must be used in conjunction with an external monitoring device to assist with OSHA compliance (Ref. 1910.217).

## Valve Operation:

Both solenoids must be energized simultaneously to shift the valve; maintained signal required to keep valve shifted.

**CAUTION:** If the monitor must be reset, electrical signals to both solenoids must be removed to prevent the machine controlled by the valve from immediately recycling and producing a potentially hazardous condition.

### STANDARD SPECIFICATIONS (for valves on this page):

- **Construction:** Dual poppet.
- **Mounting Type:** Inline.
- **Pilot Solenoids:** Two, rated for continuous duty.
- **Standard Voltages:** 24 volts DC; 110-120 volts AC, 50/60 Hz.
- **Power Consumption** (each solenoid): 8.5 VA maximum inrush, 8.5 VA maximum holding on 50 or 60 Hz; 6 watts nominal on DC.
- **Electrical Connections:** Uses two cord-grip connectors at solenoids. Din 43650 Form A connector P/N 937K87.
- **Ambient Temperature:** 40° to 120°F (4° to 50°C).
- **Media Temperature:** 40° to 175°F (4° to 80°C).
- **Flow Media:** Filtered air.
- **Inlet Pressure:** 40 to 100 psig (2.8 to 7 bar).
- **Functional Safety Data:** Category 4 PL e; B10d: 20,000,000; PFHd: 7.71x10⁻⁹; MTTFd: 301.9 (nop: 662400).
- **Certifications:** CE Marked for applicable directives, BG, CSA/UL.
- **Vibration/Impact Resistance:** Tested to BS EN 60068-2-27.

**IMPORTANT NOTE:** Please read carefully and thoroughly all of the **CAUTIONS, WARNINGS** on the inside back cover.
Valve Technical Data & Operation

Valve without Pressure Switches

Valve with Pressure Switches

**Valve Model**

- For replacement valve (less base), order model 3573B4602.

**ACCESSORIES**

<table>
<thead>
<tr>
<th>Electrical Connectors</th>
<th>Electrical Connector Form</th>
<th>Electrical Connector Type</th>
<th>Cord Length (feet)</th>
<th>Cord Diameter</th>
<th>Electrical Connector Model Number</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>DIN 43650 Form A</td>
<td>Prewired Connector (18 gauge)</td>
<td>2 (6)</td>
<td>6-mm</td>
<td>721K77, 720K77-W, 720K77-Z</td>
</tr>
<tr>
<td></td>
<td>DIN 43650 Form A</td>
<td>Prewired Connector (18 gauge)</td>
<td>2 (6)</td>
<td>10-mm</td>
<td>371K77, 383K77-W, 383K77-Z</td>
</tr>
<tr>
<td></td>
<td>DIN 43650 Form A</td>
<td>Connector for threaded conduit (1/2 inch electrical conduit fittings)</td>
<td>--</td>
<td>--</td>
<td>723K77, 724K77-W, 724K77-Z</td>
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<tr>
<td></td>
<td>DIN 43650 Form A</td>
<td>Connector Only</td>
<td>--</td>
<td>--</td>
<td>937K87, 936K87-W, 936K87-Z</td>
</tr>
</tbody>
</table>

**CAUTIONS:** Do not use electrical connectors with surge suppressors, as this may increase valve response time when de-actuating the solenoids.

**Silencers**

Conditions at Start:

- Inlet 1 is closed to outlet 2 by both valve elements A and B. Outlet 2 is open to exhaust 3. Pressure signals at both switches SWA and SWB are exhausted.
- Contacts 1 and 2 of switches SWA and SWB are connected.

Normal Operation:

- Simultaneously energizing both solenoids actuates both pilots and causes valve elements A and B to shift. Inlet 1 is then connected to outlet 2 via crossflow passages C and D. Exhaust 3 is closed. Sensing pressure signals go to each pressure switch and become equal to inlet pressure. Both switches trip and now contacts 1 and 4 of switches SWA and SWB are connected instead of contacts 1 and 2.

Completion of Normal Cycle:

- Simultaneously de-energizing both solenoids returns the valve to the “Conditions at Start” described at left.

Detecting a Malfunction:

- A malfunction in the system or the valve itself could cause one valve element to be open and the other closed. Air then flows past the inlet poppet on valve element A, into crossflow passage D, but is substantially blocked by the spool portion of element B. The large size of the open exhaust passage below 2% of inlet pressure. Full sensing air pressure from side A goes to switch SWA, and a reduced pressure goes to switch SWB. This full pressure signal causes switch SWA to trip. Switch SWB, with a reduced pressure signal, does not trip. An external monitoring system can detect the malfunction by monitoring the condition of the switches SWA and SWB. The external monitoring system may then react accordingly by shutting down the power to the valve solenoids and any other components deemed necessary to stop the machine.

**IMPORTANT NOTE:** Please read carefully and thoroughly all of the CAUTIONS, WARNINGS on the inside back cover.
**SERPAR® Crossflow Double Valves with Pressure Switches, Size 4**

### 35 Series

<table>
<thead>
<tr>
<th>Port Size</th>
<th>Basic Size</th>
<th>Model Number*#</th>
<th>C&lt;sub&gt;v&lt;/sub&gt;</th>
<th>Weight lb (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/8</td>
<td>4</td>
<td>3573C3270**</td>
<td>3 7</td>
<td>8.4 (3.8)</td>
</tr>
<tr>
<td>1/2</td>
<td>4</td>
<td>3573C4270**</td>
<td>3 9</td>
<td>8.4 (3.8)</td>
</tr>
<tr>
<td>3/4</td>
<td>4</td>
<td>3573C5230**</td>
<td>3 11</td>
<td>8.4 (3.8)</td>
</tr>
</tbody>
</table>

* NPT port threads. For BSPP threads, add a “D” prefix to the model number, e.g., D3573C3270W. ** Insert voltage code: “W” = 24 volts DC; “Z” = 110-120 volts AC, 50/60 Hz; e.g., 3573C3270W. For other voltages consult ROSS.

## Valve Dimensions – inches (mm)

- Flanged-port model G 3/8 - G1/2: 7.4 (189) x 7.2 (185) x 6.1 (155)
- Flanged-port model G 3/4: 7.4 (189) x 7.2 (185) x 6.1 (155)

### Pressure Switches & Monitoring:

Valves with pressure switches must be used in conjunction with an external monitoring device to assist with OSHA compliance (Ref. 1910.217). The valves on this page do not have a built-in monitor, and so must only be used in conjunction with an external monitoring system. Such monitoring system must be capable of inhibiting the operation of the valve and associated machinery in the event of a failure within the valve.

**CAUTION:** If the system must be reset, electrical signals to both solenoids must be removed to prevent the machine from immediately recycling and producing a potentially hazardous condition.

### STANDARD SPECIFICATIONS

- **Construction:** Dual poppet.
- **Mounting Type:** Inline.
- **Pilot Solenoids:** Two, rated for continuous duty.
- **Standard Voltages:** 24 volts DC; 110-120 volts AC, 50/60 Hz. Voltages at pressure switches must not exceed 250 volts.
- **Power Consumption** (each solenoid): 35 VA maximum in-rush, 22 VA holding on 50 or 60 Hz; 14 watts nominal on DC.
- **Electrical Connections:** Uses cord-grip connectors at solenoids. Connectors according to DIN 43650 A (ISO 4400).
- **Enclosure Rating:** IP 65 according to IEC-Publication 144 and DIN 40050, Sheet 1.
- **Ambient Temperature:** 40° to 120°F (4° to 50°C).
- **Media Temperature:** 40° to 175°F (4° to 80°C).
- **Flow Media:** Filtered air.
- **Inlet Pressure:** 40 to 150 psig (2.5 to 10 bar).
- **Functional Safety Data:** Category 4 PL e; B10d: 20,000,000; PFHd: 7.71x10⁻⁹; MTTFd: 301.9 (nop: 662400).
- **Certifications:** CE Marked for applicable directives, BG, CSA/UL.
- **Vibration/Impact Resistance:** Tested to BS EN 60068-2-27.

### Accessories

<table>
<thead>
<tr>
<th>Electrical Connectors</th>
<th>Electrical Connector Form</th>
<th>Electrical Connector Type</th>
<th>Cord Length meters (feet)</th>
<th>Cord Diameter</th>
<th>Electrical Connector Model Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>DIN 43650 Form A</td>
<td>Premired Connector (18 gauge)</td>
<td>2 (6½)</td>
<td>6-mm</td>
<td>721K77, 722K77-W, 720K77-Z</td>
<td></td>
</tr>
<tr>
<td>DIN 43650 Form A</td>
<td>Premired Connector (18 gauge)</td>
<td>2 (6½)</td>
<td>10-mm</td>
<td>371K77, 383K77-W, 383K77-Z</td>
<td></td>
</tr>
<tr>
<td>DIN 43650 Form A</td>
<td>Connector for threaded conduit (1/2 inch electrical conduit fittings)</td>
<td>–</td>
<td>–</td>
<td>723K77, 724K77-W, 724K77-Z</td>
<td></td>
</tr>
<tr>
<td>DIN 43650 Form A</td>
<td>Connector Only</td>
<td>–</td>
<td>–</td>
<td>937K87, 936K87-W, 936K87-Z</td>
<td></td>
</tr>
</tbody>
</table>

**CAUTIONS:** Do not use electrical connectors with surge suppressors, as this may increase valve response time when de-actuating the solenoids.

### Valves Operation

Refer to page G3.9.
SERPAR® Crossflow Double Valves with Pressure Switches, Size 8, 12, & 30

<table>
<thead>
<tr>
<th>Port Size</th>
<th>Basic Size</th>
<th>Model Number*#</th>
<th>CV 1-2</th>
<th>CV 2-3</th>
<th>Weight lb (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/2</td>
<td>8</td>
<td>3573B4638**</td>
<td>3.5</td>
<td>10</td>
<td>11.4 (5.2)</td>
</tr>
<tr>
<td>3/4</td>
<td>8</td>
<td>3573B5638**</td>
<td>4</td>
<td>14</td>
<td>11.4 (5.2)</td>
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<tr>
<td>1</td>
<td>8</td>
<td>3573B6638**</td>
<td>4</td>
<td>14</td>
<td>11.4 (5.2)</td>
</tr>
<tr>
<td>3/4</td>
<td>12</td>
<td>3573B5632**</td>
<td>8</td>
<td>15</td>
<td>15.4 (7.0)</td>
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<tr>
<td>1</td>
<td>12</td>
<td>3573B6632**</td>
<td>8.5</td>
<td>19</td>
<td>15.4 (7.0)</td>
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<tr>
<td>1¼</td>
<td>12</td>
<td>3573B7632**</td>
<td>9</td>
<td>21</td>
<td>15.4 (7.0)</td>
</tr>
<tr>
<td>1½</td>
<td>30</td>
<td>3573B7630**</td>
<td>20</td>
<td>42</td>
<td>33.9 (15.4)</td>
</tr>
<tr>
<td>1¼</td>
<td>30</td>
<td>3573B8630**</td>
<td>21</td>
<td>43</td>
<td>33.9 (15.4)</td>
</tr>
</tbody>
</table>

* NPT port threads. For BSPP threads, add a “D” prefix to the model number, e.g., D3573B4638W.
** Insert voltage code: “W” = 24 volts DC; “Z” = 110-120 volts AC, 50/60 Hz; e.g., 3573B4638W.
For other voltages consult ROSS.
# Valve include pressure switches with DIN type connection, for pressure switches with M12 Micro-DC type connection consult ROSS.
Valve and base can be ordered separately, consult ROSS.

Pressure Switches & Monitoring: Valves with pressure switches must be used in conjunction with an external monitoring device to assist with OSHA compliance (Ref. 1910.217). The valves on this page do not have a built-in monitor, and so must only be used in conjunction with an external monitoring system. Such monitoring system must be capable of inhibiting the operation of the valve and associated machinery in the event of a failure within the valve.

** CAUTION:** If the system must be reset, electrical signals to both solenoids must be removed to prevent the machine from immediately recycling and producing a potentially hazardous condition.

Valve Dimensions – inches (mm)

Basic Size 8

- 11.2 \( (284) \)
- 6.72 \( (172) \)
- 8.8 \( (224) \)

Treaded-port model

Ambient Temperature: 40° to 120°F (4° to 50°C).
Media Temperature: 40° to 175°F (4° to 80°C).
Flow Media: Filtered air.
Inlet Pressure: 30 to 125 psig (2 to 8.5 bar).

Functional Safety Data:
Category 4 PL e; B10d: 20,000,000; PFHd: 7.71x10⁻⁹; MTTFd: 301.9 (n=662400).
Certifications: CE Marked for applicable directives, BG, CSA/UL.
Vibration/Impact Resistance: Tested to BS EN 60068-2-27.

STANDARD SPECIFICATIONS (for valves on this page):

Construction: Dual poppet.
Mounting Type: Inline.
Pilot Solenoids: Two, rated for continuous duty.
Standard Voltages: 24 volts DC; 110-120 volts AC, 50/60 Hz.
*Voltages at pressure switches must not exceed 250 volts.*
Power Consumption (each solenoid): 87 VA maximum in-rush, 30 VA holding on 50 or 60 Hz; 14 watts nominal on DC.
Enclosure Rating: IP 65 according to IEC-Publication 144 and DIN 40050, Sheet 1.

IMPORTANT NOTE: Please read carefully and thoroughly all of the CAUTIONS, WARNINGS on the inside back cover.
**Valve Dimensions – inches (mm)**

<table>
<thead>
<tr>
<th>Basic Size 12</th>
<th>Basic Size 30</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treaded-port model</td>
<td>Treaded-port model</td>
</tr>
<tr>
<td>7.0 (178)</td>
<td>10.3 (1267)</td>
</tr>
<tr>
<td>Flanged-port model</td>
<td>Flanged-port model</td>
</tr>
<tr>
<td>9.1 (230)</td>
<td>12.4 (315)</td>
</tr>
<tr>
<td>8.6 (219)</td>
<td>11.1 (282)</td>
</tr>
</tbody>
</table>

**ACCESSORIES**

<table>
<thead>
<tr>
<th>Electrical Connectors</th>
<th>Electrical Connector Form</th>
<th>Electrical Connector Type</th>
<th>Cord Length (meters / feet)</th>
<th>Cord Diameter</th>
<th>Electrical Connector Model Number</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>DIN 43650 Form A</td>
<td>Prewired Connector (18 gauge)</td>
<td>2 (6½)</td>
<td>6-mm</td>
<td>721K77, 720K77-W, 720K77-Z</td>
</tr>
<tr>
<td></td>
<td>DIN 43650 Form A</td>
<td>Prewired Connector (18 gauge)</td>
<td>2 (6½)</td>
<td>10-mm</td>
<td>371K77, 383K77-W, 383K77-Z</td>
</tr>
<tr>
<td></td>
<td>DIN 43650 Form A</td>
<td>Connector for threaded conduit (1/2 inch electrical conduit fittings)</td>
<td>–</td>
<td>–</td>
<td>723K77, 724K77-W, 724K77-Z</td>
</tr>
<tr>
<td></td>
<td>DIN 43650 Form A</td>
<td>Connector Only</td>
<td>–</td>
<td>–</td>
<td>937K87, 936K87-W, 936K87-Z</td>
</tr>
</tbody>
</table>

**CAUTIONS:** Do not use electrical connectors with surge suppressors, as this may increase valve response time when de-actuating the solenoids.

**VALVE OPERATION**

**Conditions at Start:**
Inlet 1 is closed to outlet 2 by both valve elements A and B. Outlet 2 is open to exhaust 3. Pressure signals at both switches SWA and SWB are exhausted. Contacts 1 and 2 of switches SWA and SWB are connected.

**Normal Operation:**
Simultaneously energizing both solenoids actuates both pilots and causes valve elements A and B to shift. Inlet 1 is then connected to outlet 2 via crossflow passages C and D. Exhaust 3 is closed. Sensing pressure signals go to each pressure switch and become equal to inlet pressure. Both switches trip and now contacts 1 and 4 of switches SWA and SWB are connected instead of contacts 1 and 2.

**Completion of Normal Cycle:**
Simultaneously de-energizing both solenoids returns the valve to the “Conditions at Start” described at left.

**Detecting a Malfunction:**
A malfunction in the system or the valve itself could cause one valve element to be open and the other closed. Air then flows past the inlet poppet on valve element A, into crossflow passage D, but is substantially blocked by the spool portion of element B. The large size of the open exhaust passage past element B keeps the pressure at the outlet port below 2% of inlet pressure. Full sensing air pressure from side A goes to switch SWA, and a reduced pressure goes to switch SWB. This full pressure signal causes switch SWA to trip. Switch SWB, with a reduced pressure signal, does not trip. An external monitoring system can detect the malfunction by monitoring the condition of the switches SWA and SWB. The external monitoring system may then react accordingly by shutting down the power to the valve solenoids and any other components deemed necessary to stop the machine.

**IMPORTANT NOTE:** Please read carefully and thoroughly all of the **CAUTIONS, WARNINGS** on the inside back cover.
General Information

Standard Specifications
The standard specifications for the products on each page of this catalog are given on the same page or referenced. For solenoid pilot valves, models with internal pilot supply are listed. Most models are also available for use with external pilot supply or have a built-in pilot supply selector valve.

The products in this catalog are intended for use in industrial pneumatic systems. Most products are adaptable to other uses and conditions not covered by the standard specifications given in this catalog. Weights shown are approximate and are subject to change. Dimensions given, unless otherwise noted, are envelope dimensions (not for mounting). Consult ROSS for further information.

Port Threads
Ports of valves and bases described in this catalog have NPT (ANSI B2.1) threads. Other thread types can be specified by putting an appropriate prefix letter on the model or part number when ordering.

### Thread Types by Model Prefix Letter

<table>
<thead>
<tr>
<th>Pneumatic Port Threads</th>
<th>Prefix Letter</th>
<th>Threaded Electrical Opening</th>
</tr>
</thead>
<tbody>
<tr>
<td>NPT (ANSI B2.1)</td>
<td>None</td>
<td>NPT</td>
</tr>
<tr>
<td>ISO 228 - DIN 259 Parallel, BSPP*</td>
<td>C*</td>
<td>—</td>
</tr>
<tr>
<td>ISO 228 - DIN 259 Parallel, BSPP#</td>
<td>D</td>
<td>G</td>
</tr>
<tr>
<td>ISO 228 - JIS B0203 Tapered#</td>
<td>J</td>
<td>ISO</td>
</tr>
<tr>
<td>SAE 1926- ISO 11926</td>
<td>S</td>
<td>NPT</td>
</tr>
</tbody>
</table>

* Used only for filters, regulators, lubricators.
# ISO 228 threads supersede BSPP, G and JIS thread types.

Flow Ratings
Flow ratings are expressed as C\textsubscript{v} where C\textsubscript{v} = 1 corresponds to a steady-state air flow of approximately 32 scfm under the following conditions:

- Inlet pressure = 100 psig (6.7 bar)
- Pressure drop = 10 psi (0.69 bar)
- Air temperature = 68°F (20°C)
- Relative humidity = 36 percent

**Note:** Because widely differing test standards are used to measure C\textsubscript{v} values, the figures given in this catalog should not be used to compare ROSS valves with those of other makers. The C\textsubscript{v} ratings given here are intended only for use with performance charts published by ROSS. The C\textsubscript{v} ratings are averages for the various flow paths through the valve and are for steady flow conditions.

Approvals and Certifications
ROSS products are designed to meet a number of industrial standards, including the Canadian Standards Association (C.S.A.) guidelines. For more information on specific product approvals, contact your local distributor or ROSS.

Solenoids
All ROSS standard solenoids are rated for continuous duty (unless noted otherwise) and will operate the valve within the air pressure range specified in this catalog.

Explosion-Proof Solenoid Pilot available, for more information consult ROSS.

Voltage & Hertz
When ordering a solenoid valve, also specify the desired solenoid voltage and hertz.

### Voltage Types by Model Suffix Letter

<table>
<thead>
<tr>
<th>Voltage</th>
<th>Suffix Letter</th>
</tr>
</thead>
<tbody>
<tr>
<td>120 volts AC</td>
<td>Z</td>
</tr>
<tr>
<td>220 volts AC</td>
<td>Y</td>
</tr>
<tr>
<td>12 volts DC</td>
<td>H</td>
</tr>
<tr>
<td>24 volts DC</td>
<td>W</td>
</tr>
<tr>
<td>48 volts DC</td>
<td>M</td>
</tr>
<tr>
<td>90 volts DC</td>
<td>K</td>
</tr>
<tr>
<td>110 volts DC</td>
<td>P</td>
</tr>
<tr>
<td>125 volts DC</td>
<td>C</td>
</tr>
</tbody>
</table>

**Recommended Solenoid Voltages:** 100-110 volts, 50 Hz; 100-120 volts, 60 Hz; 24 volts DC; 110 volts DC.

In addition, the following voltages are available:
- 200, 220 volts, 50 Hz
- 200, 240, 480 volts, 60 Hz
- 24, 48, 220 volts, 50 Hz
- 240 volts, 60 Hz
- 200, 220 volts, 50 Hz
- 200, 240 volts, 60 Hz.

**Please note that not all configurations are available for all models.**

For additional information or help with voltage configuration, please contact your local distributor or ROSS.

Port Identification
Valve symbols in this catalog conform to the ISO 1219-1:1991 standard of the International Organization for Standardization (ISO) and the SAE J2051 standard of the Society of Automotive Engineers (SAE) respectively.

Information or Technical Assistance
For additional information or application assistance concerning ROSS products, consult ROSS or your local ROSS distributor (see contact information on the back cover).

Order Placement

For order placement, consult ROSS or your local ROSS distributor.

For a current list of countries and local distributors, visit ROSS’ website at www.rosscontrols.com.
CAUTIONS, WARNINGS and STANDARD WARRANTY

PRE-INSTALLATION or SERVICE

1. Before servicing a valve or other pneumatic component, be sure that all sources of energy are turned off, the entire pneumatic system is shut off and exhausted, and all power sources are locked out (ref: OSHA 1910.147, EN 1037).

2. All ROSS products, including service kits and parts, should be installed and/or serviced only by persons having training and experience with pneumatic equipment. Because any installation can be tampered with or need servicing after installation, persons responsible for the safety of others or the care of equipment must check every installation on a regular basis and perform all necessary maintenance.

3. All applicable instructions should be read and complied with before using any fluid power system in order to prevent harm to persons or equipment. In addition, overhauled or serviced valves must be functionally tested prior to installation and use.

4. Each ROSS product should be used within its specification limits. In addition, use only ROSS parts to repair ROSS products.

WARNING: Failure to follow these directions can adversely affect the performance of the product or result in the potential for human injury or damage to property.

FILTRATION and LUBRICATION

5. Dirt, scale, moisture, etc. are present in virtually every air system. Although some valves are more tolerant of these contaminants than others, best performance will be realized if a filter is installed to clean the air supply, thus preventing contaminants from interfering with the proper performance of the equipment. ROSS recommends a filter with a 5-micron rating for normal applications.

6. All standard ROSS filters and lubricators with polycarbonate plastic bowls are designed for compressed air applications only. Do not fail to use the metal bowl guard, where provided, to minimize danger from high pressure fragmentation in the event of bowl failure. Do not expose these products to certain fluids, such as alcohol or liquefied petroleum gas, as they can cause bowls to rupture, creating a combustible condition, hazardous leakage, and the potential for human injury or damage to property. Immediately replace a crazed, cracked, or deteriorated bowl. When bowl gets dirty, replace it or wipe it with a clean dry cloth.

7. Only use lubricants which are compatible with materials used in the valves and other components in the system. Normally, compatible lubricants are petroleum based oils with oxidation inhibitors, an aniline point between 180°F (82°C) and 220°F (104°C), and an ISO 32, or lighter, viscosity. Avoid oils with phosphate type additives which can harm polyurethane components, potentially leading to valve failure which risks human injury, and/or damage to property.

AVOID INTAKE/EXHAUST RESTRICTION

8. Do not restrict the air flow in the supply line. To do so could reduce the pressure of the supply air below the minimum requirements for the valve and thereby cause erratic action.

9. Do not restrict a valve’s exhaust port as this can adversely affect its operation. Exhaust silencers must be resistant to clogging and must have flow capacities at least as great as the exhaust capacities of the valves. Contamination of the silencer can result in reduced flow and increased back pressure.

WARNING: ROSS expressly disclaims all warranties and responsibility for any unsatisfactory performance or injuries caused by the use of the wrong type, wrong size, or an inadequately maintained silencer installed with a ROSS product.

POWER PRESSES

10. Mechanical power presses and other potentially hazardous machinery using a pneumatically controlled clutch and brake mechanism must use a press control double valve with a monitoring device. A double valve without a self-contained monitoring device should be used only in conjunction with a control system which assures monitoring of the valve. All double valve installations involving hazardous applications should incorporate a monitoring system which inhibits further operation of the valve and machine in the event of a failure within the valve mechanism.

ENERGY ISOLATION/EMERGENCY STOP

11. Per specifications and regulations, ROSS L-O-X® and L-O-X® with EEZ-ON® operation products are defined as energy isolation devices, NOT AS EMERGENCY STOP DEVICES.

STANDARD WARRANTY

All products sold by ROSS CONTROLS are warranted for a one-year period [with the exception of all Filters, Regulators and Lubricators (“FRLs”) which are warranted for a period of seven years] from the date of purchase to be free of defects in material and workmanship. ROSS’ obligation under this warranty is limited to repair or replacement of the product or refund of the purchase price paid solely at the discretion of ROSS and provided such product is returned to ROSS freight prepaid and upon examination by ROSS is found to be defective. This warranty becomes void in the event that product has been subject to misuse, misapplication, improper maintenance, modification or tampering.

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