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DIGEST CATALOG 104

# ROSS CONTROLS
# FLUID POWER PRODUCTS FOR PNEUMATIC SOLUTIONS

• *Manufacturers of Premium Pneumatic Controls since 1921* •

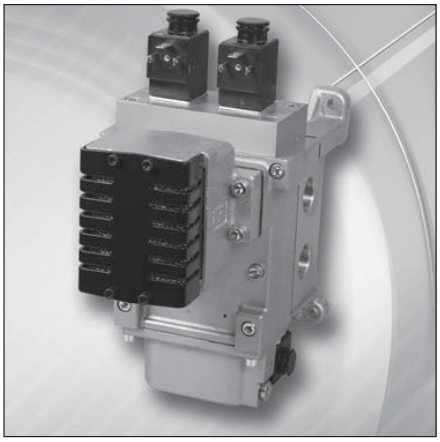
ROSS®
Consider it DONE!

# Contents



*This catalog represents an overview of ROSS' extensive product line. If you need products or specifications not shown within this catalog, please contact ROSS for more information or visit ROSS website at www.rosscontrols.com.*

# Revolutionizing Fluid Power



Chevrolet engine tappets, springs, and retainers were the ingredients that Charlie Ross used to make the first poppet valve after a fire destroyed Detroit Seamless Steel Tube Company in 1917. Charlie, a master mechanic, needed to resume production in a hurry and could not wait for shipments of replacement valves from Europe. Soon after, he filed his first patent and in 1921, Charlie Ross, StClair Cameron and four others incorporated the Ross Operating Valve Company.

Today, ROSS CONTROLS® proudly continues as a private company owned by the Cameron family and the ROSS spirit of ingenuity and appreciation for state-of-the-art designs still flows through its corporate culture. Our focus is to be a formidable competitor in key industries where technology offers ROSS® customers a distinct advantage.

ROSS customers are the experts in determining and communicating their fluid power product requirements. Instead of inventing “push” products that ROSS thinks its customers want, ROSS listens to our customers as they “pull” ROSS into new fluid power applications.
With our unique customer-driven ROSS/FLEX® development process, ROSS is revolutionizing the fluid power industry.

ROSS CONTROLS® is an international company. Our design process of making unique and tailored products is in demand around the globe. ROSS is ISO 9000 certified and has facilities and/or sales offices in the United States, Germany, Japan, the United Kingdom, India, Brazil, France and China, augmented by 145 stocking distributors worldwide to serve customers locally.

Visit the ROSS website at www.rosscontrols.com to fully explore premium pneumatic controls systems, services, and distributor channels. ROSS is dedicated to developing matchless pneumatic system solutions to improve the efficiency and effectiveness of customers’ equipment and operations. With outstanding design, sales, service, and highly trained worldwide distributor network, ROSS has a GLOBAL Reach with a LOCAL Touch ready to provide customers with its very best anywhere. ROSS is ready to serve YOU!

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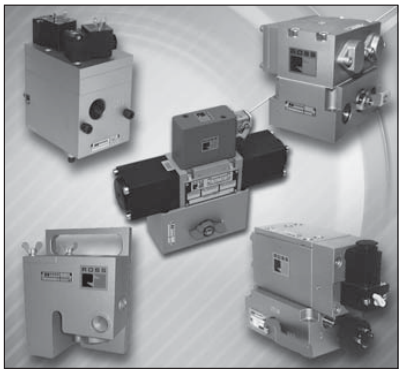
# Industry Solutions

Visit the ROSS web site at www.rosscontrols.com to fully explore the premium pneumatic and electronic controls systems, services, and distributor channels. ROSS is dedicated to developing matchless pneumatic, electronic, and/or hydraulic system industry solutions to improve the safety and effectiveness of customers' equipment and operations.

## Hollow Glass Machines

- Valves designed for repeatability
- Counterblow vacuum valves
- Hi/low pressure valves
- Plunger up/down & cooling valves
- Blowhead on/off valve including kickoff
- Mold open/close valves
- Pusher valves
- Blow mold vacuum valves
- Final blow Slimline™ valves with quick exhaust or pressure booster options
- All designed for high temperature service
- Blow pistol valve
- Proportional valves for plunger and blowing applications
- Unbeatable poppet technology for high shift consistency
- Systems, circuits & products which substantially reduce piping, fittings, maintenance, downtime, labor cost, & compressed air usage

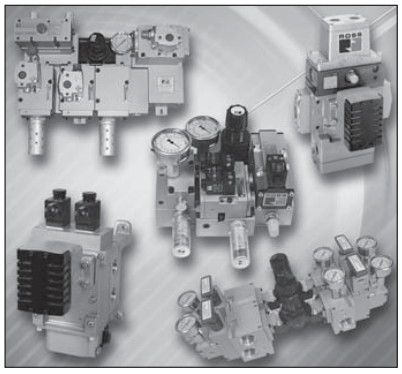
For details, visit the Hollow Glass Industry page at www.rosscontrols.com.



## Metal Forming Products

- Pneumatic double valves for clutch/brake control
- 4-way double valves for clamp cylinder control
- Soft Clutch and Soft Brake modules
- Modular Press Solutions
- Custom Pneumatic manifolds
- Air distribution manifolds
- Automation valve manifolds
- Die Cushion manifolds
- Lockout valve manifolds
- Main Air filter and lockout devices
- Efficiently designed systems to eliminate piping connections, ease installation, reduce procurement costs, simplify troubleshooting, save energy, reduce downtime, improve appearance and consolidate space

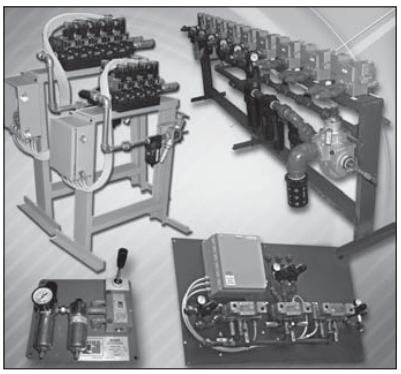
For details, visit the Metalforming Industry page at www.rosscontrols.com.



## Steel Industry & Primary Metals Processing Products

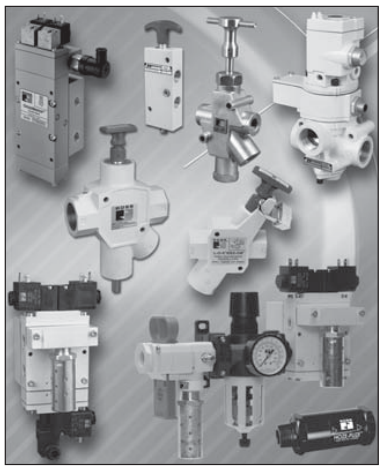
- Valve stands, panels & enclosures
- High flow, dirt tolerant valve accessories
- High flow FRL's
- Proportional pressure controls for tension rolls
- 1/8"-3" NPT, metric & SAE threads
- Rugged construction
- Complete integrated systems
- Entry & exit systems on mills & process lines
- Water valve control for cooling & descaling
- High speed valves for brake control
- Control of inert gases to approximately 10 Bar
- High flow, dirt tolerant base mounted & in-line poppet valves

For details, visit the Steel Industry page at www.rosscontrols.com.



# Industry Solutions

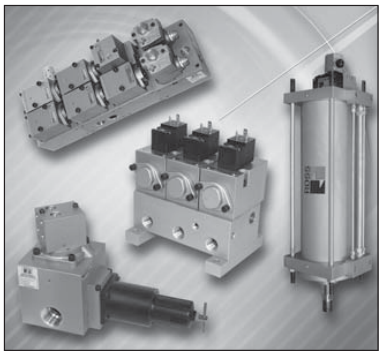
## Safety Products



- Control-reliable 3/2 and 5/2 pneumatic valves with BG Certification
- Pneumatic internally monitored double valves for safety applications,
- Control Reliable Double Valves
- Manual and solenoid L-O-X® valves for energy isolation
- EEZ-ON® valves for gradual start-up
- Manual L-O-X® valves with EEZ-ON® operation
- Modular L-O-X® air entry combination
- Stainless Steel L-O-X® valves for energy isolation
- Sensing Valves Category 2 Monitored in-line valves
- Pilot operated check valves (single/double channel sensing available)
- Check valves
- HOZE-FUZE® to prevent hose whip
- Silencers & reclassifiers
- Lockout verification accessories

For details, visit the Safety Industry page at www.rosscontrols.com.

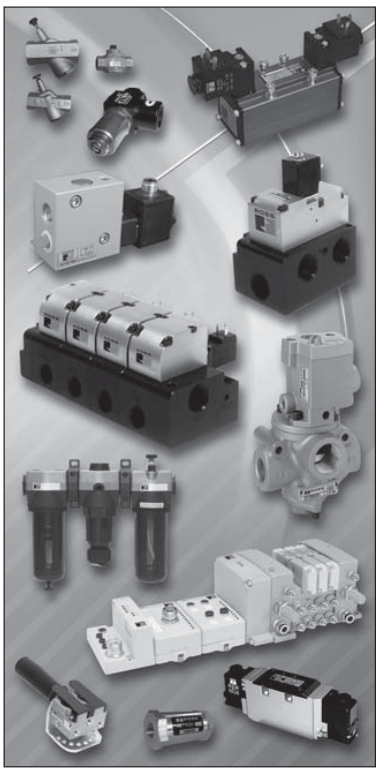
## Aluminum Reduction



- Smelter-Duty Valves and Cylinders
- ENERGYSAVER® Crustbreaker Valves, Cylinders and Systems
- Point Feed, Ore Feed and Bar Break System Solutions
- Door opening
- Overhead crane
- Pot Tapping
- Anode Forming
- Casthouse
- Pneumatic Conveying
- PTM (Pot Tending Machine) Controls
- Safety Systems

For details, visit the Aluminum Industry page at www.rosscontrols.com.

## General Automation Products



- Line-mounted valves
- ISO, ANSI, SAE base mounted valves
- ENERGYSAVER® valves
- Flow control valves
- Check valves
- Pendant control valves
- Manual L-O-X® valves
- EEZ-ON® valves
- Filters, regulators and lubricators
- High-flow reverse flow regulators
- High capacity water & particulate filters
- Silencers
- Mechanical valves
- Pilot operated valves
- Pilot operated check valves
- Dale Series poppet, manifold and leak tight valves
- Serial BUS systems
- Pneumatic relief valves
- Vacuum valves
- Right angle pilot operated checks, EEZ-ON® valves, & regulators
- Foot & hand valves

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# ROSS/FLEX® Process For Innovative Solutions

## ROSS/FLEX® Is Not a Product Line.

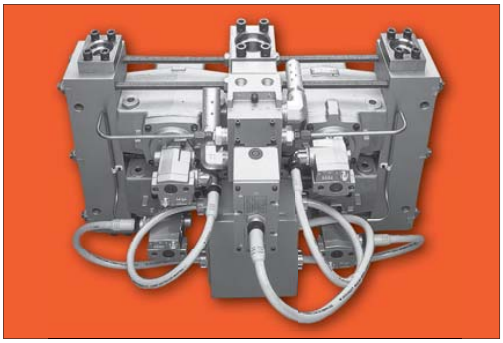
The ROSS/FLEX® process is a manufacturing culture. Its goal is to help you reduce costs while increasing the practical value of your air controls and pneumatic systems. It puts the power back where it belongs: In the hands of the customer!

As a customer, we believe you have every right to receive a product that is precisely suited to your needs - both functional and financial.

If you're building a machine that requires six different air controls, and the design could be improved by having a single, six-function control – then that's what you should have.

That is why we created the ROSS/FLEX® service.

*It's an innovative and economical process of involving the customer in the design of pneumatic controls for their application.*



## A creative resource for total system solutions.

ROSS brings you into the process, to produce better solutions for your pneumatic applications. ROSS/FLEX® supports your goals and specifications with a specially-trained and equipped design engineering team and a fully-automated manufacturing system that is truly "state-of-me-art." The net result is a unique system solution, manufactured to your requirements and developed in days, rather than weeks or months. It's a special approach, involving some very unique capabilities which are available today, only at ROSS.

**The underlying concept Is simple.** Using a custom-designed product is better than force-fitting run-of-the-mill products to your application.

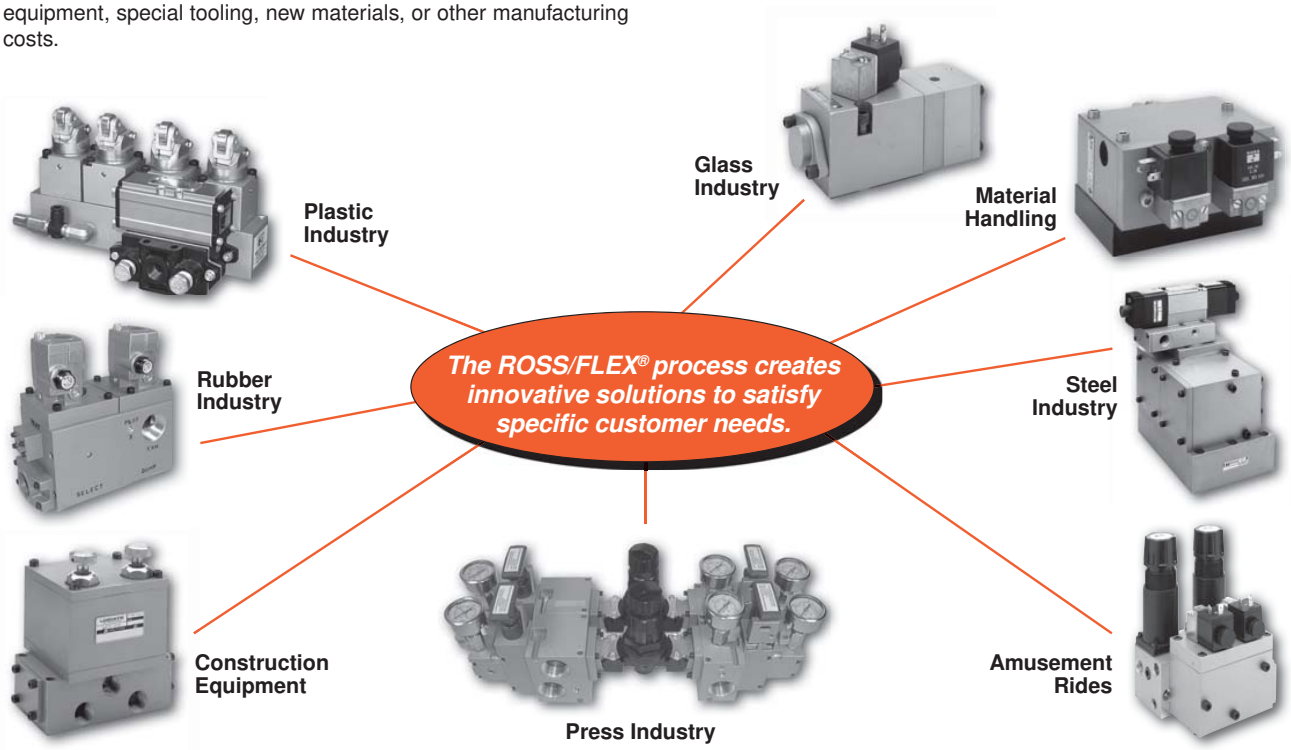
**The cost.** It used to involve an army of engineers, designers, production planners, machinists, and others. It often meant new equipment, special tooling, new materials, or other manufacturing costs.

ROSS/FLEX® technology eliminates those costs and dramatically reduces the time required to develop a solution. Designing, prototyping, testing, revising, prototyping, testing – It all took time, and the sequence could continue through endless repetitions.

The ROSS/FLEX® service can design and deliver a working prototype, often in as little as 72 hours. Revisions are even faster.

And there are no worries about being tied to one supplier for integration with all your other units or provision of service or parts?

The ROSS/FLEX® service can design and manufacture for compatibility with any brand. In addition, all the working components are proven ROSS parts – available worldwide from ROSS and its distributors.



# ROSS Integrated Systems

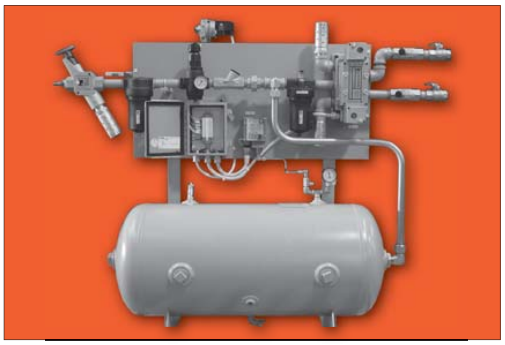
ROSS offers custom design, manufacturing and support of complete valve systems.

**Services Provided:**

- Systems Engineering
- Controls Engineering
- Custom Fabrication
- Installation Assistance
- Integrated ROSS Components into a Engineered System Solution

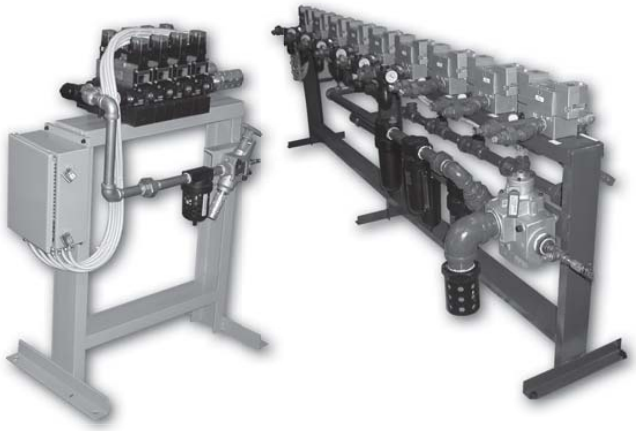
ROSS offers engineering and construction of Valve Stands, Wall Mounted Plates or Enclosed System Panels to allow quick and easy installation at the job site.

*ROSS – Providing more than just components.*



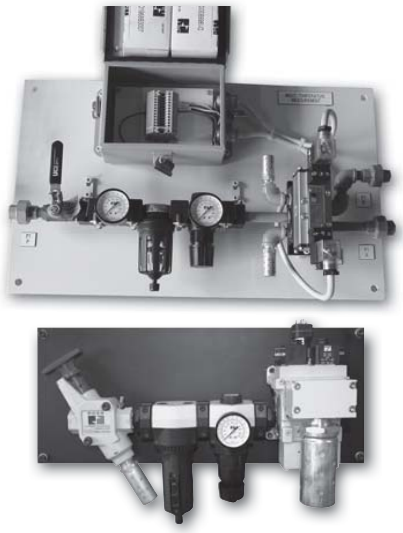
## Valve Stands

Free standing valve stands provides a flexible way to isolate and position a group of valves near the tooling.



## Wall or Plate Mounted Systems

Connect the unit to the tooling then pipe in the air supply and discharge lines.

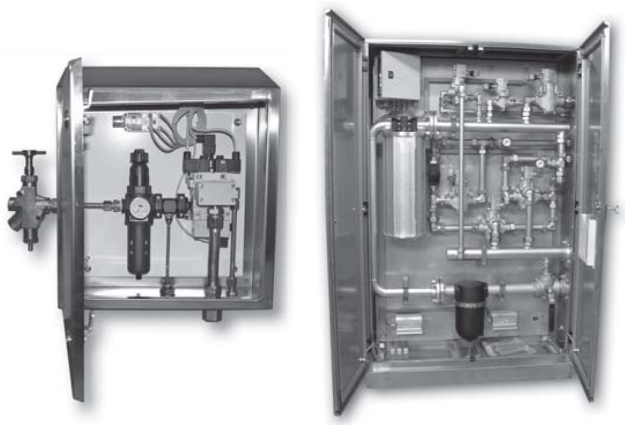


## Enclosed System Panels (Cabinets)

ROSS provides custom systems with enclosed panels for harsh or hazardous conditions. Enclosed-panel designs help protect system components by eliminating the risk of contamination from the surrounding environment.

**Features and Benefits:**

- Available with locking cabinets for restricted access
- Customized with a wide range equipment to meet the needs of an “Any” application
- Customized in a variety of shapes and sizes, based on surroundings and space availability



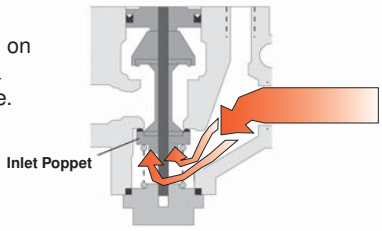
***ROSS can offer the right configuration for your specific needs.***

# The ROSS Poppet Valve . . . A ROSS Speciality from the Beginning

## Positive Sealing

Inlet air pressure forces the inlet poppet upward, pushing the poppet seal firmly against the seat. The higher the inlet pressure, the greater the sealing force. Note that the seal is engaged perpendicular to the seat; there is no sliding action to damage and wear the seal, or to cause erratic friction.

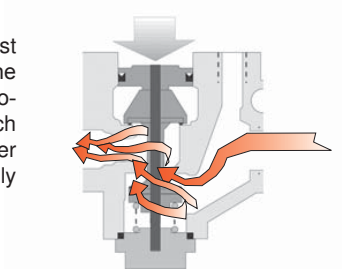
Pilot air pressure, working on a large piston, produces a very strong actuating force.




## Self-Cleaning and Dirt Tolerant

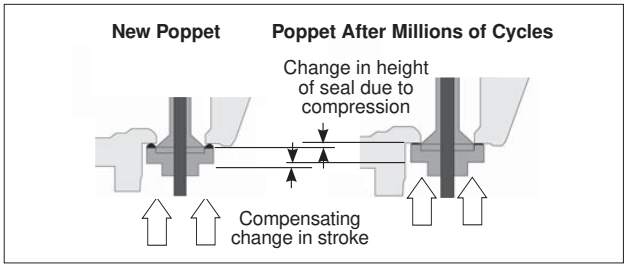
The flow velocity for a given volume of air is dependent upon the area through which it is flowing. The smaller the area, the greater the velocity.

In poppet valves, the smallest flow-through area is across the poppet's seal and seat. This produces a very high velocity which blows all dirt and foreign matter out of the seat area for a virtually leak-proof seal.



## Self-Compensating for Wear

Because of its superior design, any change in the height of the valve seal (due to compression) is automatically compensated for by an equal change in the length of stroke.



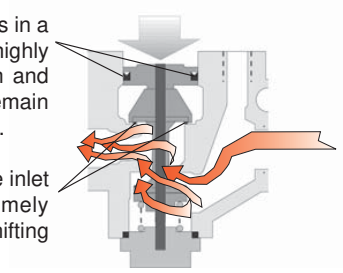

## Repeatability Over the Life of the Valve

High velocity air flow begins at the instant when the inlet poppet moves off the seat; flow enhances actuation right from the start.

Pilot air pressure, working on a large piston, produces a very strong actuating force.

There is minimal sliding of seals in a poppet valve (sliding seals are highly prone to varnish). The friction and therefore, the repeatability, remain consistent for millions of cycles.

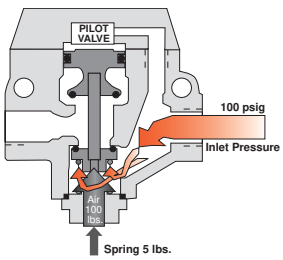
When pilot air is exhausted, the inlet pressure produces an extremely strong upward force, reliably shifting the valve to a closed position.



## Why Do ROSS Poppet Valves Pop?

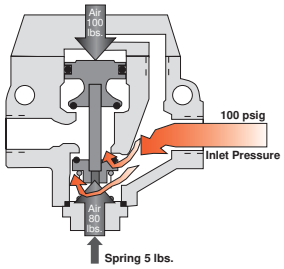
ROSS poppet valves pop open and closed almost instantly. Surface areas of the piston poppet, the exhaust poppet and the inlet poppet are carefully calculated to produce strong shifting and sealing forces in each direction. This results in a design which ensures high speed, repeatability and high shifting forces.

### 1 - Valve Not Actuated



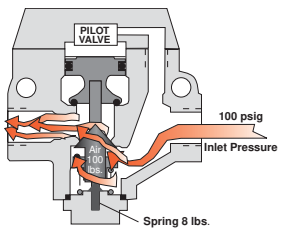

**Net Upward Force: 85 lbs.** This force keeps the inlet poppet well sealed.

### 2 - Actuating Signal Applied



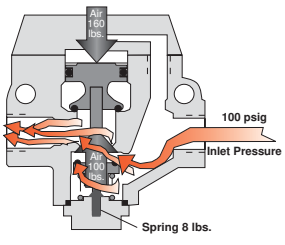

**Net Downward Force: 75 lbs.** This force moves the valve element downward once pilot pressure is on the piston poppet. When the inlet poppet opens, the full force of 160 lb on the piston poppet moves the valve element downward.

### 3 - Valve Actuated




**Net Downward Force: 52 lbs.** This force seals the exhaust poppet and holds the valve element open.

### 4 - De-actuating Signal Removed

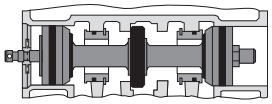



**Net Upward Force: 108 lbs.** This force initiates the return of the valve element to the closed position. When the valve closes, the cycle is complete and the valve is again in position 1 (see illustration, 1- Valve Not Actuated).

# Choose the Type of Base Mounted Valve Construction that Best Meets Your Needs

## Poppet- ISO W64, ANSI W74, SAE 84 Series

Poppet surfaces face-seal against flat poppet seats.



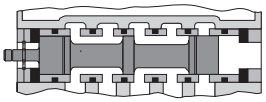
**FEATURES**
- Large pilot pistons
- Mechanical detents
- Self-cleaning
- Short stroke
- Fluorocarbon seal option available
- Wear-compensating design

**BENEFITS**
- Very dependable
- Tolerant of dirty air
- Positive seating
- Fast response
- Long service life
- Low maintenance
- Repeatability

**APPLICATIONS**
- Where there is no lubricated air
- Where the air is dirty (steel mills, glass plants, foundries, and aluminum smelters)
- High-speed machines
- High-temperature environments

## Stainless Steel Spool & Sleeve- ISO W60, W65, ANSI W70, SAE 80 Series

Stainless steel spools move on an extremely thin film of air in the micro-inch clearance between spool and sleeve.



**FEATURES**
- Low shifting forces
- No wearing contact
- Balanced spool
- Mechanical detents
- Full 5-port design
- 2 or 3-position types
- No dynamic seals

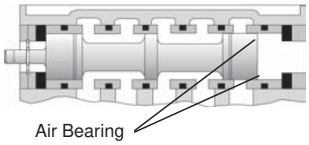
**BENEFITS**
- Extremely long service life
- High cycle rates
- Fast response
- Use as 2-, 3-, 4-, or 5-way selector valve
- No seals to wear out
- Very low maintenance

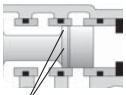
**APPLICATIONS**
- On high-speed machines
- In food processing
- In dual-pressure circuits
- As little as 15 psi (1 bar) shifts spool

# The ROSS Stainless Steel Spool & Sleeve Valve . . . Better, by Design!

## Balanced Design

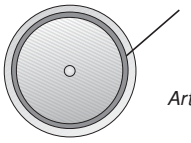
A balanced design means that the force required to shift the valve does not change when the inlet pressure changes. Inlet pressure or back pressure may be applied to one or more ports without affecting this shifting force.




## Low-friction Spool

The spool is separated from, and actually floating within, the sleeve. A thin film of air creates an air bearing which virtually eliminates sliding friction between the spool and sleeve during shifting.

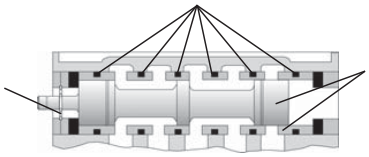



*Artist's rendering depicts an end view of the spool, to show how the air bearing minimizes wear.*

## Other Significant Features

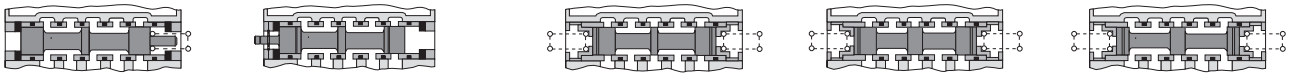
A mechanical detent is built into all ROSS 2-position spools to ensure that they maintain position.

O-rings isolate the precision steel sleeve from valve body and mounting torque distortions. O-rings are static and are not subject to dynamic wear.



The stainless steel spool and sleeve are matched and selectively assembled to maintain a clearance of 1 to 2 ten-thousandths of an inch over the diameter. The stainless steel components are also immune to most chemicals.

**Spool valve construction can be made in 2 and 3 position functions.**



**Single Control (2 position)** | **Double Momentary [Impulse] Control (2 position)** | **Power Center, Double Control (3 position)** | **Closed Center, Double Control (3 position)** | **Open Center, Double Control (3 position)**

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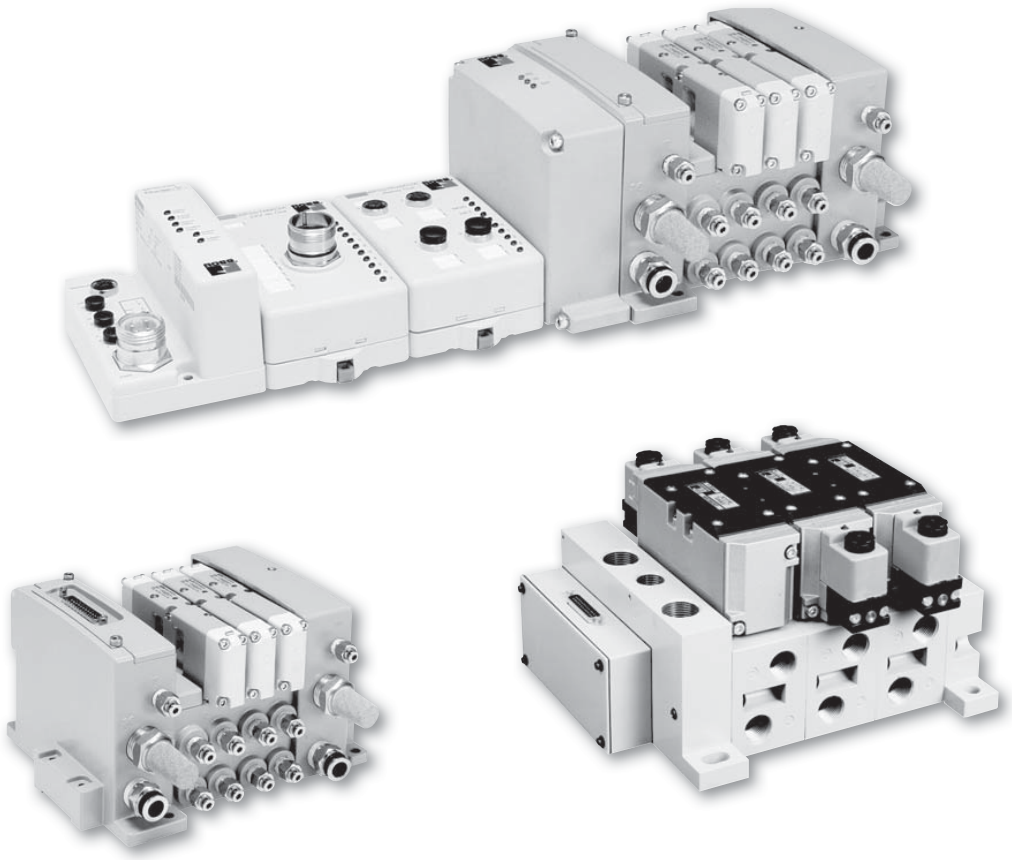
# ISO Valves and Serial Bus Communication from ROSS CONTROLS

**For more information please refer to**

## BULLETIN 600



Please visit the ROSS web site to view the complete Bulletin 600 (Form #A10309) at www.rosscontrols.com.

# ISO Size 00 & 0 Valves

## 15407-1 & 2

### Specifications

Size 00, Series W66: 0.55 Cv (18 mm)
Size 0, Series W66: 1.1 Cv (26 mm)

### Materials of Construction

- End Caps: PBT
- Fasteners: Zinc Plated Steel
- Valve Body: Aluminum
- Coils: Thermoset Plastic

### Operating Pressure

- Vacuum to 145 PSIG
- Minimum Operating Pressure
  – 2-Position: 25 PSI
  – 3-Position: 35 PSI

### Ports

- NPT and BSPP “G” Standard

### Manifolds

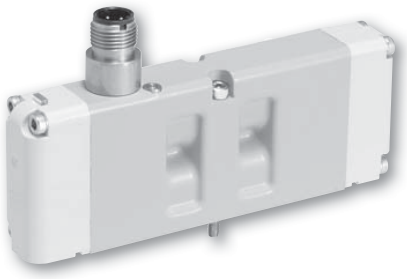
- Terminal Block Wiring (Series W66, Size 0 Only)
- Collective Wiring
  – 25-Pin, D-Sub
  – 19-Pin Round
  – 16 Point Terminal Strip
  – M23, 12-Pin
  – Serial Bus Field Bus

### Certification / Approval

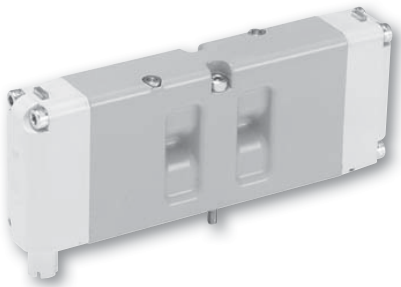
- Approved to be CE Marked
- CSA / C-US Approved
- NEMA 4
- IP65
- Manifold and Subbase Ports
  Meet ISO 1179 Specifications

### Solenoids

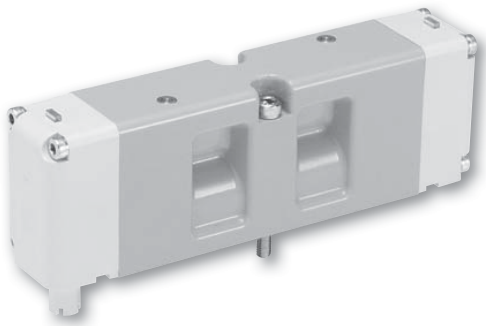
- Surge Suppression (Standard)
- Low Watt – 1.0, 24 volts DC, 2.0 VA, 120 volts AC
- Indicator Lights



**Size 00 (18 mm), Single Solenoid (5/2)**
**Series W66 (15407-1)**



**Size 00 (18 mm), Double Solenoid (5/2)**
**Series W66 (15407-2)**



**Size 0 (26 mm), Double Solenoid (5/3)**
**Open Center**
**Series W66 (15407-2)**

Please visit the ROSS web site to view the complete Bulletin 600 (Form #A10309)
at www.rosscontrols.com.

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

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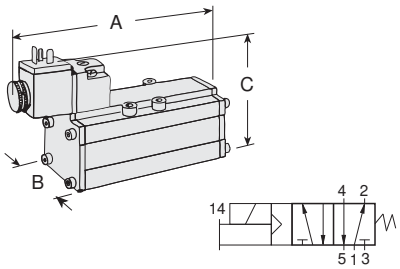
# Spool & Sleeve Valves for ISO Sub-Bases (5599/I) Series W60

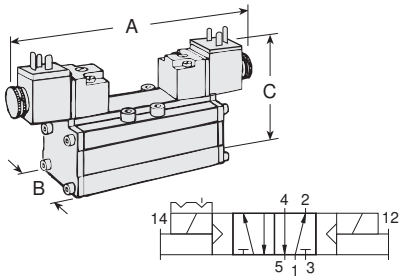
## 5/2 Valves – Single Solenoid Pilot Controlled, Spring Return




| ISO Size | Range of Port Sizes | Valve Model Number* | Avg. $C_v$ | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|
| 1 | 1/8 - 3/8 | W6076B2401 | 0.8 | 5.41 (137.5) | 1.64 (41.7) | 3.25 (82.6) | 1.5 (0.7) |
| 2 | 3/8 - 1/2 | W6076B3401 | 1.9 | 6.24 (158.5) | 2.10 (53.4) | 3.55 (90.2) | 2.3 (1.1) |
| 3 | 1/2 - 3/4 | W6076B4401 | 3.8 | 6.21 (157.8) | 2.55 (64.8) | 3.73 (94.8) | 3.5 (1.6) |

* Sub-base and electrical connector not included.
See pages 17-18 for sub-bases, manifolds and accessories.

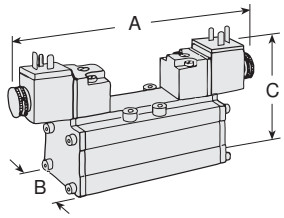
## 5/2 Valves – Double Solenoid Pilot Controlled, Detented

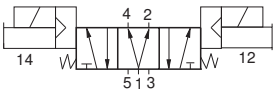



| ISO Size | Range of Port Sizes | Valve Model Number* | Avg. $C_v$ | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|
| 1 | 1/8 - 3/8 | W6076B2407 | 0.8 | 6.59 (167.4) | 1.64 (41.7) | 3.25 (82.6) | 1.8 (0.9) |
| 2 | 3/8 - 1/2 | W6076B3407 | 1.9 | 7.39 (187.7) | 2.10 (53.4) | 3.55 (90.2) | 2.7 (1.2) |
| 3 | 1/2 - 3/4 | W6076E4407 | 3.8 | 6.62 (168.2) | 2.55 (64.8) | 3.73 (94.8) | 3.9 (1.8) |

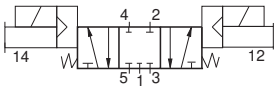
* Sub-base and electrical connector not included.
See pages 17-18 for sub-bases, manifolds and accessories.

## 5/3 Valves – Double Solenoid Pilot Controlled

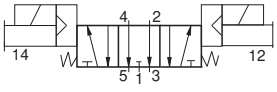


Power Center



Closed Center



Open Center

| ISO Size | Range of Port Sizes | Valve Model Number* Power Center | Closed Center | Open Center | Avg. $C_v$ | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 1/8 - 3/8 | W6077A2951 | W6077B2401 | W6077B2407 | 0.8 | 6.67 (169.5) | 1.64 (41.7) | 3.25 (82.6) | 1.8 (0.9) |
| 2 | 3/8 - 1/2 | W6077A3945 | W6077B3401 | W6077B3407 | 1.9 | 7.59 (192.8) | 2.10 (53.4) | 3.55 (90.2) | 2.8 (1.3) |
| 3 | 1/2 - 3/4 | W6077B4934 | W6077B4401 | W6077B4407 | 3.8 | 6.65 (169.0) | 2.55 (64.8) | 3.73 (94.8) | 4.0 (1.8) |

* Sub-base and electrical connector not included.
See pages 17-18 for sub-bases, manifolds and accessories.

**Electrical connection conforming to ANSI standard B93.55M is available. For more information, refer to ROSS Bulletin 379B (form number A10090).**

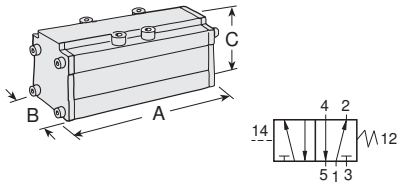
**STANDARD SPECIFICATIONS** (for valves on this page)**:**
**Solenoids: AC or DC power.**
**Standard Voltages:** See page 108; consult ROSS.
**Power Consumption:** Each solenoid; 11 VA inrush, 8.5 VA holding on 50 or 60 Hz; 6 watts on DC.
**Ambient Temperature:** 40° to 120°F (4° to 50°C).
**Media Temperature:** 40° to 175°F (4° to 80°C).

**Flow Media:** Filtered air; 5 micron recommended.
**Inlet Pressure:** Vacuum to 150 psig (10 bar).
**Pilot Pressure:** *Size 1 models:* At least 30 psig (2 bar).
*Size 2 & 3 models:* At least 15 psig (1 bar).
**Internal/External Supply:** Selected automatically.
**Manual Override:** Flush, non-locking.

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

# Spool & Sleeve Valves for ISO Sub-Bases (5599/I) Series W60

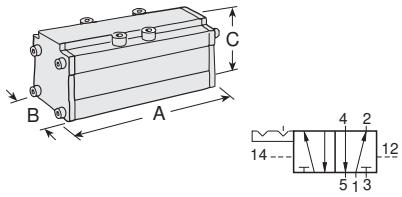
## 5/2 Valves – Single Pressure Controlled, Spring Return




| ISO Size | Range of Port Sizes | Valve Model Number* | Avg. $C_v$ | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|
| 1 | 1/8 - 3/8 | W6056B2411 | 0.8 | 4.1(105) | 1.7 (42) | 1.8 (47) | 0.8 (0.4) |
| 2 | 3/8 - 1/2 | W6056B3411 | 1.9 | 5.0 (126) | 2.1 (54) | 2.1 (54) | 1.5 (0.7) |
| 3 | 1/2 - 3/4 | W6056B4411 | 3.8 | 6.0 (152) | 2.6 (65) | 2.6 (65) | 3.0 (1.4) |

* Sub-base not included. See pages 17-18 for sub-bases, manifolds and accessories.

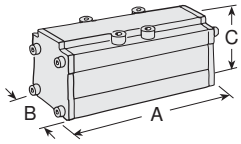
## 5/2 Valves – Double Pressure Controlled, Detented

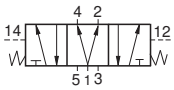



| ISO Size | Range of Port Sizes | Valve Model Number* | Avg. $C_v$ | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|
| 1 | 1/8 - 3/8 | W6056B2417 | 0.8 | 4.1(105) | 1.7 (42) | 1.8 (47) | 0.8 (0.4) |
| 2 | 3/8 - 1/2 | W6056B3417 | 1.9 | 5.0 (126) | 2.1 (54) | 2.1 (54) | 1.5 (0.7) |
| 3 | 1/2 - 3/4 | W6056E4417 | 3.8 | 6.0 (152) | 2.6 (65) | 2.6 (65) | 3.0 (1.4) |

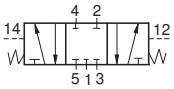
* Sub-base not included. See pages 17-18 for sub-bases, manifolds and accessories.

## 5/3 Valves – Double Pressure Controlled

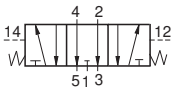


Power Center



Closed Center



Open Center

| ISO Size | Range of Port Sizes | Valve Model Number* Power Center | Closed Center | Open Center | Avg. $C_v$ | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 1/8 - 3/8 | W6057A2934 | W6057B2411 | W6057B2417 | 0.8 | 4.2 (107) | 1.7 (42) | 1.8 (47) | 1.0 (0.5) |
| 2 | 3/8 - 1/2 | W6057A3933 | W6057B3411 | W6057B3417 | 1.9 | 5.4 (135) | 2.1 (54) | 2.1 (54) | 1.5 (0.7) |
| 3 | 1/2 - 3/4 | W6057A4937 | W6057B4411 | W6057B4417 | 3.8 | 6.2 (158) | 2.6 (65) | 2.6 (65) | 3.0 (1.4) |

* Sub-base not included. See pages 17-18 for sub-bases, manifolds and accessories.

**STANDARD SPECIFICATIONS** (for valves on this page)**:**
**Ambient/Media Temperature:** 40° to 175°F (4° to 80°C).
**Flow Media:** Filtered air; 5 micron recommended.

**Inlet Pressure:** Vacuum to 150 psig (10 bar).
**Pilot Pressure:** *Size 1 models:* At least 30 psig (2 bar).
*Size 2 & 3 models:* At least 15 psig (1 bar).

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

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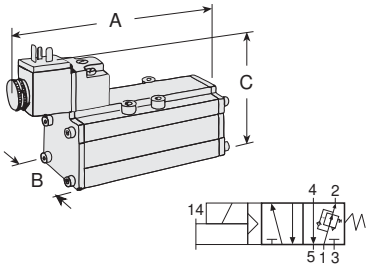
# ENERGYSAVER® Valves for ISO Sub-Bases (5599/I) Series W60

Traditionally, standard valves apply the same pressure for extending and retracting double acting cylinders. However, this new ENERGYSAVER® valve revolutionizes the way cylinders are controlled, by reducing the cylinder retract pressure.


***Reduces compressed air consumption up to 30%.***

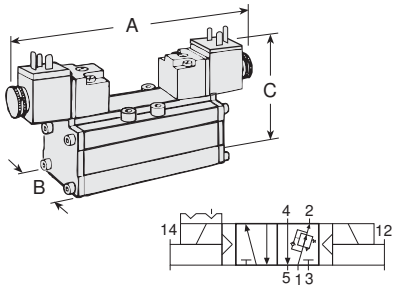
## 5/2 Valves – Single Solenoid Pilot Controlled, Spring Return




| ISO Size | Range of Port Sizes | Valve Model Number* | Avg. $C_v$ | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|
| 1 | 1/8 - 3/8 | W6076A2957 | 0.8 | 5.41 (137.5) | 1.64 (41.7) | 3.25 (82.6) | 1.5 (0.7) |
| 2 | 3/8 - 1/2 | W6076A3957 | 1.9 | 6.24 (158.5) | 2.10 (53.4) | 3.55 (90.2) | 2.3 (1.1) |
| 3 | 1/2 - 3/4 | W6076A4957 | 3.8 | 6.21 (157.8) | 2.55 (64.8) | 3.73 (94.8) | 3.5 (1.6) |

* Sub-base and electrical connector not included.
See pages 17-18 for sub-bases, manifolds and accessories.

## 5/2 Valves – Double Solenoid Pilot Controlled, Detented




| ISO Size | Range of Port Sizes | Valve Model Number* | Avg. $C_v$ | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|
| 1 | 1/8 - 3/8 | W6076A2961 | 0.8 | 6.59 (167.4) | 1.64 (41.7) | 3.25 (82.6) | 1.79 (0.9) |
| 2 | 3/8 - 1/2 | W6076A3961 | 1.9 | 7.39 (187.7) | 2.10 (53.4) | 3.55 (90.2) | 2.7 (1.2) |
| 3 | 1/2 - 3/4 | W6076A4961 | 3.8 | 6.62 (168.2) | 2.55 (64.8) | 3.73 (94.8) | 3.9 (1.8) |

* Sub-base and electrical connector not included.
See pages 17-18 for sub-bases, manifolds and accessories.

**Electrical connection conforming to ANSI standard B93.55M is available. For more information, refer to ROSS Bulletin 379B (form number A10090).**

**STANDARD SPECIFICATIONS** (for valves on this page)**:**
**Solenoids:** AC or DC power.
**Standard Voltages:** 100-110 volts, 60 Hz; 200-240 volts, 50/60 Hz; 24 volts DC; 110 volts DC. For other voltages, consult ROSS.
**Power Consumption:**
Each solenoid: 8.5 VA inrush, 6 VA holding on 50 or 60 HZ; 6 watts on DC.

**Ambient Temperature:** 40° to 120°F (4° to 50°C).
**Media Temperature:** 40° to 175°F (4° to 80°C).
**Flow Media:** Filtered air; 5 micron recommended.
**Inlet Pressure:** 60 to 120 psig (4 to 8 bar).
**Manual Override:** Flush, non-locking.

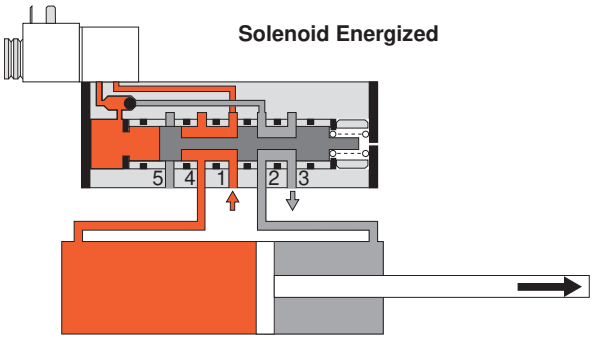
**IMPORTANT NOTE:** Please read carefully and thoroughly all of the **CAUTIONS** on the inside back cover.

# EnergySaver® Valves for ISO Sub-Bases (5599/I) Series W60

The Series W60 EnergySaver® valve is a 5-port, 2-position, sub-base mounted valve that supplies full line pressure to port 4 and reduced pressure (30 psig - 2 bar) to port 2. This provides full cylinder force to move the load, but returns the cylinder with less pressure thus reducing your compressed air consumption by up to 30%. Although reduced, the pressure in port 2 is enough for quick return of the cylinder. The energy saving function is accomplished by action of the spool and works as quickly as a pressure regulator.

## Overview of Valve Function

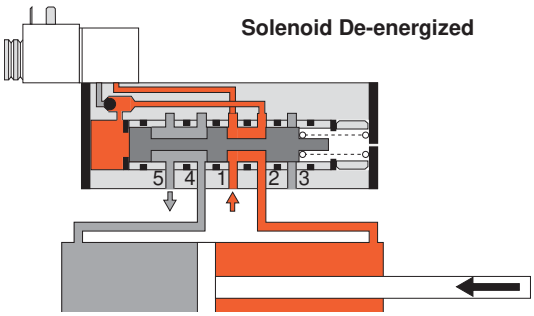
**Solenoid Energized**




***NOTE:*** *The example of "How it Works" is specific to the single solenoid EnergySaver® valve. The double solenoid models operate similarly, but as a double solenoid type valve. If you have specific questions about the operation of the double or single solenoid EnergySaver® valves, please contact ROSS for more information.*

When the solenoid is energized, the EnergySaver® valve operates as a standard valve. Supply pressure is directed from the inlet port to port 4 extending the cylinder at full pressure and force. Air in the rod end of the cylinder is exhausted via port 3.

**Solenoid De-energized**

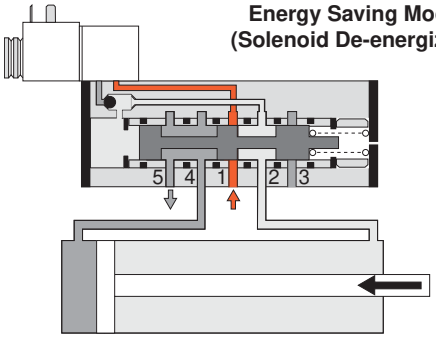



Upon de-energizing the solenoid, the pilot valve starts to exhaust the pilot signal from the end of the spool. Momentarily, the spool shifts back to a "normal" de-energized position directing inlet air to flow to the rod end of the cylinder (port 2 of the valve) and exhausting the cap end.

The shuttle now has higher pressure on the opposite side causing it to shift. Shifting the shuttle closes the connection from the spool to the pilot exhaust and opens the cavity at the end of the spool to feedback pressure from port 2.

Meanwhile the cylinder has begun to retract.

**Energy Saving Mode (Solenoid De-energized)**




Because the actuating end of the spool now has high pressure applied, the spool starts to shift to the right again closing off the inlet port. Closing the inlet prohibits the air supply from maintaining pressure on the rod end of the cylinder and as the cylinder continues to retract, the pressure drops.

This pressure drop reduces the amount of force available to keep the spool actuated against the valve return spring. So, the spool starts to shift back thus allowing an influx of pressure to help retract the cylinder.

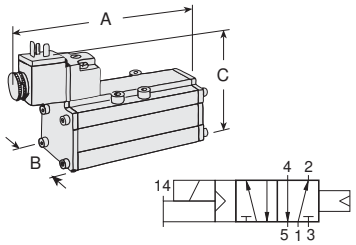
The EnergySaver® valve operates as a fixed spring regulator when in the energy saving mode, maintaining the cylinder return pressure at approximately 30 psig (2 bar). Retracting and holding the cylinder with only 2 bar pressure consumes much less air than the standard method of using full pressure to shift and retract.

| | |
|---|---|
| **APPLICATION WARNING:** | When inlet pressure is 60 psig (4 bar) or less, the double and single solenoid EnergySaver® valves will pressurize port 2 and exhaust port 4, regardless of applied solenoid signals. This feature, which occurs when inlet pressure is below 60 psig (4 bar), must be taken into consideration in your application design in order to avoid the potential for personal injury or property damage. |

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

# Poppet Valves for ISO Sub-Bases (5599/I) Series W64

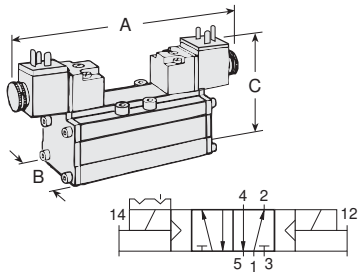
## 5/2 Valves – Single Solenoid Pilot Controlled, Air Return




| ISO Size | Range of Port Sizes | Valve Model Number* Std. Temp. | High Temp. | Avg. $C_v$ | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|---|
| 1 | 1/8 - 3/8 | W6476B2401 | W6476B2402 | 1.0 | 5.4 (137) | 1.7 (42) | 3.2 (82) | 1.3 (0.6) |
| 2 | 3/8 - 1/2 | W6476B3401 | W6476B3402 | 2.0 | 6.3 (153) | 2.1 (54) | 3.5 (90) | 1.8 (0.8) |
| 3 | 1/2 - 3/4 | W6476B4401 | W6476B4402 | 4.0 | 6.6 (168) | 2.6 (65) | 3.7 (94) | 2.8 (1.3) |

* Sub-base and electrical connector not included.
See pages 17-18 for sub-bases, manifolds and accessories.

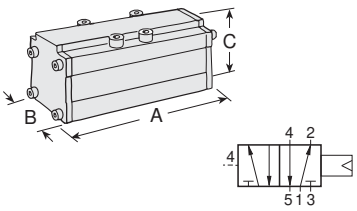
## 5/2 Valves – Double Solenoid Pilot Controlled, Detented




| ISO Size | Range of Port Sizes | Valve Model Number* Std. Temp. | High Temp. | Avg. $C_v$ | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|---|
| 1 | 1/8 - 3/8 | W6476B2407 | W6476B2408 | 1.0 | 6.9 (175) | 1.7 (42) | 3.2 (82) | 1.8 (0.8) |
| 2 | 3/8 - 1/2 | W6476B3407 | W6476B3408 | 2.0 | 7.6 (192) | 2.1 (54) | 3.5 (90) | 2.3 (1.0) |
| 3 | 1/2 - 3/4 | W6476B4407 | W6476B4408 | 4.0 | 6.8 (172) | 2.6 (65) | 3.7 (94) | 3.3 (1.5) |

* Sub-base and electrical connector not included.
See pages 17-18 for sub-bases, manifolds and accessories.

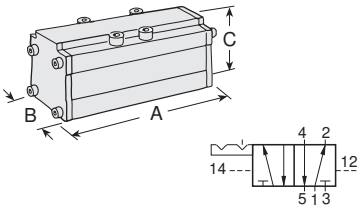
## 5/2 Valves – Single Pressure Controlled, Air Return




| ISO Size | Range of Port Sizes | Valve Model Number* Std. Temp. | High Temp. | Avg. $C_v$ | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|---|
| 1 | 1/8 - 3/8 | W6456B2411 | W6456B2412 | 1.0 | 4.3 (109) | 1.6 (41) | 1.8 (46) | 0.8 (0.4) |
| 2 | 3/8 - 1/2 | W6456B3411 | W6456B3412 | 2.0 | 5.1 (130) | 2.1 (53) | 2.1 (54) | 1.3 (0.6) |
| 3 | 1/2 - 3/4 | W6456B4411 | W6456B4412 | 4.0 | 6.4 (165) | 2.6 (66) | 2.2 (56) | 2.3 (1.1) |

* Sub-base and electrical connector not included.
See pages 17-18 for sub-bases, manifolds and accessories.

## 5/2 Valves – Double Pressure Controlled, Detented




| ISO Size | Range of Port Sizes | Valve Model Number* Std. Temp. | High Temp. | Avg. $C_v$ | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|---|
| 1 | 1/8 - 3/8 | W6456B2417 | W6456B2418 | 1.0 | 4.3 (119) | 1.6 (41) | 1.8 (47) | 0.8 (0.4) |
| 2 | 3/8 - 1/2 | W6456B3417 | W6456B3418 | 2.0 | 5.1 (130) | 2.1 (53) | 2.1 (54) | 1.3 (0.6) |
| 3 | 1/2 - 3/4 | W6456B4417 | W6456B4418 | 4.0 | 6.4 (165) | 2.6 (66) | 2.2 (59) | 2.3 (1.1) |

* Sub-base and electrical connector not included.
See pages 17-18 for sub-bases, manifolds and accessories.

**Electrical connection conforming to ANSI standard B93.55M is available. For more information, refer to ROSS Bulletin 379B (form number A10090).**

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

***Solenoid Pilot Controlled:***

**Solenoids:** AC or DC power.
**Standard Voltages:** See page 108; consult ROSS.
**Power Consumption:** Each solenoid; 11 VA inrush, 8.5 VA holding on 50 or 60 Hz; 6 watts on DC.
**Ambient Temperature:** 40° to 120°F (4° to 50°C); extended to 175°F (80°C) for High Temperature models.
**Media Temperature:** 40° to 175°F (4° to 80°C); extended to 220°F (105°C) for High Temperature models.
**Internal/External Supply:** Selected automatically.
**Manual Override:** Flush, non-locking.

***Pressure Controlled:***

**Ambient Temperature:** 40° to 175°F (4° to 80°C).
**Media Temperature:** 40° to 175°F (4° to 80°C); extended to 220°F (105°C) for High Temperature models.

***Common Specifications:***

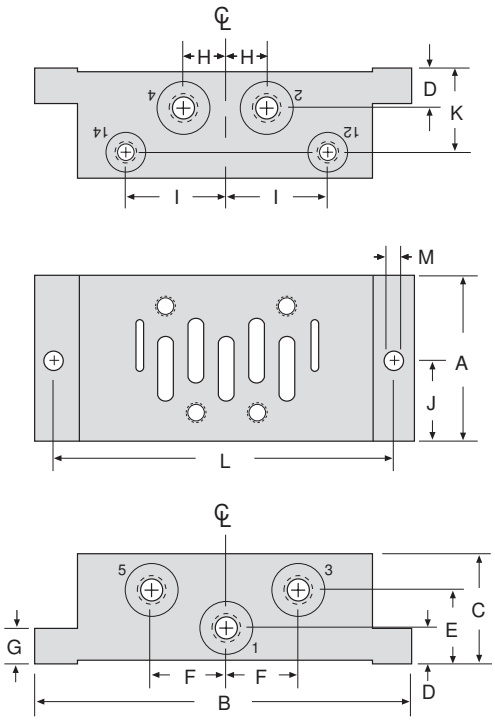
**Flow Media:** Filtered air.
**Inlet Pressure:** 30 to 150 psig (2 to 10 bar).
**Pilot Pressure:** Must be equal to or greater than inlet pressure.
**Port Threads:** NPT standard, BSPP. For BSPP threads add a "D" prefix to the model number, e.g., DW6476B2401.

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

# Sub-Bases & Manifolds for ISO Valves (5599/I) Series W60 & W64

### Sub-base Model Numbers and Port Sizes

| ISO Size | Side Ported | Port Sizes 1, 2, 4 | 3, 5 | 12, 14 |
|---|---|---|---|---|
| 1 | 654K91 | 1/8 | 1/4 | 1/8 |
| | 600C01 | 1/4 | 1/4 | 1/8 |
| | D600C01 | G1/4 | G1/4 | G1/8 |
| | 642K91 | 3/8 | 3/8 | 1/8 |
| 2 | 601C01 | 3/8 | 3/8 | 1/8 |
| | D601C01 | G3/8 | G3/8 | G1/8 |
| | 643K91 | 1/2 | 1/2 | 1/8 |
| 3 | 602C01 | 1/2 | 1/2 | 1/8 |
| | D602C01 | G1/2 | G1/2 | G1/8 |
| | 644K91 | 3/4 | 3/4 | 1/8 |




### Sub-base Dimensions inches (mm)

| | ISO 1 | ISO 2 | ISO 3 |
|---|---|---|---|
| A | 1.89 (48) | 2.24 (57) | 2.80 (71) |
| B | 4.33 (110) | 4.88 (124) | 5.87 (149) |
| C | 1.26 (32) | 1.57 (40) | 1.26 (32)* |
| D | 0.41 (11) | 0.55 (14) | 0.67 (17) |
| E | 0.85 (22) | 1.02 (26) | 0.67 (17) |
| F | 0.85 (22) | 1.10 (28) | 1.34 (34) |
| G | 0.39 (10) | 0.51 (13) | 0.71 (18) |
| H | 0.47 (12) | 0.59 (15) | 0.63 (16) |
| I | 1.14 (29) | 1.46 (37) | 1.77 (45) |
| J | 0.94 (24) | 1.12 (29) | 1.40 (36) |
| K | 0.93 (24) | 1.18 (30) | 0.87 (22) |
| L | 3.86 (98) | 4.41 (112) | 5.35 (136) |
| M | 0.22 (6) | 0.26 (7) | 0.26 (7) |

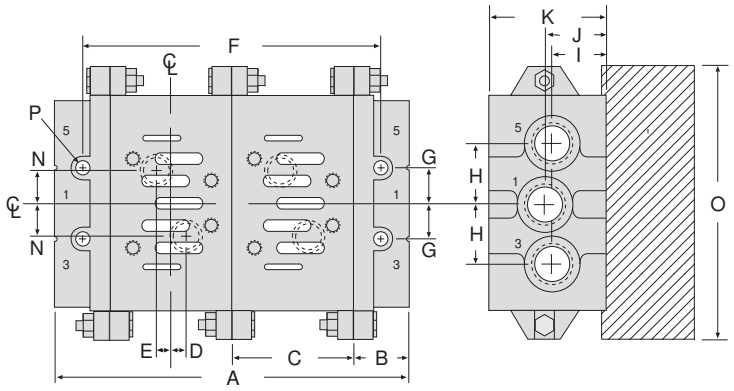
* 1.77 (45) on sub-base 644K91.

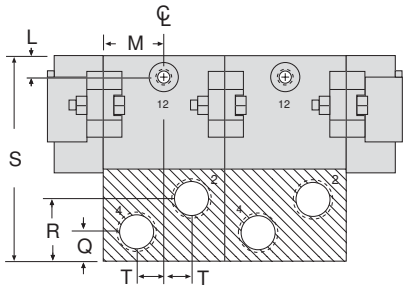
In addition to the manifold stations, an end station kit must be ordered for each manifold installation. End-ported stations are assemblies consisting of a bottom-ported station and an end-ported adaptor plate. Adaptor plates are cross-hatched in the drawings below.

### MANIFOLD NUMBERS and PORT SIZES

| ISO Size | Bottom Ported Station* | End Ported Station* | End Station Kit* | Port Sizes 2, 4 | 1, 3, 5 | 12, 14 |
|---|---|---|---|---|---|---|
| 1 | 460K91 | 664K91 | 326K86 | 1/4 | 3/8 | 1/8 |
| 2 | 461K91 | 665K91 | 327K86 | 3/8 | 1/2 | 1/8 |
| 3 | 462K91 | 666K91 | 328K86 | 1/2 | 1 | 1/8 |

*NPT port threads. For BSPP threads, add a "D" prefix to the model number, e.g., D460K91.




**NOTE:**
Lined portions of drawings are end-ported adaptors which are included only with end-ported stations.

### ACCESSORIES and OPTIONS for MANIFOLDS

Blank Station Kits, Blocking Discs, Pressure Plates, Transition Plates and other available options are shown on page 18.

A and F dimensions are for a 2-station manifold.
For each additional station add the C dimension to obtain new A and F dimensions.

### Manifold Dimensions inches (mm)

| | ISO 1 | ISO 2 | ISO 3 |
|---|---|---|---|
| A | 5.12 (130) | 6.46 (164) | 7.95 (202) |
| B | 0.87 (22) | 1.02 (26) | 1.18 (30) |
| C | 1.69 (43) | 2.20 (56) | 2.80 (71) |
| D | 0.30 (8) | 0.24 (6) | 0.31 (8) |
| E | 0.06 (2) | 0.20 (5) | 0.24 (6) |
| F | 4.25 (108) | 5.43 (138) | 6.77 (172) |
| G | 0.55 (14) | 0.69 (18) | 1.02 (26) |
| H | 0.94 (24) | 1.24 (32) | 1.85 (47) |
| I | 0.83 (21) | 0.87 (22) | 1.22 (31) |
| J | 0.94 (24) | 0.94 (24) | 1.34 (34) |
| K | 1.81 (46) | 1.85 (47) | 2.20 (56) |
| L | 0.33 (9) | 0.35 (9) | 0.39 (10) |
| M | 0.85 (22) | 1.10 (28) | 1.40 (36) |
| N | 0.51 (13) | 0.59 (15) | 0.75 (19) |
| O | 4.33 (110) | 5.31 (135) | 7.48 (190) |
| P | 0.27 (7) | 0.35 (9) | 0.47 (12) |
| Q | 0.47 (12) | 0.55 (14) | 0.67 (17) |
| R | 0.98 (25) | 1.02 (26) | 1.14 (29) |
| S | 3.19 (81) | 3.54 (90) | 3.90 (99) |
| T | 0.43 (11) | 0.57 (15) | 0.71 (18) |

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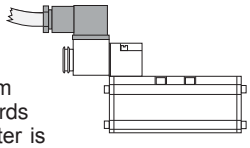
# Accessories for ISO Valves (5599/I) Series W60 & W64

**CONNECTORS for use with DROPCORDS (DIN 43650, Form A)**
Electrical connectors are required to connect the valve solenoids to the drop cords supplying electrical power. Each connector can be oriented so that the cord can exit in any one of four directions: outboard, inboard, and to the right or to the left of the valve centerline. Cords of 6 mm to 10 mm diameter can be used.

**Indicator Lights.** Lights in connectors with a translucent housing can be used as indicator lights to show when solenoids are energized.

**Wired Connectors.** Connectors have a 6½ ft (2 meter) cord with three 18 gauge conductors.
Cord exits outboard as shown at the right. Insulation is water, oil, and abrasion resistant. Connectors are available with 10 mm cords for maximum abrasion resistance, or with 6 mm cords where added flexibility or small diameter is required.



**CONNECTORS for use with THREADED CONDUIT**
Connectors similar to those above but threaded to accept 1/2 inch electrical conduit fittings are also available.

**FLYING SOLENOID LEADS**
Instead of the connectors described above, power to the solenoids can also be supplied via "flying leads." These are 18 gauge insulated wires with spade connectors at one end. A kit of flying leads consists of three wires, each 39 inches (one meter) long. Order by kit number **725K77**.

**PART NUMBERS of ELECTRICAL CONNECTORS**

| Connector Type | Without Light | With Light* |
|---|---|---|
| For use with drop cord (Cord not included) | 937K87 | 936K87 |
| Wired with 6 mm cord | 721K77 | 720K77 |
| Wired with 10 mm cord | 371K77 | 383K77 |
| For use with threaded conduit | 723K77 | 724K77 |

* Specify solenoid voltage.

**BLANK STATION KITS**
A blank station plate is used to cover the top of a manifold station that is not in use. A kit consists of a metal plate 0.32 inch (8 mm) thick, a gasket, and mounting bolts.

**ISO Size 1:** 546H77
**ISO Size 2:** 694K77
**ISO Size 3:** 537H77

**TRANSITION PLATES**
Different size ISO valves can be used in the same manifold installation by means of transition plates. The inlet and exhaust ports of two different size manifold stations are connected by means of a transition plate installed between the two stations Thickness [inches (mm)] of the plates is shown below.

**ISO Size 1 to 2** [0.79 (20)]: D355K86
**ISO Size 2 to 3** [1.26 (32)]: D356K86
**ISO Size 1 to 3** [1.26 (32)]: D357K86

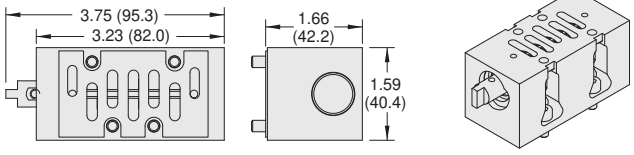
**INTERPOSED FLOW CONTROLS for SPOOL VALVES**
An interposed flow control unit regulates the exhaust flow of air from a pneumatic cylinder, thereby controlling the extension and retraction speeds. Separate controls regulate the air flow from each end of the cylinder. Being located between the valve and base, the unit requires no additional piping. Available only for Series W60 and W63 spool valves.

**ISO Size 1:** 701B77
**ISO Size 2:** 702B77
**ISO Size 3:** 722K77

**INDEPENDENT PRESSURE PLATES**
When a valve in a manifold installation must work at a different pressure than that supplied to the manifold, an independent supply can be provided via an independent pressure plate. The pressure plate mounts between valve and base and isolates the valve from the manifold inlet pressure. The independent supply is connected to an inlet port in the end of the pressure plate.

**ISO Size 1** (1/4 inlet port): 703K77
**ISO Size 2** (3/8 inlet port): 692K77
**ISO Size 3** (1/2 inlet port): 715K77

**INTERPOSED SHUT-OFF**
Manually actuated with a 1/4 turn, the interposed shut-off isolates all ports, including the pilot.

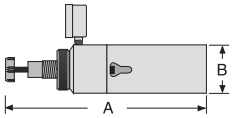



**ISO Size 1:** 1871B91
**ISO Size 2 & 3:** For ordering, please contact ROSS.

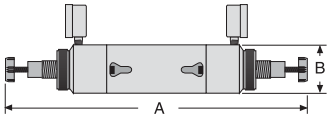
**BLOCKING DISKS**
Ports between manifold stations can be closed by means of blocking disks.

| | Single Disk | Kit of 3 Disks |
|---|---|---|
| **ISO Size 1:** | 235A40 | 1007K77 |
| **ISO Size 2:** | 236A40 | 1008K77 |
| **ISO Size 3:** | 237A40 | 1009K77 |

**INTERPOSED PRESSURE REGULATORS**
Both single and double pressure regulators are available. Single pressure regulators provide the same regulated pressure at both outlet ports. Double pressure regulators allow the pressure at each outlet port to be set independently. Pressure can be regulated from 0 to 150 psig (0 to 10 bar). Requires no new piping.




**Single Regulator**




**Double Regulator**

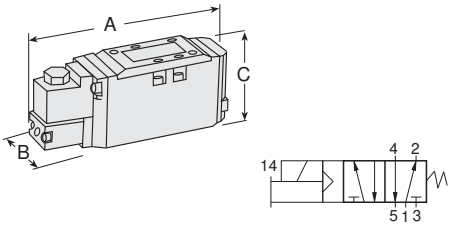
| | Single | Double |
|---|---|---|
| **ISO Size 1:** | 1300K91 | 1302K91 |
| **ISO Size 2:** | 1303K91 | 1305K91 |
| **ISO Size 3:** | 1306K91 | 1308K91 |

**Regulator Dimensions -** inches (mm)

| ISO Size | **A** (Single) | **A** (Double) | **B** (Single/Double) |
|---|---|---|---|
| **1** | 7.3 (186) | 13.2 (336) | 1.5 (39) |
| **2** | 8.3 (211) | 14.8 (376) | 2.0 (51) |
| **3** | 10.5 (267) | 18.3 (465) | 2.5 (64) |

# Spool and Sleeve Valves for ISO Sub-Bases (5599/II) Series W65

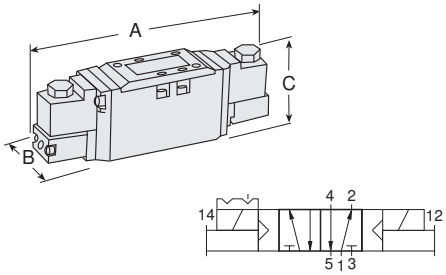
## 5/2 Valves – Single Solenoid Pilot Controlled, Spring Return




| ISO Size | Port Size | Valve Model Number* | Avg. $C_v$ | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|
| 1 | 1/4 - 3/8 | W6576A2401 | 1.0 | 6.3 (161) | 1.6 (41) | 2.7 (69) | 1.5 (0.7) |
| 2 | 3/8 - 1/2 | W6576A3401 | 2.3 | 7.3 (186) | 2.1 (52) | 2.8 (71) | 2.0 (1.0) |
| 3 | 1/2 - 3/4 | W6576A4401 | 3.4 | 8.5 (216) | 2.6 (67) | 3.1 (78) | 3.5 (1.6) |

* Sub-base not included. See pages 21-23 for sub-bases, manifolds and accessories.

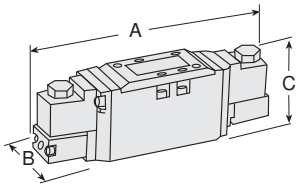
## 5/2 Valves – Double Solenoid Pilot Controlled, Detented

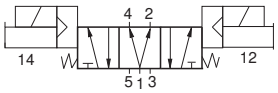



| ISO Size | Port Size | Valve Model Number* | Avg. $C_v$ | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|
| 1 | 1/4 - 3/8 | W6576A2407 | 1.0 | 8.8 (224) | 1.6 (41) | 2.7 (69) | 2.0 (1.0) |
| 2 | 3/8 - 1/2 | W6576A3407 | 2.3 | 9.0 (228) | 2.1 (52) | 2.8 (71) | 2.5 (1.2) |
| 3 | 1/2 - 3/4 | W6576A4407 | 3.4 | 10.0 (254) | 2.6 (67) | 3.1 (78) | 4.0 (1.9) |

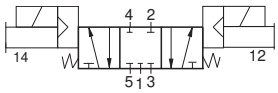
* Sub-base not included. See pages 21-23 for sub-bases, manifolds and accessories.

## 5/3 Valves – Double Solenoid Pilot Controlled

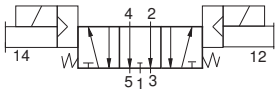


Power Center



Closed Center



Open Center

| ISO Size | Port Size | Valve Model Number* Power Center | Closed Center | Open Center | Avg. $C_v$ | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 1/4 - 3/8 | W6577A2902 | W6577A2401 | W6577A2407 | 1.0 | 8.8 (224) | 1.6 (41) | 2.7 (69) | 2.0 (1.0) |
| 2 | 3/8 - 1/2 | W6577A3901 | W6577A3401 | W6577A3407 | 2.3 | 9.0 (228) | 2.1 (52) | 2.8 (71) | 2.5 (1.2) |
| 3 | 1/2 - 3/4 | W6577A4900 | W6577A4401 | W6577A4407 | 3.4 | 10.0 (254) | 2.6 (67) | 3.1 (78) | 4.0 (1.9) |

* Sub-base not included. See pages 21-23 for sub-bases, manifolds and accessories.

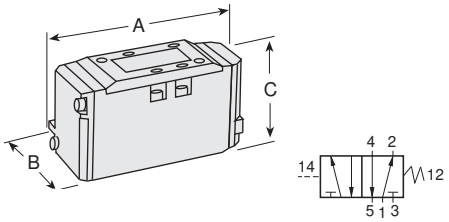
**The W65 Series has a base electrical connector which eliminates the need to disconnect wires to remove the valve. This eliminates drop cords, simplifies maintenance and connection to Serial Data Communication systems. For more information, refer to Bulletin 379B (form number A10090).**

**STANDARD SPECIFICATIONS** (for valves on this page)**:**
**Solenoids:** Rated for continuous duty.
**Standard Voltages:** 100-110 volts, 50 Hz; 100-120 volts, 60 Hz; 24 volts DC; 110 volts DC. For other voltages, consult ROSS.
**Power Consumption:** Each solenoid. 6.5 VA holding on 50 or 60 Hz; 3.5 watts on DC (at 10 bar).
**Ambient Temperature:** 40° to 120°F (4° to 50°C).
**Media Temperature:** 40° to 175°F (4° to 80°C).
**Flow Media:** Filtered air; 5 micron recommended.
**Standard Inlet Pressure:**
*Size 1 models:* 2-10 bar; *Size 2 & 3 models:* 1-10 bar.
All sizes also available up to 16 bar.
**Pilot Supply:** Internal/external supply selected automatically.
Required pressure at least 30 psig (2 bar).

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

# Spool and Sleeve Valves for ISO Sub-Bases (5599/II) Series W65

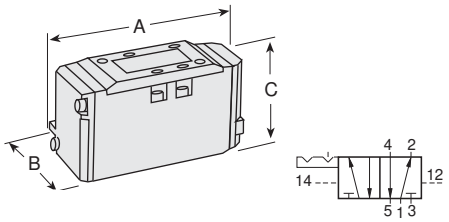
## 5/2 Valves – Single Pressure Controlled, Spring Return




| ISO Size | Range of Port Sizes | Valve Model Number* | Avg. $C_v$ | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|
| 1 | 1/4 - 3/8 | W6556A2411 | 1.0 | 4.8 (121) | 1.6 (41) | 2.7 (69) | 0.8 (0.4) |
| 2 | 3/8 - 1/2 | W6556A3411 | 2.3 | 5.8 (148) | 2.1 (52) | 2.8 (71) | 1.5 (0.7) |
| 3 | 1/2 - 3/4 | W6556A4411 | 3.4 | 7.0 (178) | 2.6 (67) | 3.1 (78) | 3.0 (1.4) |

* Sub-base not included. See pages 21-23 for sub-bases, manifolds and accessories.

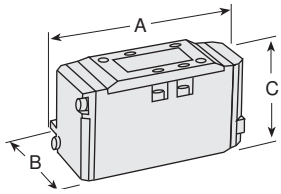
## 5/2 Valves – Double Pressure Controlled, Detented

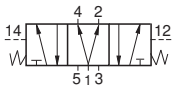



| ISO Size | Range of Port Sizes | Valve Model Number* | Avg. $C_v$ | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|
| 1 | 1/4 - 3/8 | W6556A2417 | 1.0 | 4.8 (121) | 1.6 (41) | 2.7 (69) | 0.8 (0.4) |
| 2 | 3/8 - 1/2 | W6556A3417 | 2.3 | 5.8 (148) | 2.1 (52) | 2.8 (71) | 1.5 (0.7) |
| 3 | 1/2 - 3/4 | W6556A4417 | 3.4 | 7.0 (178) | 2.6 (67) | 3.1 (78) | 3.0 (1.4) |

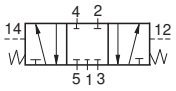
* Sub-base not included. See pages 21-23 for sub-bases, manifolds and accessories.

## 5/3 Valves – Double Pressure Controlled

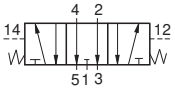


Power Center



Closed Center



Open Center

| ISO Size | Port Size | Valve Model Number* Power Center | Closed Center | Open Center | Avg. $C_v$ | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 1/4 - 3/8 | – | W6557A2411 | W6557A2417 | 1.0 | 4.8 (121) | 1.6 (41) | 2.7 (69) | 0.8 (0.4) |
| 2 | 3/8 - 1/2 | W6557A3901 | W6557A3411 | W6557A3417 | 2.3 | 5.8 (148) | 2.1 (52) | 2.8 (71) | 1.5 (0.7) |
| 3 | 1/2 - 3/4 | W6557A4900 | W6557A4411 | W6557A4417 | 3.4 | 7.0 (178) | 2.6 (67) | 3.1 (78) | 3.0 (1.4) |

* Sub-base not included. See pages 21-23 for sub-bases, manifolds and accessories.

**STANDARD SPECIFICATIONS** (for valves on this page)**:**
**Ambient/Media Temperature:** 40° to 175°F (4° to 80°C).
**Flow Media:** Filtered air; 5 micron recommended.

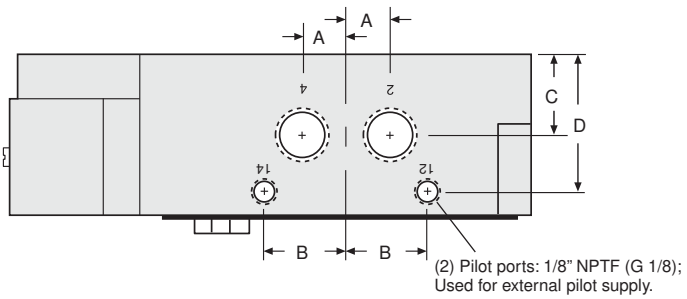
**Standard Inlet Pressure:**
*Size 1 models:* 2-10 bar; *Size 2 & 3 models:* 1-10 bar.
All sizes also available up to 16 bar.
**Pilot Supply:** Internal/external supply selected automatically.
Required pressure at least 30 psig (2 bar).

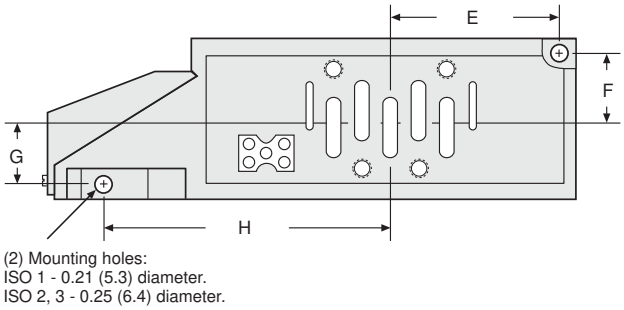
**IMPORTANT NOTE:** Please read carefully and thoroughly all of the **CAUTIONS** on the inside back cover.

# Sub-Bases for ISO Valves (5599/II) Series W65

## Side and Bottom-Ported Sub-Bases

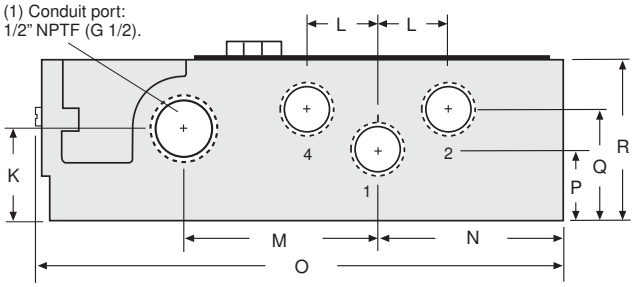
| ISO Size | Port Size | Sub-Base Station Model Number |
|---|---|---|
| ISO 1 | 1/4 NPTF Side | 949N91 |
| | 1/4 NPTF Side/Bottom | 971N91 |
| | 3/8 NPTF Side | 950N91 |
| | 3/8 NPTF Side/Bottom | 972N91 |
| | G 1/4 Side | D949N91 |
| | G 3/8 Side | D950N91 |
| ISO 2 | 3/8 NPTF Side | 951N91 |
| | 3/8 NPTF Side/Bottom | 952N91 |
| | 1/2 NPTF Side | 953N91 |
| | 1/2 NPTF Side/Bottom | 954N91 |
| | G 1/2 Side | D953N91 |
| ISO 3 | 1/2" NPTF Side | 955N91 |
| | 1/2" NPTF Side/Bottom | 956N91 |
| | 3/4" NPTF Side | 957N91 |
| | 3/4" NPTF Side/Bottom | 958N91 |
| | G 1/2 Side | D955N91 |
| | G1/2 Side/Bottom | D956N91 |
| | G 3/4 Side | D957N91 |
| | G 3/4 Side/Bottom | D958N91 |

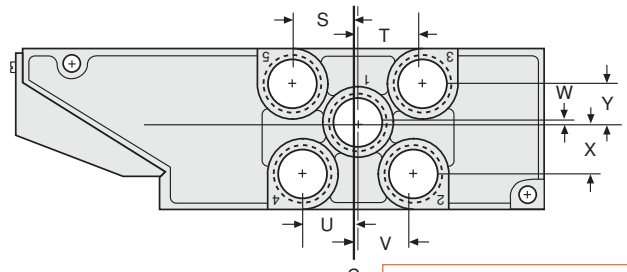


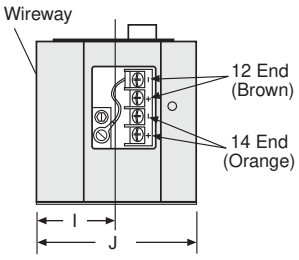

**Sub-Base Dimensions** inches (mm)

| | ISO 1 | ISO 2 | ISO 3 |
|---|---|---|---|
| A | 0.5 (13) | 0.6 (16) | 0.8 (21) |
| B | 1.0 (26) | 1.3 (33) | 1.8 (45) |
| C | 0.8 (21) | 1.2 (31) | 1.3 (34) |
| D | 1.5 (38) | 1.9 (49) | 2.7 (70) |
| E | 1.6 (39) | 2.3 (57) | 2.5 (63) |
| F | 0.9 (23) | 1.1 (29) | 1.5 (39) |
| G | 0.9 (23) | 1.1 (29) | 1.4 (36) |
| H | 3.6 (92) | 4.3 (108) | 5.4 (137) |
| I | 1.1 (29) | 1.4 (35) | 1.8 (45) |
| J | 2.3 (58) | 2.8 (70) | 3.5 (90) |
| K | 0.9 (24) | 1.5 (37) | 1.8 (47) |
| L | 0.9 (22) | 1.1 (27) | 1.5 (38) |
| M | 2.4 (60) | 3.0 (75) | 4.1 (104) |
| N | 1.8 (46) | 2.5 (64) | 2.7 (69) |
| O | 6.5 (164) | 7.8 (197) | 9.3 (235) |
| P | 0.8 (21) | 1.1 (28) | 1.3 (34) |
| Q | 1.3 (34) | 1.7 (44) | 2.0 (51) |
| R | 1.9 (47) | 2.4 (60) | 3.3 (85) |
| S | 0.8 (21) | 1.1 (27) | 1.6 (42) |
| T | 1.1 (27) | 1.1 (27) | 1.6 (42) |
| U | 0.5 (13) | 0.9 (22) | 1.1 (27) |
| V | 0.6 (15) | 0.9 (22) | 1.1 (27) |
| W | 0.3 (8) | 0.1 (3) | 0.8 (20) |
| X | 0.7 (17) | 0.8 (20) | 0.8 (20) |
| Y | 0.6 (16) | 0.9 (20) | 0.8 (20) |




*Note: Port 1 is 0.117" (3 mm) off center line.*
*ISO 2, 3 fall on center line.*




**Assembled manifolds also available, consult ROSS.**

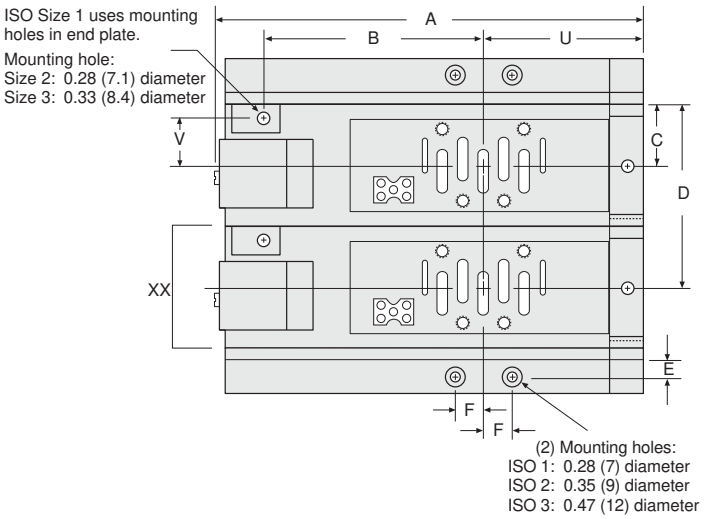
Estudio de Fluidos
Pol. Ind. de Guarnizo, Parcela 207
39611 GUARNIZO (Cantabria), España
942 25 27 50
edf@edfluidos.com
www.edfluidos.com

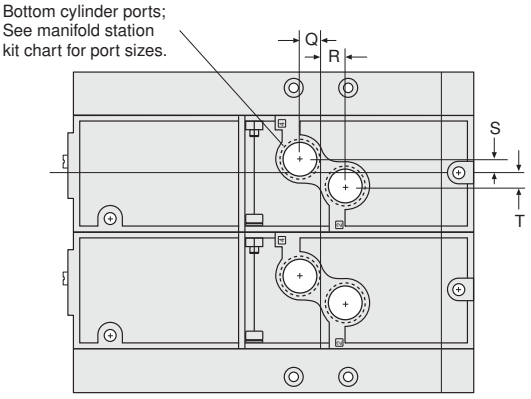
# Manifolds for ISO Valves (5599/II) Series W65

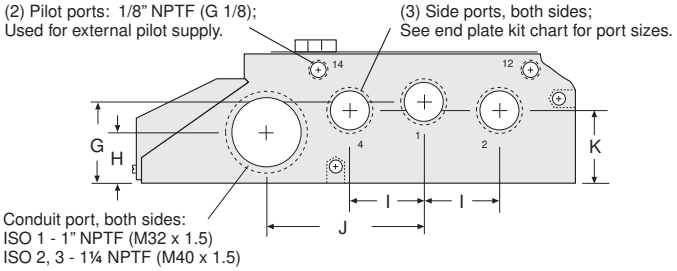
## Bottom or End-Ported Manifolds

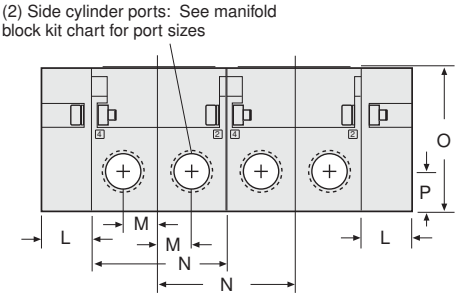
**Manifold Dimensions** inches (mm)

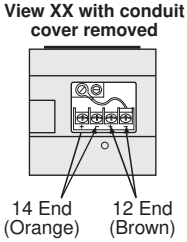
| | ISO 1 | ISO 2 | ISO 3 |
|---|---|---|---|
| **A** | 7.2 (183) | 9.0 (229) | 10.6 (270) |
| **B** | 4.9 (125) | 6.0 (152) | 7.1 (180) |
| **C** | 1.0 (26) | 1.3 (33) | 1.7 (43) |
| **D** | 3.1 (79) | 3.9 (100) | 5.1 (128) |
| **E** | 0.6 (14) | 0.6 (16) | 0.6 (15) |
| **F** | 0.6 (14) | 0.7 (17) | 1.0 (26) |
| **G** | 1.3 (34) | 1.7 (42) | 1.8 (46) |
| **H** | 1.0 (25) | 1.2 (30) | 1.2 (31) |
| **I** | 1.1 (28) | 1.4 (35) | 2.1 (52) |
| **J** | 2.5 (64) | 3.1 (79) | 4.1 (104) |
| **K** | 1.2 (31) | 1.6 (40) | 1.7 (42) |
| **L** | 0.9 (22) | 1.0 (25) | 1.2 (30) |
| **M** | 0.5 (13) | 0.6 (16) | 0.8 (21) |
| **N** | 2.1 (53) | 2.6 (67) | 3.4 (86) |
| **O** | 2.2 (55) | 2.6 (66) | 3.1 (78) |
| **P** | 0.6 (16) | 0.9 (22) | 0.8 (20) |
| **Q** | 0.5 (13) | 0.6 (15) | 0.7 (18) |
| **R** | 0.5 (13) | 0.6 (15) | 0.8 (21) |
| **S** | 0.3 (7) | 0.3 (8) | 0.5 (13) |
| **T** | 0.3 (7) | 0.3 (8) | 0.5 (12) |
| **U** | 2.0 (51) | 2.8 (67) | 3.1 (79) |
| **V** | ---------- | 1.0 (26) | 1.3 (31) |




### End Station Kit Numbers*

| Series | Port Size | Part Number** |
|---|---|---|
| **ISO 1** | 3/8" NPTF | 493N86 |
| **ISO 2** | 1/2" NPTF | 494N86 |
| **ISO 3** | 1" NPTF | 495N86 |

*Each end station kit includes left and right end plates, socket head screws, nuts and seals.
**NPT port threads. For BSPP threads, add a "D" prefix to the model number, e.g., D493N86.

### Manifold Station Assembly Numbers*

| Series | Port Size | Part Number** |
|---|---|---|
| **ISO 1** | 1/4" NPTF End/Bottom | 959N91 |
| | 3/8" NPTF End/Bottom | 960N91 |
| **ISO 2** | 3/8" NPTF End/Bottom | 961N91 |
| | 1/2" NPTF End/Bottom | 962N91 |
| **ISO 3** | 1/2" NPTF End/Bottom | 963N91 |
| | 3/4" NPTF End/Bottom | 964N91 |

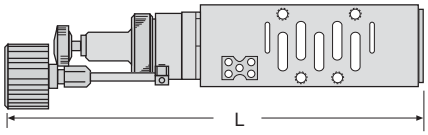
*Each manifold station assembly includes a manifold assembly, socket head screws, nuts and seals.
**NPT port threads. For BSPP threads, add a "D" prefix to the model number, e.g., D959N91.

# Accessories for ISO Valves (5599/II) Series 65

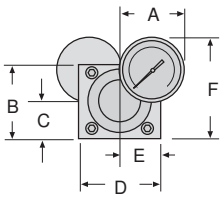
## Interposed Regulators

The interposed regulator controls the pressure through the base-mounted valve. These interposed devices are "sandwich" style, mounting between a valve and base or manifold. When using a dual interposed regulator for a Series 65 solenoid valve, the valve **must be externally piloted (port 14)**.

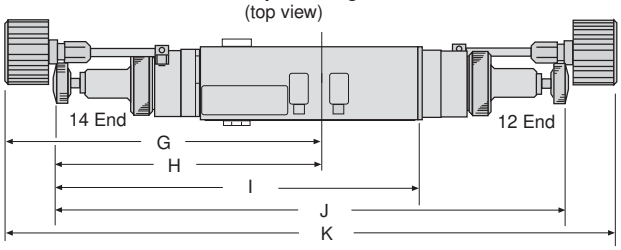
**Single Interposed Regulator**
(top view)




**WARNING**
Double interposed regulators will reverse output ports - the 12 solenoid will pressurize the 4 port, the 14 solenoid will pressurize the 2 port - which may cause unexpected, potentially dangerous cylinder movement at valve pressurization.



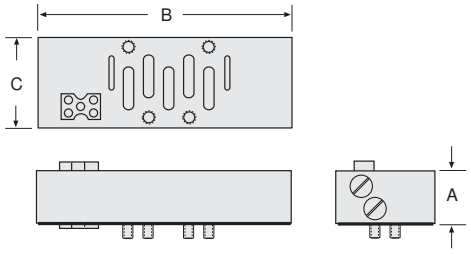

**Double Interposed Regulator**
(top view)




| ISO Size | Part Number | Dimensions inches (mm) A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1** (Sgl.) | 965N91 | 1.6 (39) | 1.8 (45) | 0.9 (23) | 1.7 (43) | 0.9 (22) | 2.5 (63) | 6.2 (157) | 7.2 (182) | 8.0 (204) | 11.6 (295) | 13.6 (345) | 9.0 (229) |
| **1** (Dbl.) | 966N91 | 1.6 (39) | 1.8 (45) | 0.9 (23) | 1.7 (43) | 0.9 (22) | 2.5 (63) | 6.2 (157) | 7.2 (182) | 8.0 (204) | 11.6 (295) | 13.6 (345) | 9.0 (229) |
| **2** (Sgl.) | 967N91 | 1.6 (39) | 1.8 (45) | 0.9 (23) | 2.0 (51) | 1.0 (26) | 2.5 (63) | 6.5 (166) | 7.5 (191) | 9.0 (229) | 12.6 (320) | 14.6 (370) | 10.0 (254) |
| **2** (Dbl.) | 968N91 | 1.6 (39) | 1.8 (45) | 0.9 (23) | 2.0 (51) | 1.0 (26) | 2.5 (63) | 6.5 (166) | 7.5 (191) | 9.0 (229) | 12.6 (320) | 14.6 (370) | 10.0 (254) |
| **3** (Sgl.) | 969N91 | 2.1 (52) | 2.7 (67) | 1.3 (34) | 2.6 (66) | 1.3 (33) | 3.4 (85) | 9.5 (242) | 8.0 (203) | 10.6 (270) | 18.2 (463) | 15.2 (386) | 13.0 (330) |
| **3** (Dbl.) | 970N91 | 2.1 (52) | 2.7 (67) | 1.3 (34) | 2.6 (66) | 1.3 (33) | 3.4 (85) | 9.5 (242) | 8.0 (203) | 10.6 (270) | 18.2 (463) | 15.2 (386) | 13.0 (330) |

## Flow Control Kits

The interposed flow control independently adjusts the speed of a cylinder's extend and retract motions. This action is achieved by throttling the flow of exhaust air through ports 3 and 5 by means of a separate needle valve across each of these ports. These interposed devices are "sandwich" style, mounting between a valve and a base or manifold.




| ISO Size | Part Number | Dimensions inches (mm) A | B | C |
|---|---|---|---|---|
| **1** | 1371N77 | 0.9 (24) | 3.8 (97) | 1.7 (43) |
| **2** | 1372N77 | 1.3 (33) | 5.1 (130) | 2.0 (51) |
| **3** | 1373N77 | 1.6 (41) | 5.6 (142) | 2.6 (66) |

## Transition Plates

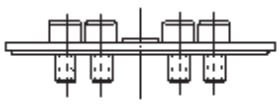
To bank different manifold sizes together.

**ISO 1 to ISO 2**
Left to right ..... 1387N77
Right to left ..... 1388N77

**ISO 2 to ISO 3**
Left to right ..... 1389N77
Right to left ..... 1390N77

## Blank Station Kits

A blank station plate is used to cover the top of a manifold station not in use.



| ISO Size | Part Number |
|---|---|
| **1** | 1381N77 |
| **2** | 1382N77 |
| **3** | 1383N77 |

## Pilot Port Blocking Plug

The pilot blocking plug blocks the pilot ports between manifold stations.

| ISO Size | Part Number |
|---|---|
| **1** | 1375N77 |
| **2** | 1377N77 |
| **3** | 1379N77 |

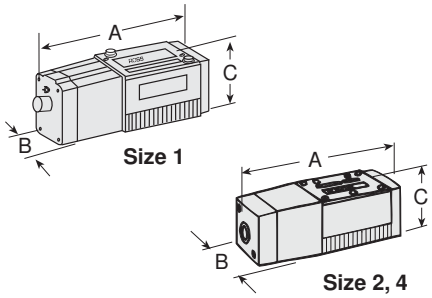
## Blocking Disk Kits

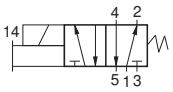
A blocking disk closes the ports between manifold stations.

| ISO Size | Part Number |
|---|---|
| **1** | 1376N77 |
| **2** | 1378N77 |
| **3** | 1380N77 |

# Spool & Sleeve Valves for ANSI Sub-Bases Series W70

## 5/2 Valves – Single Direct Solenoid, Spring Return

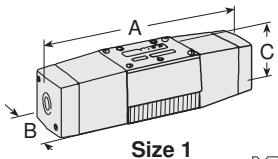


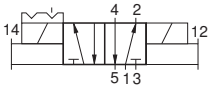




| ANSI Size | Range of Port Sizes | Valve Model Number* | Avg. $C_v$ | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|
| 1 | 1/4 - 3/8 | W7016B2331 | 1.0 | 7.0 (177) | 2.0 (50) | 2.3 (58) | 3.5 (1.6) |
| 2.5 | 3/8 - 1/2 | W7016A3331 | 2.5 | 8.3 (209) | 2.6 (66) | 2.6 (66) | 3.3 (1.5 |
| 4 | 3/8 - 3/4 | W7016C4331 | 4.2 | 10.0 (254) | 3.5 (88) | 2.8 (70) | 4.3 (1.9) |

* Sub-base not included. See pages 28-30 for sub-bases, manifolds and accessories.

## 5/2 Valves – Double Direct Solenoid, Detented

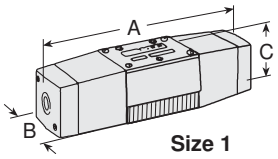


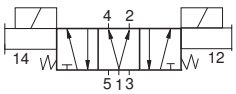




| ANSI Size | Range of Port Sizes | Valve Model Number* | Avg. $C_v$ | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|
| 1 | 1/4 - 3/8 | W7016B2332 | 1.0 | 8.9 (226) | 2.0 (50) | 2.3 (58) | 4.5 (2.0 |
| 2.5 | 3/8 - 1/2 | W7016A3332 | 2.5 | 10.8 (273) | 2.6 (66) | 2.6 (66) | 5.0 (2.3) |
| 4 | 3/8 - 3/4 | W7016C4332 | 4.2 | 13.2 (335) | 3.5 (88) | 2.8 (70) | 5.8 (2.6) |

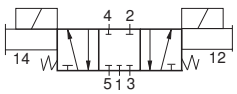
* Sub-base not included. See pages 28-30 for sub-bases, manifolds and accessories.

## 5/3 Valves – Double Direct Solenoid

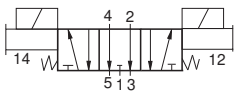


Power Center



Closed Center



Open Center

| ANSI Size | Range of Port Sizes | Valve Model Number* Power Center | Closed Center | Open Center | Avg. $C_v$ | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 1/8 - 3/8 | W7017B2905 | W7017B2331 | W7017B2332 | 1.0 | 8.9 (226) | 2.0 (50) | 2.3 (58) | 4.5 (2.0) |
| 2.5 | 3/8 - 1/2 | – | W7017A3331 | W7017A3332 | 2.5 | 10.8 (273) | 2.6 (66) | 2.6 (66) | 5.0 (2.3) |
| 4 | 1/2 - 3/4 | – | W7017C4331 | W7017C4332 | 4.2 | 13.2 (335) | 3.5 (88) | 2.8 (70) | 5.8 (2.6) |

* Sub-base not included. See pages 28-30 for sub-bases, manifolds and accessories.

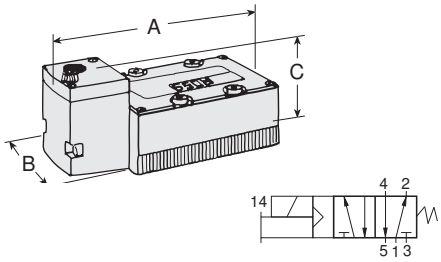
**STANDARD SPECIFICATIONS** (for valves on this page)**:**
**Solenoids:** AC power; DC for size 1 models only.
**Standard Voltages:** See page 108; consult ROSS.
**Indicator Light:** Available.
**Power Consumption:** Each solenoid.
*Size 1 models:* 140 VA inrush, 30 VA holding on 50 or 60 Hz; 20 watts on DC.
*All other sizes:* 380 VA inrush, 58 VA holding.

**Ambient/Media Temperature:** 40° to 175°F (4° to 80°C).
**Flow Media:** Filtered air; 5 micron recommended.
**Inlet Pressure:** Vacuum to 150 psig (10 bar).

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

# Spool & Sleeve Valves for ANSI Sub-Bases Series W70

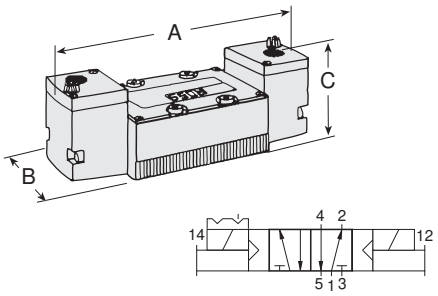
## 5/2 Valves – Single Solenoid Pilot Controlled, Spring Return




| ANSI Size | Range of Port Sizes | Valve Model Number* | Avg. $C_v$ | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|
| 1 | 1/4 - 3/8 | W7076B2331 | 1.0 | 6.4 (163) | 2.0 (50) | 2.4 (59) | 3.0 (1.4) |
| 2.5 | 3/8 - 1/2 | W7076A3331 | 2.5 | 7.3 (185) | 2.7 (67) | 3.6 (91) | 3.0 (1.4) |
| 4 | 3/8 - 3/4 | W7076D4331 | 4.2 | 8.4 (212) | 3.5 (88) | 4.0 (101) | 5.3 (2.4) |
| 10 | 3/4 - 1¼ | W7076C6331 | 10 | 9.8 (249) | 3.9 (99) | 4.0 (101) | 7.3 (3.3) |
| 20 | 1¼ - 1½ | W7076C8331 | 22 | 15 (381) | 5.6 (142) | 4.1 (104) | 14.5 (6.5) |

* Sub-base not included. See pages 28-30 for sub-bases, manifolds and accessories.

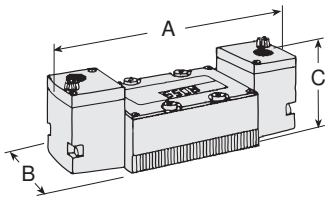
## 5/2 Valves – Double Solenoid Pilot Controlled, Detented

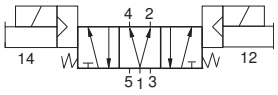



| ANSI Size | Range of Port Sizes | Valve Model Number* | Avg. $C_v$ | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|
| 1 | 1/4 - 3/8 | W7076B2332 | 1.0 | 7.7 (194) | 2.0 (50) | 2.4 (59) | 4.0 (1.8) |
| 2.5 | 3/8 - 1/2 | W7076A3332 | 2.5 | 8.8 (224) | 2.7 (67) | 3.6 (91) | 4.0 (1.8) |
| 4 | 3/8 - 3/4 | W7076D4332 | 4.2 | 9.8 (249) | 3.5 (88) | 4.0 (101) | 6.5 (2.9) |
| 10 | 3/4 - 1¼ | W7076C6332 | 10 | 11.3 (286) | 3.9 (99) | 4.0 (101) | 9.0 (4.1) |
| 20 | 1¼ - 1½ | W7076C8332 | 22 | 16.5 (417) | 5.6 (142) | 4.1 (104) | 15.8 (6.8) |

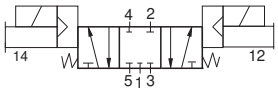
* Sub-base not included. See pages 28-30 for sub-bases, manifolds and accessories.

## 5/3 Valves – Double Solenoid Pilot Controlled

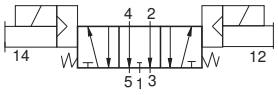



**Power Center**




**Closed Center**




**Open Center**

| ANSI Size | Range of Port Sizes | Valve Model Number* Power Center | Closed Center | Open Center | Avg. $C_v$ | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 1/4 - 3/8 | W7077B2906 | W7077B2331 | W7077B2332 | 1.0 | 7.7 (194) | 2.0 (50) | 2.4 (59) | 4.0 (1.8 |
| 2.5 | 3/8 - 1/2 | W7077A3904 | W7077A3331 | W7077A3332 | 2.5 | 8.8 (224) | 2.7 (67) | 3.6 (91) | 4.0 (1.8) |
| 4 | 3/8 - 3/4 | W7077C4939 | W7077D4331 | W7077D4332 | 4.2 | 9.8 (249) | 3.5 (88) | 4.0 (101) | 6.5 (2.9) |
| 10 | 3/4 - 1¼ | W7077A6920 | W7077C6331 | W7077C6332 | 10 | 12.1 (307) | 3.9 (99) | 4.0 (101) | 8.5 (3.8) |
| 20 | 1¼ - 1½ | W7077A8901 | W7077C8331 | W7077C8332 | 22 | 16.5 (417) | 5.6 (142) | 4.1 (104) | 15.3 (6.9) |

* Sub-base not included. See pages 28-30 for sub-bases, manifolds and accessories.

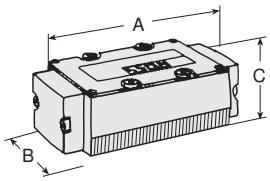
**STANDARD SPECIFICATIONS** (for valves on this page)**:**
**Solenoids:** AC or DC power.
**Standard Voltages:** See page 108; consult ROSS.
**Power Consumption:** Each solenoid.
*Size 1 models:* 10 VA inrush, 9 VA holding on 50 or 60 Hz; 5 watts on DC.
*All other sizes:* 87 VA inrush, 30 VA holding on 50 or 60 Hz; 14 watts on DC.

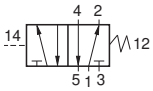
**Indicator Light:** Size 4, 10 & 20 models only.
**Ambient Temperature:** 40°F to 120°F (4°C to 50°C).
**Media Temperature:** 40° to 175°F (4° to 80°C).
**Flow Media:** Filtered air; 5 micron recommended.
**Inlet Pressure:** Vacuum to 150 psig (10 bar).
**Pilot Pressure:**
*Size 1 & 20 models:* At least 30 psig (2 bar).
*Size 2.5, 4 &10 models:* At least 15 psig (1 bar).

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

# Spool & Sleeve Valves for ANSI Sub-Bases Series W70

## 5/2 Valves – Single Pressure Controlled, Spring Return

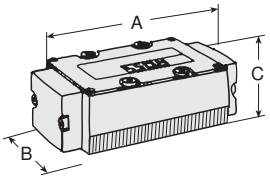


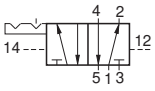




| ANSI Size | Range of Port Sizes | Valve Model Number* | Avg. $C_v$ | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|
| 1 | 1/4 - 3/8 | W7056B2331 | 1.0 | 5.1(128) | 2.0 (50) | 2.3 (58) | 2.5 (1.1) |
| 2.5 | 3/8 - 1/2 | W7056A3331 | 2.5 | 5.7 (145) | 2.6 (66) | 2.6 (66) | 2.0 (0.9) |
| 4 | 3/8 - 3/4 | W7056B4331 | 4.2 | 6.9 (174) | 3.5 (88) | 2.8 (70) | 4.3 (1.9) |
| 10 | 3/4 - 1¼ | W7056A6331 | 10 | 8.3 (211) | 3.9 (99) | 2.7 (68) | 6.3 (2.8) |
| 20 | 1¼ - 1½ | W7056A8331 | 22 | 13.5 (342) | 5.6 (142) | 3.0 (76) | 13.0 (5.9) |

* Sub-base not included. See pages 28-30 for sub-bases, manifolds and accessories.

## 5/2 Valves – Double Pressure Controlled, Detented

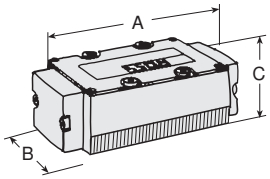


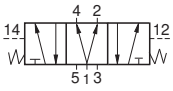




| ANSI Size | Range of Port Sizes | Valve Model Number* | Avg. $C_v$ | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|
| 1 | 1/4 - 3/8 | W7056B2332 | 1.0 | 5.1(128) | 2.0 (50) | 2.3 (58) | 2.5 (1.1) |
| 2.5 | 3/8 - 1/2 | W7056A3332 | 2.5 | 5.7 (145) | 2.6 (66) | 2.6 (66) | 2.0 (0.9) |
| 4 | 3/8 - 3/4 | W7056B4332 | 4.2 | 6.9 (174) | 3.5 (88) | 2.8 (70) | 4.3 (1.9) |
| 10 | 3/4 - 1¼ | W7056A6332 | 10 | 8.3 (211) | 3.9 (99) | 2.7 (68) | 6.3 (2.8) |
| 20 | 1¼ - 1½ | W7056A8332 | 22 | 13.5 (342) | 5.6 (142) | 3.0 (76) | 13.8 (6.2) |

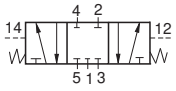
* Sub-base not included. See pages 28-30 for sub-bases, manifolds and accessories.

## 5/3 Valves – Double Pressure Controlled

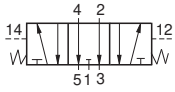



**Power Center**




**Closed Center**




**Open Center**

| ANSI Size | Range of Port Sizes | Valve Model Number* Power Center | Closed Center | Open Center | Avg. $C_v$ | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 1/8 - 3/8 | – | W7057B2331 | W7057B2332 | 1.0 | 5.1(128) | 2.0 (50) | 2.3 (58) | 2.5 (1.1) |
| 2.5 | 3/8 - 1/2 | – | W7057A3331 | W7057A3332 | 2.5 | 5.7 (145) | 2.6 (66) | 2.6 (66) | 2.0 (0.9) |
| 4 | 1/2 - 3/4 | – | W7057B4331 | W7057B4332 | 4.2 | 6.9 (174) | 3.5 (88) | 2.8 (70) | 4.5 (2.0) |
| 10 | 3/4 - 1¼ | W7057A6902 | W7057A6331 | W7057A6332 | 10 | 8.3 (211) | 3.9 (99) | 2.7 (68) | 6.3 (2.8) |
| 20 | 1¼ - 1½ | – | W7057A8331 | W7057A8332 | 22 | 13.5 (342) | 5.6 (142) | 3.0 (76) | 13.8 (6.2) |

* Sub-base not included. See pages 28-30 for sub-bases, manifolds and accessories.

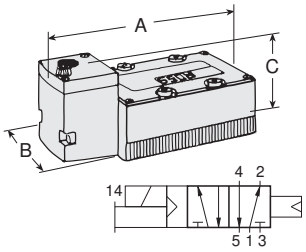
**STANDARD SPECIFICATIONS** (for valves on this page)**:**
**Ambient Temperature:** 40° to 175°F (4° to 80°C).
**Flow Media:** Filtered air; 5 micron recommended.
**Inlet Pressure:** Vacuum to 150 psig (10 bar).

**Pilot Pressure:**
Size *1 & 20 models:* At least 30 psig (2 bar).
*Size 2.5, 4 & 10 models:* At least 15 psig (1 bar).

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

# Poppet Valves for ANSI Sub-Bases Series W74

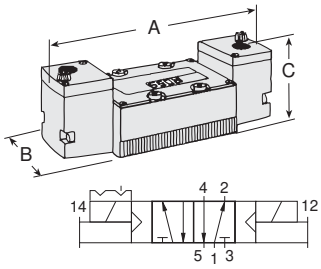
## 5/2 Valves – Single Solenoid Pilot Controlled, Air Return




| ISO Size | Range of Port Sizes | Valve Model Number* Std. Temp. | High Temp. | Avg. $C_v$ | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|---|
| 1 | 1/4 - 3/8 | W7476B2331 | W7476B2336 | 0.9 | 6.5 (164) | 2.0 (50) | 2.4 (59) | 3.0 (1.4) |
| 2.5 | 3/8 - 1/2 | W7476A3331 | W7476A3336 | 2.0 | 7.3 (185) | 2.7 (67) | 3.6 (91) | 3.0 (1.4) |
| 4 | 3/8 - 3/4 | W7476C4331 | W7476B4336 | 4.2 | 8.4 (212) | 3.5 (88) | 4.0 (101) | 5.0 (2.3) |
| 10 | 3/4 - 1¼ | W7476A6331 | W7476A6336 | 11 | 9.8 (249) | 3.9 (99) | 4.0 (101) | 6.1 (2.8) |
| 20 | 1¼ - 1½ | W7476A8331 | W7476A8336 | 22 | 15.0 (381) | 5.6 (142) | 4.1 (104) | 18.5 (8.3) |

* Sub-base not included. See pages 28-30 for sub-bases, manifolds and accessories.

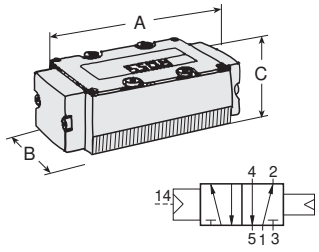
## 5/2 Valves – Double Solenoid Pilot Controlled, Detented




| ISO Size | Range of Port Sizes | Valve Model Number* Std. Temp. | High Temp. | Avg. $C_v$ | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|---|
| 1 | 1/4 - 3/8 | W7476B2332 | W7476B2337 | 0.9 | 7.7 (194) | 2.0 (50) | 2.4 (59) | 3.5 (1.6) |
| 2.5 | 3/8 - 1/2 | W7476A3332 | W7476A3337 | 2.0 | 8.8 (224) | 2.7 (67) | 3.6 (91) | 4.0 (1.8) |
| 4 | 3/8 - 3/4 | W7476C4332 | W7476C4337 | 4.2 | 9.8 (249) | 3.5 (88) | 4.0 (101) | 5.5 (2.5) |
| 10 | 3/4 - 1¼ | W7476A6332 | W7476A6337 | 11 | 11.3 (286) | 3.9 (99) | 4.0 (101) | 10.8 (4.9) |
| 20 | 1¼ - 1½ | W7476A8332 | W7476A8337 | 22 | 16.5 (417) | 5.6 (142) | 4.1 (104) | 19.8 (8.9) |

* Sub-base not included. See pages 28-30 for sub-bases, manifolds and accessories.

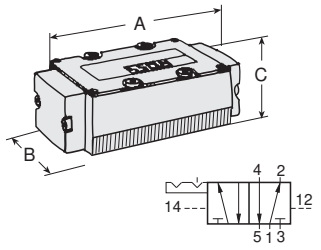
## 5/2 Valves – Single Pressure Controlled, Air Return




| ISO Size | Range of Port Sizes | Valve Model Number* Std. Temp. | High Temp. | Avg. $C_v$ | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|---|
| 1 | 1/4 - 3/8 | W7456B2331 | W7456B2336 | 0.9 | 5.1 (128) | 2.0 (50) | 2.3 (58) | 2.5 (1.1) |
| 2.5 | 3/8 - 1/2 | W7456A3331 | W7456A3336 | 2.0 | 5.7 (145) | 2.6 (66) | 2.6 (66) | 2.0 (0.9) |
| 4 | 3/8 - 3/4 | W7456C4331 | W7456C4336 | 4.2 | 6.9 (174) | 3.5 (88) | 2.8 (70) | 3.3 (1.5) |
| 10 | 3/4 - 1¼ | W7456A6331 | W7456A6336 | 11 | 8.3 (211) | 3.9 (99) | 2.7 (68) | 7.3 (3.3) |
| 20 | 1¼ - 1½ | W7456A8331 | W7456A8336 | 22 | 13.5 (342) | 5.6 (142) | 3.0 (76) | 17.5 (7.9) |

* Sub-base not included. See pages 28-30 for sub-bases, manifolds and accessories.

## 5/2 Valves – Double Pressure Controlled, Detented




| ISO Size | Range of Port Sizes | Valve Model Number* Std. Temp. | High Temp. | Avg. $C_v$ | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|---|
| 1 | 1/4 - 3/8 | W7456B2332 | W7456B2337 | 0.9 | 5.1 (128) | 2.0 (50) | 2.3 (58) | 2.5 (1.1) |
| 2.5 | 3/8 - 1/2 | W7456A3332 | W7456A3337 | 2.0 | 5.7 (145 | 2.6 (66) | 2.6 (66) | 2.0 (0.9) |
| 4 | 3/8 - 3/4 | W7456C4332 | W7456C4337 | 4.2 | 6.9 (174) | 3.5 (88) | 2.8 (70) | 3.3 (1.5) |
| 10 | 3/4 - 1¼ | W7456A6332 | W7456A6337 | 11 | 8.3 (211) | 3.9 (99) | 2.7 (68) | 7.3 (3.3) |
| 20 | 1¼ - 1½ | W7456A8332 | W7456A8337 | 22 | 13.5 (342) | 5.6 (142) | 3.0 (76) | 17.5 (7.9) |

* Sub-base not included. See pages 28-30 for sub-bases, manifolds and accessories.

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

***Solenoid Pilot Controlled:***

**Solenoids:** AC or DC power.
**Standard Voltages:** See page 108; consult ROSS.
**Power Consumption:** Each solenoid.
*Size 1 models:* 10 VA inrush, 9 VA holding on 50 or 60 Hz; 5 watts on DC.
*All other sizes:* 87 VA inrush, 30 VA holding on 50 or 60 Hz; 14 watts on DC.**ndicator Light:** Size 4, 10 & 20 models only.
**Ambient Temperature:** 40° to 120°F (4° to 50°C); extended to 175°F (80°C) for High Temperature models.

***Pressure Controlled:***

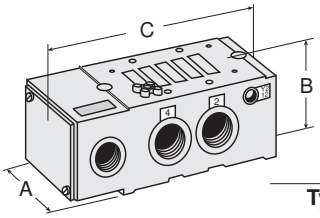
**Ambient Temperature:** 40° to 175°F (4° to 80°C).

***Common Specifications:***

**Media Temperature:** 40° to 175°F (4° to 80°C); extended to 220°F (105°C) for High Temperature models.
**Flow Media:** Filtered air.
**Inlet Pressure:** 30 to 150 psig (2 to 10 bar).
**Pilot Pressure:** Must be equal to or greater than inlet pressure.

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

# Sub-Bases for ANSI Valves Series W70 & W74




**Sub-base for $C_v$ = 4.2 valves illustrated.**

The sub-base numbers shown in the chart below specify pressure ports with NPT threads, and electrical openings with 1/2 NPT threads.

**ANSI Sub-base Model Numbers**

| Type of Sub-Base | Outlet Port | Indicator Lights in Base* None | One | Two | Avg. $C_v$ | Dimensions inches (mm) A | B | C |
|---|---|---|---|---|---|---|---|---|
| Side-Ported | 1/4 | 500B91 | 525K91 | 526K91 | 0.9 to 1.0 | 2.8 (72) | 1.6 (41) | 6.2 (157) |
| | 3/8 | 501B91 | 527K91 | 528K91 | 0.9 to 1.0 | 2.8 (72) | 1.6 (41) | 6.2 (157 |
| | 3/8 | 474K91 | 482K91 | 484K91 | 2.0 to 2.5 | 3.6 (91) | 1.5 (37) | 7.1 (180) |
| | 1/2 | 475K91 | 483K91 | 485K91 | 2.0 to 2.5 | 3.6 (91) | 1.5 (37) | 7.1 (180) |
| | 3/8 | 361B91 | — | — | 4.2 | 3.3 (84) | 2.7 (67) | 7.2 (183) |
| | 1/2 | 362B91 | — | — | 4.2 | 3.3 (84) | 2.7 (67) | 7.2 (183) |
| | 3/4 | 363B91 | — | — | 4.2 | 3.3 (84) | 2.7 (67) | 7.2 (183) |
| | 3/4 | 364B91 | — | — | 10 to 11 | 5.1 (130) | 3.8 (96) | 10.5 (266) |
| | 1 | 365B91 | — | — | 10 to 11 | 5.1 (130) | 3.8 (96) | 10.5 (266) |
| | 1¼ | 366B91 | — | — | 10 to 11 | 5.1 (130) | 3.8 (96) | 10.5 (266) |
| | 1¼ | 367B91 | — | — | 22 | 6.4 (163) | 3.7 (94) | 12.4 (314) |
| | 1½ | 368B91 | — | — | 22 | 6.4 (163) | 3.7 (94) | 12.4 (314) |
| Side and Bottom-Ported | 1/4 | 499B91 | 529K91 | 530K91 | 0.9 to 1.0 | 2.8 (72) | 1.5 (37) | 6.2 (157) |
| | 3/8 | 476K91 | 477K91 | 486K91 | 2.0 to 2.5 | 3.6 (91) | 1.5 (37) | 7.1 (180) |
| | 3/8 | 369B91 | — | — | 4.2 | 3.4 (86) | 2.7 (67) | 7.2 (183) |
| | 1/2 | 370B91 | — | — | 4.2 | 3.4 (86) | 2.7 (67) | 7.2 (183) |
| | 3/4 | 371B91 | — | — | 4.2 | 3.4 (86) | 2.7 (67) | 7.2 (183) |
| Bottom-Ported | 3/4 | 372B91 | — | — | 10 to 11 | 5.1 (130) | 3.9 (99) | 10.5 (266) |
| | 1 | 373B91 | — | — | 10 to 11 | 5.1 (130) | 3.9 (99) | 10.5 (266) |
| | 1¼ | 374B91 | — | — | 10 to 11 | 5.1 (130) | 3.9 (99) | 10.5 (266) |
| | 1¼ | 375B91 | — | — | 22 | 6.4 (163) | 3.8 (98) | 12.4 (314) |
| | 1½ | 376B91 | — | — | 22 | 6.4 (163) | 3.8 (98) | 12.4 (314) |

*NPT port threads. For BSPP threads, add a "D" prefix to the model number; for JIS threads, add a "J" prefix to the model number, e.g., D500B91.

**Electrical connection conforming to ANSI standard B93.55M is available. For more information, refer to ROSS Bulletin 379B (form number A10090).**

# 3/2 Miniature Valves for Base Mounting Series W14

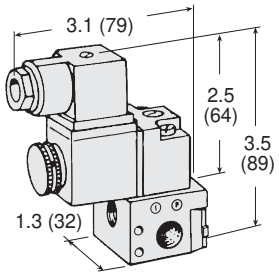
### VALVE MODEL NUMBERS

With locking manual override..... **W1413A1408**
With non-locking manual override ..... **W1413A1409**

Valve is shown with electrical connector and on a base. See page 18 for electrical connector.

**BASES:** 1/8 NPT ports threads. For BSPP threads, add a "D" prefix to the model number.

Sub-Base..... **516B91**
Manifold ..... **535K91**




**STANDARD SPECIFICATIONS** (for 3/2 Miniature valves)**:**
**$C_v$ Rating:** 0.1.
**Solenoids:** AC or DC power.
**Standard Voltages:** See page 108; consult ROSS.
**Power Consumption:** 8 VA inrush, 6 VA holding on 50 or 60 Hz; 6 watts on DC.
**Ambient Temperature:** 5° to 120°F (-15° to 50°C).
**Media Temperature:** 5° to 175°F (-15° to 80°C).
*For temperatures below 40°F (4°C) air must be free of water vapor to prevent formation of ice.*
**Flow Media:** Filtered air.
**Inlet Pressure:** Vacuum to 150 psig (10 bar).

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

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# Manifolds for ANSI Valves Series W70 & W74

The numbers of the manifold stations shown in the chart below specify pressure ports with NPT threads and electrical openings with 1¼ NPT threads.

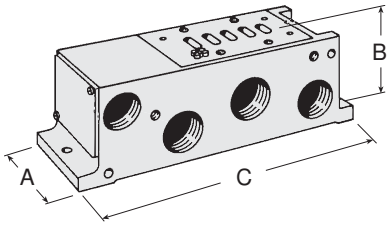
All necessary hardware and seals for manifold assembly are included with each manifold station.

**Indicator Lights:**

As shown in the chart below, the smaller sizes of manifolds are available with indicator lights. These lights are located in the end plate covering the electrical cavity.

**Manifold Note:**

The port positions of the solenoid controlled and the pressure controlled manifolds are not the same. For this reason these stations cannot be mixed in the same installation. If both types of valves *must* be used in the same installation, *use only manifold stations for solenoid controlled valves.*




**Typical Manifold Station**

## ANSI MANIFOLDS

| Type of Manifold | Outlet Port | Indicator Lights in Manifold* None | One** | Two** | Avg. $C_v$ | Dimensions inches (mm) A | B | C |
|---|---|---|---|---|---|---|---|---|
| For Solenoid Controlled Valves | 1/4 | 502B91 | 531K91 | 532K91 | 0.9 to 1.0 | 2.3 (57) | 2.3 (58) | 8.0 (205) |
| | 3/8 | 503B91 | 533K91 | 534K91 | 0.9 to 1.0 | 2.3 (57) | 2.3 (58) | 8.0 (205) |
| | 3/8 | 472K91 | 478K91 | 480K91 | 2.0 to 2.5 | 2.3 (57) | 2.3 (57) | 8.0 (205) |
| | 1/2 | 473K91 | 479K91 | 481K91 | 2.0 to 2.5 | 2.3 (57) | 2.3 (57) | 8.0 (205) |
| | 3/8 | 377B91 | — | — | 4.2 | 3.54 (90) | 3.7 (94) | 9.1 (232) |
| | 1/2 | 378B91 | — | — | 4.2 | 3.54 (90) | 3.7 (94) | 9.1 (232) |
| | 3/4 | 379B91 | — | — | 4.2 | 3.54 (90) | 3.7 (94) | 9.1 (232) |
| | 3/4 | 380B91 | — | — | 10 to 11 | 4.25 (108) | 4.1 (104) | 13.3 (338) |
| | 1 | 381B91 | — | — | 10 to 11 | 4.25 (108) | 4.1 (104) | 13.3 (338) |
| | 1¼ | 382B91 | — | — | 10 to 11 | 4.25 (108) | 4.1 (104) | 13.3 (338) |
| For Pressure Controlled Valves | 1/4 | 359B91 | — | — | 0.9 to 1.0 | 2.26 (57) | 2.3 (58) | 6.3 (160) |
| | 3/8 | 360B91 | — | — | 0.9 to 1.0 | 2.26 (57) | 2.3 (58) | 6.3 (160) |
| | 3/8 | 468B91 | — | — | 2.0 to 2.5 | 2.80 (71) | 2.7 (69) | 6.9 (174) |
| | 1/2 | 469B91 | — | — | 2.0 to 2.5 | 2.80 (71) | 2.7 (69) | 6.9 (174) |
| | 3/8 | 383B91 | — | — | 4.2 | 3.54 (90) | 3.7 (94) | 9.2 (232) |
| | 1/2 | 384B91 | — | — | 4.2 | 3.54 (90) | 3.7 (94) | 9.2 (232) |
| | 3/4 | 385B91 | — | — | 4.2 | 3.54 (90) | 3.7 (94) | 9.2 (232) |
| | 3/4 | 386B91 | — | — | 10 to 11 | 4.25 (108) | 4.1 (104) | 13.3 (338) |
| | 1 | 387B91 | — | — | 10 to 11 | 4.25 (108) | 4.1 (104) | 13.3 (338) |
| | 1¼ | 388B91 | — | — | 10 to 11 | 4.25 (108) | 4.1 (104) | 13.3 (338) |

*NPT port threads. For BSPP threads, add a "D" prefix to the model number; for JIS threads, add a "J" prefix to the model number.
** Specify voltage on manifold.
**Standard Voltages:** 24 volts DC; 110 volts AC, 50 Hz ; 120 volts AC, 60 Hz; 200 volts AC, 50 Hz; 240 volts AC, 60 Hz. For other voltages, consult ROSS.

## ASSEMBLED MANIFOLDS

Valves and manifold stations can be assembled by ROSS to precise specifications. The assembly is then ready for integration into your system.

For detailed information about such assemblies, consult your ROSS Distributor or call ROSS in the U.S.A. at 1-888-TEK-ROSS (835-7677) or 1-706-356-3708.

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

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# Accessories for ANSI Valves Series W70 & W74

## Interposed Pressure Regulators

Both single and double interposed regulators are available for valves with $C_V$ ratings up to 4.2. A regulator is bolted to the valve's sub-base or manifold station, and the valve is then bolted to the regulator. This mounting method allows the valve to be removed and replaced without disturbing the regulator.

Single pressure regulators provide the same regulated pressure at both outlet ports. Double pressure regulators allow the pressure at each outlet port to be set independently.

A locking type knob is used to set the regulated pressure at any point in the range of:

5 to 100 psig (0.3 to 7 bar) for size 1 and 2 models;
5 to 125 psig (0.3 to 8.5 bar) for size = 4.2 models.

Maximum inlet pressure is 150 psig (10 bar).
Pressure gauge(s) included.

Order regulators by the part numbers shown at the right.

| | Single | Double * Solenoid | Single Remote Air |
|---|---|---|---|
| $C_V$ = 0.9, Size 1 Valves: | **840C91** | **841C91** | **713C91** |
| $C_V$ = 2.0, Size 2.5 Valves: | **626C91** | **627C91** | **714C91** |
| $C_V$ = 4.2, Size 4 Valves: | **632C91** | **633C91** | **715C91** |

* Double regulator only for W70 spool valves.

**WARNING**
Double interposed regulators will reverse output ports - the 12 solenoid will pressurize the 4 port, the 14 solenoid will pressurize the 2 port - which may cause unexpected, potentially dangerous cylinder movement at valve pressurization.

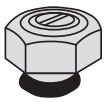
## Manual Override Kits for Solenoid Pilot Controlled Valves

Flush flexible manual overrides are standard on solenoid pilot controlled valves with $C_V$ ratings of 2.0 or larger. Both locking and non-locking metal override buttons are also available for these models.

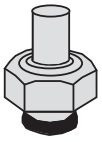
Each of the override buttons in the kits at the right is made of metal and is spring-returned. The locking type button, however, can be kept in the actuated position by turning the slot in the top of the button with a screwdriver.

Order by the kit numbers shown at the right.

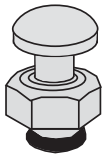
**FLUSH BUTTON**
Locking type ..... **Kit 792K87**
Non-locking type..... **Kit 790K87**



**EXTENDED BUTTON**
Non-locking type.....**Kit 791K87**



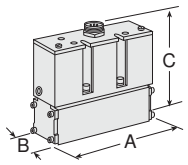
**EXTENDED BUTTON WITH PALM ACTUATOR**
Non-locking type.....**Kit 984H87**



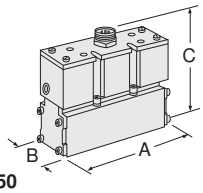
**IMPORTANT NOTE:** Please read carefully and thoroughly all of the **CAUTIONS** on the inside back cover.

# Spool & Sleeve Valves for SAE Sub-Bases Series 80

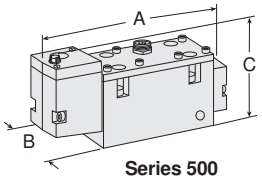
## 5/2 Spool Valves



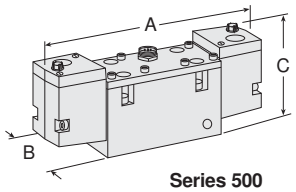
Series 125
Single or Double Solenoid



Series 250
Single or Double Solenoid



Series 500
Single Solenoid



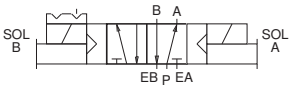
Series 500
Double Solenoid

**Valve Model Numbers (Base not included)**

| SAE Series | Type of Wiring Ford | Chrysler | Hardwire | Avg. $C_v$ | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|---|
| **Single Solenoid Pilot Valves** | | | | | | | | |
| 125 | 8076C3331 | 8076C3341 | 8076C3351 | 1.4 | 5.5 (140) | 1.8 (45) | 5.1 (129) | 3.5 (1.6) |
| 250 | 8076C4331 | 8076C4341 | 8076C4351 | 4.0 | 7.3 (185) | 2.6 (65) | 5.6 (142) | 6.5 (2.9) |
| 500 | 8076C6331 | 8076C6341 | 8076C6351 | 8.2 | 10.1 (257) | 3.0 (76) | 4.8 (121) | 8.3 (3.7) |
| **Double Solenoid Pilot Valves** | | | | | | | | |
| 125 | 8076C3332 | 8076C3342 | 8076C3352 | 1.4 | 5.5 (140) | 1.8 (45) | 5.1 (129) | 3.5 (1.6) |
| 250 | 8076C4332 | 8076C4342 | 8076C4352 | 4.0 | 7.3 (185) | 2.6 (65) | 5.6 (142) | 7.0 (3.2) |
| 500 | 8076C6332 | 8076C6342 | 8076C6352 | 8.0 | 11.2 (285) | 3.0 (76) | 4.8 (121) | 9.5 (4.3) |

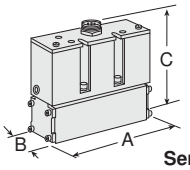
*Sub-bases and manifolds on pages 33-34.

Single Solenoid

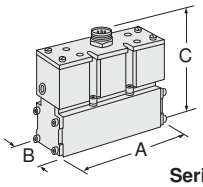


Double Solenoid

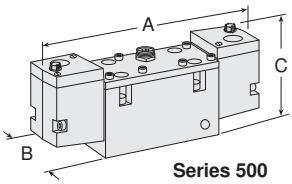
## 5/3 Spool Valves



Series 125



Series 250



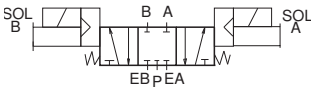
Series 500
Double Solenoid

**Valve Model Numbers (Base not included)**

| SAE Series | Type of Wiring Ford | Chrysler | Hardwire | Avg. $C_v$ | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|---|
| **Power Center Solenoid Pilot Valves** | | | | | | | | |
| 125 | 8077C3910 | 8077C3904 | – | 1.4 | 5.5 (140) | 1.8 (45) | 5.1 (129) | 3.5 (1.6) |
| 250 | 8077C4907 | 8077C4904 | – | 4.0 | 7.3 (185) | 2.6 (65) | 5.6 (142) | 6.5 (2.9) |
| **Open Center Solenoid Pilot Valves** | | | | | | | | |
| 125 | 8077C3332 | 8077C3342 | 8077B3352 | 1.4 | 5.5 (140) | 1.8 (45) | 5.1 (129) | 3.5 (1.6) |
| 250 | 8077C4332 | 8077C4342 | 8077B4352 | 4.0 | 7.3 (185) | 2.6 (65) | 5.6 (142) | 7.0 (3.2) |
| 500 | 8077C6332 | 8077C6342 | 8077B6352 | 8.0 | 12.0 (306) | 3.0 (76) | 4.8 (121) | 9.5 (4.3) |
| **Closed Center Solenoid Pilot Valves** | | | | | | | | |
| 125 | 8077C3331 | 8077C3341 | 8077B3351 | 1.4 | 5.5 (140) | 1.8 (45) | 5.1 (129) | 3.5 (1.6) |
| 250 | 8077C4331 | 8077C4341 | 8077B4351 | 4.0 | 7.3 (185) | 2.6 (65) | 5.6 (142) | 7.0 (3.2) |
| 500 | 8077C6331 | 8077C6341 | 8077B6351 | 8.0 | 12.0 (306) | 3.0 (76) | 4.8 (121) | 9.5 (4.3) |

*Sub-bases and manifolds on pages 33-34.

Power Center



Closed Center

Open Center

**STANDARD SPECIFICATIONS** (for valves on this page)**:**
**Solenoids:** AC or DC power. Rated for continuous duty.
**Standard Voltages:**
*Series 125, 250 models:* 100-110 volts, 50 Hz; 100-120 volts, 60 Hz; 24 volts DC; 110 volts DC. For other voltages, consult ROSS.
*Series 500 models:* 100-110 volts, 50 Hz; 100-120 volts, 60 Hz; 24 volts DC; 110 volts DC. For other voltages, consult ROSS.
**Power Consumption:** Each solenoid:
*Series 125, 250 models:* 8 VA inrush; 6 VA holding on 50/60 Hz; 8 watts on DC.
**Power Consumption:** Each solenoid:
*Series 500 models:* 87 VA inrush; 30 VA holding on 50/60 Hz; 14 watts on DC.
**Indicator Light:** One for each solenoid.
**Ambient Temperature:** 40° to 120°F (4° to 50°C).
**Media Temperature:** 40° to 175°F (4° to 80°C).
**Flow Media:** Filtered air; 5 micron recommended.
**Inlet Pressure:** Vacuum to 150 psig (10 bar).
**Pilot Pressure:** At least 15 psig (1 bar).
**Options:** Pressure Controlled Valves–Interposed Pressure Regulators.

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

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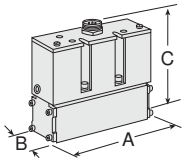
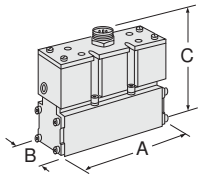
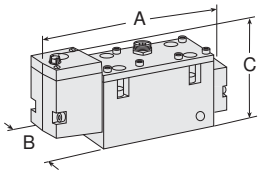
# Poppet Valves for SAE Sub-Bases Series 84



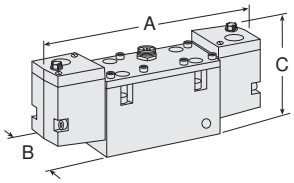

**Series 125**
**Single or Double Solenoid**



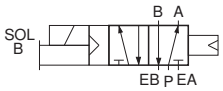

**Series 250**
**Single or Double Solenoid**



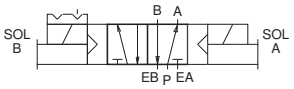

**Series 500**
**Single Solenoid**




**Series 500**
**Double Solenoid**




**Single Solenoid**




**Double Solenoid**

| SAE Series | Valve Model Numbers (Base not included) Type of Wiring Ford | Chrysler | Hardwire | Avg. $C_v$ | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|---|
| **Single Solenoid Pilot Valves** | | | | | | | | |
| 125 | 8476C3331 | 8476C3341 | 8476C3351 | 1.8 | 5.5 (140) | 1.8 (45) | 5.1 (129) | 2.8 (1.3) |
| 250 | 8476C4331 | 8476C4341 | 8476C4351 | 5.5 | 7.3 (185) | 2.6 (65) | 5.6 (142) | 5.2 (2.4) |
| 500 | 8476C6331 | 8476C6341 | 8476C6351 | 7.9 | 10.1(257) | 3.0 (76) | 4.8 (121) | 7.7 (3.5) |
| **Double Solenoid Pilot Valves** | | | | | | | | |
| 125 | 8476C3332 | 8476C3342 | 8476C3352 | 1.8 | 5.5 (140) | 1.8 (45) | 5.1 (129) | 3.3 (1.5) |
| 250 | 8476C4332 | 8476C4342 | 8476C4352 | 5.7 | 7.3 (185) | 2.6 (65) | 5.6 (142) | 5.7 (2.6) |
| 500 | 8476C6332 | 8476C6342 | 8476C6352 | 7.6 | 11.2 (285) | 3.0 (76) | 7.1 (180) | 8.9 (4.1) |

* Sub-bases and manifolds on pages 33-34.

**Interposed devices are also available, for more information, refer to Bulletin 376D (form number A10084).**

**IMPORTANT NOTE:**

The $C_v$ values given in the table above should not be used in comparing ROSS valves with those of other makers. These $C_v$ values are intended only for use with performance charts published by ROSS. The $C_v$ ratings in the chart above are averages for the various flow paths through the valve and are for steady flow conditions.

**STANDARD SPECIFICATIONS** (for valves on this page)**:**
**Solenoids:** AC or DC power. Rated for continuous duty.
**Standard Voltages:**
*Series 125, 250 models:* 100-110 volts, 50 Hz; 100-120 volts, 60 Hz; 24 volts DC; 110 volts DC. For other voltages, consult ROSS.
*Series 500 models:* 100-110 volts, 50 Hz; 100-120 volts, 60 Hz; 24 volts DC; 110 volts DC. For other voltages, consult ROSS.
**Power Consumption:** Each solenoid:
*Series 125, 250 models:* 8 VA inrush; 6 VA holding on 50/60 Hz; 8 watts on DC.
*Series 500 models:* 87 VA inrush; 30 VA holding on 50/60 Hz; 14 watts on DC.
**Indicator Light:** One for each solenoid.
**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 150 psig (10 bar).
**Pilot Pressure:** Must be equal to or greater than inlet pressure.
**Options:** Pressure Controlled Valves–Interposed Pressure Regulators.

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

# Sub-Bases for SAE Valves Series 80 & 84

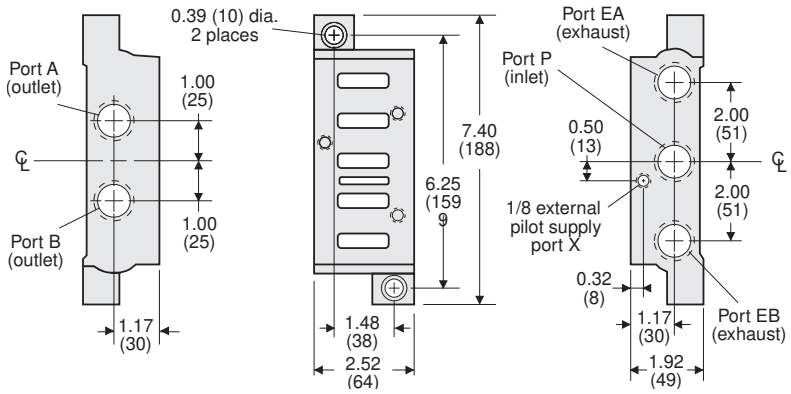
## Side-Ported

**Dimensions:** inches (mm)

### Series 125

| Sub-Base Number | Port Size* A, B | P, EA, EB |
|---|---|---|
| 577K91 | 1/8 | 1/4 |
| 578K91 | 1/4 | 3/8 |
| 579K91 | 3/8 | 3/8 |

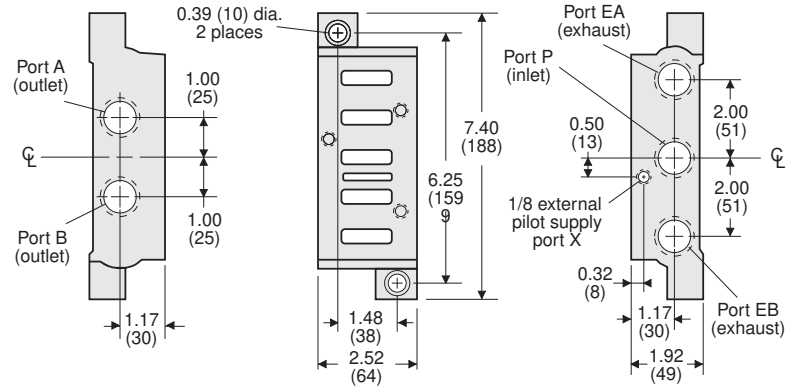
*NPT threads. For SAE threads, consult ROSS.




### Series 250

| Sub-Base Number | Port Size* A, B | P, EA, EB |
|---|---|---|
| 539K91 | 1/4 | 3/8 |
| 540K91 | 3/8 | 1/2 |
| 541K91 | 1/2 | 1/2 |
| 542K91 | 3/4 | 3/4 |

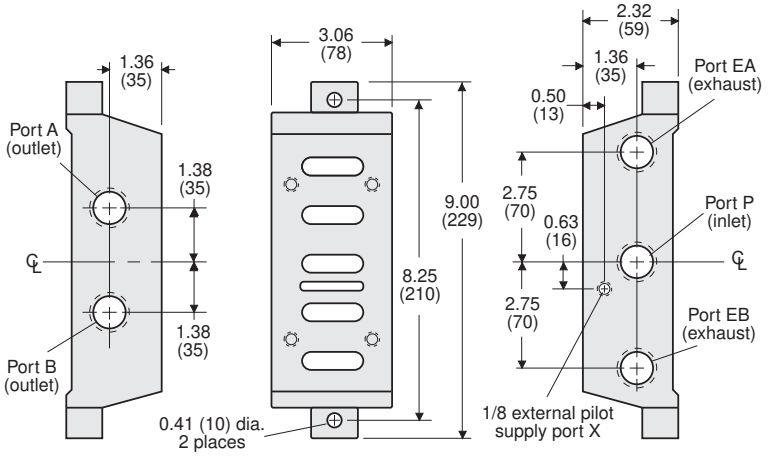
*NPT threads. For SAE threads, consult ROSS.




### Series 500

| Sub-Base Number | Port Size* A, B | P, EA, EB |
|---|---|---|
| 582K91 | 1/2 | 3/4 |
| 728K91 | 3/4 | 3/4 |
| 583K91 | 3/4 | 1 |
| 584K91 | 1 | 1 |

*NPT threads. For SAE threads, consult ROSS.



# Manifolds for SAE Valves Series 80 & 84

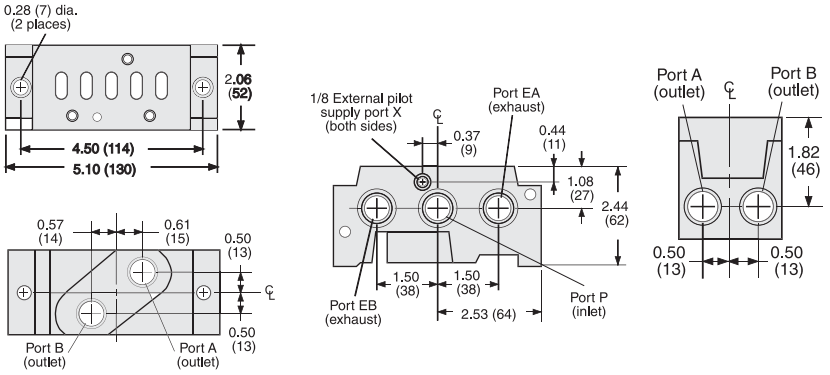
## Series 125 Manifold Stations

**Dimensions:** inches (mm)

| Station Number | Port Sizes* A, B | P, EA, EB |
|---|---|---|
| 580K91 | 1/4 | 3/8 |
| 581K91 | 3/8 | 3/8 |

*NPT threads. For SAE threads, consult ROSS.

**Blanking Plate:** For manifold stations not occupied by a valve, blanking plates are available. These plates block the unused air passages.
Order by part number **820K77.**

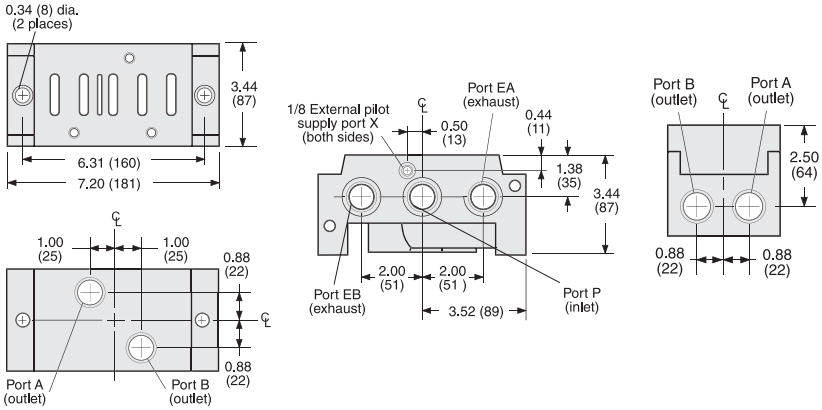



## Series 250 Manifold Stations

| Station Number | Port Sizes* A, B | P, EA, EB |
|---|---|---|
| 553K91 | 3/8 | 1/2 |
| 554K91 | 1/2 | 3/4 |
| 555K91 | 3/4 | 3/4 |

*NPT threads. For SAE threads, consult ROSS.

**Blanking Plate:** For manifold stations not occupied by a valve, blanking plates are available. These plates block the unused air passages.
Order by part number **821K77.**

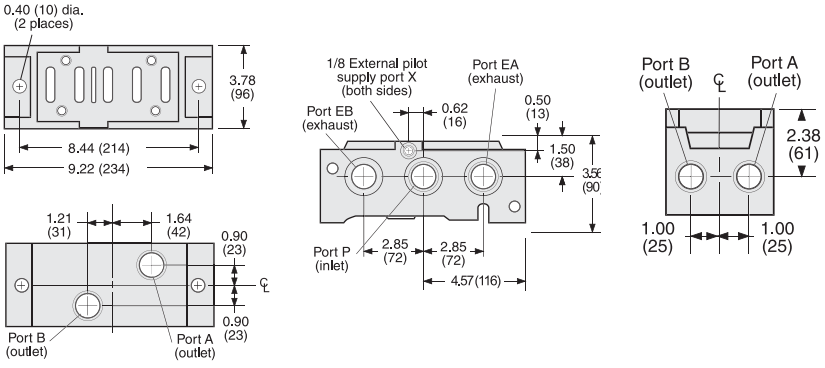



## Series 500 Manifold Stations

| Station Number | Port Sizes* A, B | P, EA, EB |
|---|---|---|
| 585K91 | 1/2 | 3/4 |
| 586K91 | 3/4 | 1 |
| 587K91 | 1 | 1 |

*NPT threads. For SAE threads, consult ROSS.

**Blanking Plate:** For manifold stations not occupied by a valve, blanking plates are available. These plates block the unused air passages.
Order by part number **822K77.**




Manifolds supplied with all necessary seals and hardware for assembly. End plates not required with these manifolds. Each station has all ports threaded to accept piping.

**Manual Override Kits for Series 500 Valves available. For more information, refer to Bulletin 376D (form number A10084).**

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

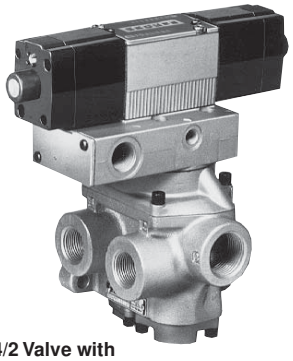
# Poppet Valves for Line Mounting Series 27

Series 27 Poppet valves for line mounting are available with single or double solenoid pilot control, or an air head for pressure control. Valve elements have end-guided stainless steel stems. Flush flexible manual override buttons are standard on solenoid models. Solenoid models listed in this catalog use an internal pilot supply. They are, however, easily field-convertible for use with an external pilot supply. Models for external pilot supply may also be ordered from ROSS.

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

To provide special control functions, most models are also available with the following **LOGICAIR®** adaptors.

**3/2 Valve with Single Solenoid Pilot Control**



**4/2 Valve with Double Solenoid Pilot Control**

## Timed Sequence Adaptor:

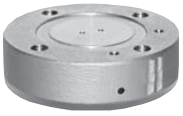
**Timed-Out Adaptor**

**Dual Timed Adaptor**

Allows the actuation and/or de-actuation of a valve to be delayed up to 30 seconds for 2/2 valves, and up to 3 seconds for 3/2 and 4/2 valves. The time delay function is controlled by a continuously adjustable tapered needle. Longer time delays can be obtained by using this adaptor in conjunction with the "Q" adaptor below.

## "PB" Adaptor:

Increases the actuating force on the valve piston by means of a supplementary piston. The "PB" adaptor should be used when the main valve supply pressure exceeds the available pilot or signal pressure. It should also be used when the pilot or signal pressure is less than the minimum specified for the valve. Air line lubrication required with this adaptor. For valves having this adaptor, please consult Ross.



**3-way PB Adaptor**

**4-way PB Adaptor**

## Air Index Adaptor:

Allows a pressure controlled or single solenoid pilot controlled valve to function as an impulse controlled, mechanically detented valve. A momentary signal shifts and holds the valve. A second momentary signal returns the valve to its original position. Air line lubrication required with this adaptor. For valves having this adaptor, please consult Ross.

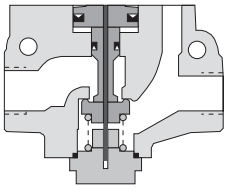
## "Q" Adaptor:

For use in conjunction with the timed sequence adaptor to extend the delay interval up to 60 seconds. It also helps to obtain "snap" action of the valve by keeping pilot or signal air off the main valve piston until the pressure has bui lt high enough to cause prompt valve response. Air line lubrication is required with this adaptor.

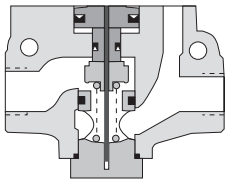
For additional information consult your ROSS distributor or call ROSS Technical Services in the U.S.A. at 1-888-TEK-ROSS (835-7677).

## Series 27 Valve Bodies

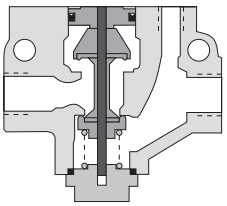
**FEATURES:** • Poppet construction for near zero leakage & high dirt tolerance • Self-cleaning • Wear compensating • Repeatability throughout the life of the valve



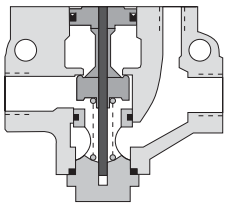
**2/2 Normally Closed**



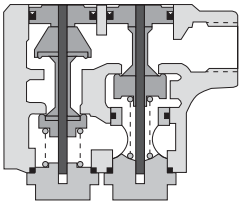
**2/2 Normally Open**



**3/2 Normally Closed**



**3/2 Normally Open**

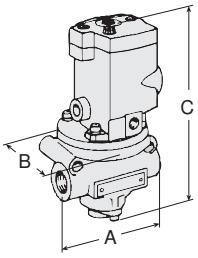


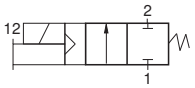
**4/2**

# Poppet Valves for Line Mounting Series 27

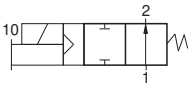
## Single Solenoid Pilot Controlled

### 2/2 Valves



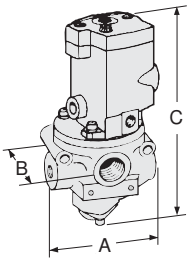

Normally Closed (NC)

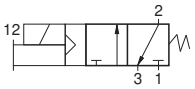



Normally Open (NO)

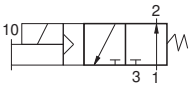
| Port Size | Valve Model Number NC | Valve Model Number NO | Avg. $C_v$ NC | Avg. $C_v$ NO | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|---|
| 1/4 | 2771B2001 | 2772B2001 | 2.3 | 2.3 | 3.6 (91) | 3.2 (79) | 6.9 (175) | 2.5 (1.2) |
| 3/8 | 2771B3001 | 2772B3001 | 3.8 | 3.3 | 3.6 (91) | 3.2 (79) | 6.9 (175) | 2.5 (1.2) |
| 1/2 | 2771B4011 | 2772B4011 | 4.0 | 3.5 | 3.6 (91) | 3.2 (79) | 6.9 (175) | 2.5 (1.2) |
| 1/2 | 2771B4001 | 2772B4001 | 7.7 | 6.5 | 4.6 (116) | 3.2 (79) | 7.6 (193) | 3.3 (1.5) |
| 3/4 | 2771B5001 | 2772B5001 | 9.0 | 7.3 | 4.6 (116) | 3.2 (79) | 7.6 (193) | 3.3 (1.5) |
| 1 | 2771B6011 | 2772B6011 | 9.0 | 7.9 | 4.6 (116) | 3.2 (79) | 7.6 (193) | 3.3 (1.5) |
| 1 | 2771B6001 | 2772B6001 | 24 | 21 | 6.7 (169) | 4.1 (104) | 10.4 (265) | 7.0 (3.2) |
| 1¼ | 2771B7001 | 2772B7001 | 29 | 20 | 6.7 (169) | 4.1 (104) | 10.4 (265) | 7.0 (3.2) |
| 1½ | 2771B8011 | 2772B8011 | 29 | 21 | 6.7 (169) | 4.1 (104) | 10.4 (265) | 7.0 (3.2) |
| 1½ | 2771B8001 | 2772B8001 | 49 | 49 | 8.7 (219) | 5.2 (131) | 11.8 (300) | 15.5 (6.9) |
| 2 | 2771B9001 | 2772B9001 | 57 | 57 | 8.7 (219) | 5.2 (131) | 11.8 (300) | 15.5 (6.9) |
| 2½ | 2771B9011 | 2772B9011 | 64 | 72 | 8.7 (219) | 5.2 (131) | 11.8 (300) | 15.5 (6.9) |

### 3/2 Valves



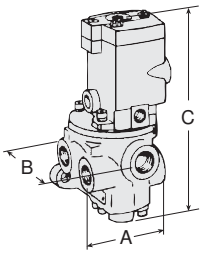

Normally Closed (NC)

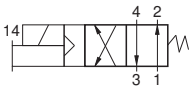



Normally Open (NO)

| Port Sizes In-Out | Port Sizes Exh. | Valve Model Number NC | Valve Model Number NO | Avg. $C_v$ NC | Avg. $C_v$ NO | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|---|---|
| 1/4 | 1/2 | 2773B2001 | 2774B2001 | 2.8 | 2.5 | 3.6 (91) | 3.2 (79) | 7.2 (182) | 2.5 (1.2) |
| 3/8 | 1/2 | 2773B3001 | 2774B3001 | 4.0 | 3.0 | 3.6 (91) | 3.2 (79) | 7.2 (182) | 2.5 (1.2) |
| 1/2 | 1/2 | 2773B4011 | 2774B4011 | 3.8 | 3.0 | 3.6 (91) | 3.2 (79) | 7.2 (182) | 2.5 (1.2) |
| 1/2 | 1 | 2773B4001 | 2774B4001 | 7.8 | 7.2 | 4.6 (116) | 3.6 (92) | 7.9 (201) | 3.3 (1.5) |
| 3/4 | 1 | 2773B5001 | 2774B5001 | 9.4 | 7.2 | 4.6 (116) | 3.6 (92) | 7.9 (201) | 3.3 (1.5) |
| 1 | 1 | 2773B6011 | 2774B6011 | 10 | 7.2 | 4.6 (116) | 3.6 (92) | 7.9 (201) | 3.3 (1.5) |
| 1 | 1½ | 2773B6001 | 2774B6001 | 29 | 21 | 6.7 (169) | 4.9 (123) | 10.4 (265) | 7.0 (3.2) |
| 1¼ | 1½ | 2773B7001 | 2774B7001 | 31 | 22 | 6.7 (169) | 4.9 (123) | 10.4 (265) | 7.0 (3.2) |
| 1½ | 1½ | 2773B8011 | 2774B8011 | 31 | 21 | 6.7 (169) | 4.9 (123) | 10.4 (265) | 7.0 (3.2) |
| 1½ | 2½ | 2773B8001 | 2774B8001 | 69 | 58 | 8.7 (219) | 6.4 (161) | 12.4 (313) | 16.5 (7.4) |
| 2 | 2½ | 2773B9001 | 2774B9001 | 70 | 60 | 8.7 (219) | 6.4 (161) | 12.4 (313) | 16.5 (7.4) |
| 2½ | 2½ | 2773B9011 | 2774B9011 | 71 | 55 | 8.7 (219) | 6.4 (161) | 12.4 (313) | 16.5 (7.4) |

### 4/2 Valves




| Port Sizes In-Out | Port Sizes Exh. | Valve Model Number | Avg. $C_v$ | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|
| 1/4 | 1/2 | 2776B2001 | 2.5 | 4.0 (100) | 3.9 (97) | 7.2 (182) | 3.0 (1.4) |
| 3/8 | 1/2 | 2776B3001 | 3.6 | 4.0 (100) | 3.9 (97) | 7.2 (182) | 3.0 (1.4) |
| 1/2 | 1/2 | 2776B4011 | 3.7 | 4.0 (100) | 3.9 (97) | 7.2 (182) | 3.0 (1.4) |
| 1/2 | 1 | 2776B4001 | 6.9 | 4.7 (118) | 5.3 (135) | 9.0 (228) | 5.3 (2.4) |
| 3/4 | 1 | 2776B5001 | 8.2 | 4.7 (118) | 5.3 (135) | 9.0 (228) | 5.3 (2.4) |
| 1 | 1 | 2776B6011 | 8.9 | 4.7 (118) | 5.3 (135) | 9.0 (228) | 5.3 (2.4) |
| 1 | 1½ | 2776B6001 | 23 | 6.5 (166) | 8.3 (211) | 10.7 (271) | 11.3 (5.1) |
| 1¼ | 1½ | 2776B7001 | 24 | 6.5 (166) | 8.3 (211) | 10.7 (271) | 11.3 (5.1) |
| 1½ | 1½ | 2776B8011 | 25 | 6.5 (166) | 8.3 (211) | 10.7 (271) | 11.3 (5.1) |

**STANDARD SPECIFICATIONS** (for valves on this page)**:**
**Solenoids:** AC or DC power.
**Standard Voltages:** See page 108; consult ROSS.
**Power Consumption:** 87 VA inrush, 30 VA holding on 50 or 60 Hz; 14 watts on DC.
**Ambient Temperature:** 40° to 120°F (4° to 50°C).
**Media Temperature:** 40° to 175°F (4° to 80°C).

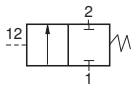
**Flow Media:** Filtered air.
**Inlet Pressure:** *1/4 to 1½ Port Sizes:* 15 to 150 psig (1 to 10 bar); *1½ to 2½ Port Sizes:* 30 to 150 psig (2 to 10 bar).
**Pilot Pressure:** When external supply is used, pressure must be equal to or greater than inlet pressure.
**Threads:** Model numbers above specify NPT pressure port threads. For other threads, see page 108.

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

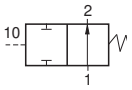
# Poppet Valves for Line Mounting Series 27

## Single Pressure Controlled

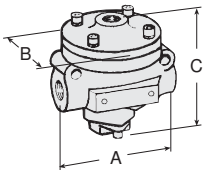
### 2/2 Valves



Normally Closed (NC)

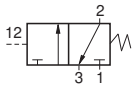


Normally Open (NO)

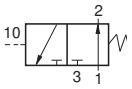



| Port Size | Valve Model Number NC | Valve Model Number NO | Avg. $C_v$ NC | Avg. $C_v$ NO | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|---|
| 1/4 | 2751A2001 | 2752A2001 | 2.3 | 2.3 | 3.6 (91) | 3.2 (79) | 3.8 (95) | 1.3 (0.6) |
| 3/8 | 2751A3001 | 2752A3001 | 3.8 | 3.3 | 3.6 (91) | 3.2 (79) | 3.8 (95) | 1.3 (0.6) |
| 1/2 | 2751A4011 | 2752A4011 | 4.0 | 3.5 | 3.6 (91) | 3.2 (79) | 3.8 (95) | 1.3 (0.6) |
| 1/2 | 2751A4001 | 2752A4001 | 7.7 | 6.5 | 4.6 (116) | 3.2 (79) | 4.5 (113) | 2.0 (0.9) |
| 3/4 | 2751A5001 | 2752A5001 | 9.0 | 7.3 | 4.6 (116) | 3.2 (79) | 4.5 (113) | 2.0 (0.9) |
| 1 | 2751A6011 | 2752A6011 | 9.0 | 7.9 | 4.6 (116) | 3.2 (79) | 4.5 (113) | 2.0 (0.9) |
| 1 | 2751A6001 | 2752A6001 | 24 | 21 | 6.7 (169) | 4.1 (104) | 7.5 (190) | 8.0 (3.6) |
| 1¼ | 2751A7001 | 2752A7001 | 29 | 20 | 6.7 (169) | 4.1 (104) | 7.5 (190) | 8.0 (3.6) |
| 1½ | 2751A8011 | 2752A8011 | 29 | 21 | 6.7 (169) | 4.1 (104) | 7.5 (190) | 8.0 (3.6) |
| 1½ | 2751A8001 | 2752A8001 | 49 | 49 | 8.7 (219) | 5.2 (131) | 9.0 (228) | 14.3 (6.4) |
| 2 | 2751A9001 | 2752A9001 | 57 | 57 | 8.7 (219) | 5.2 (131) | 9.0 (228) | 14.3 (6.4) |
| 2½ | 2751A9011 | 2752A9011 | 64 | 72 | 8.7 (219) | 5.2 (131) | 9.0 (228) | 14.3 (6.4) |

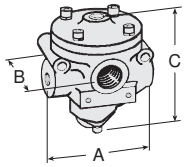
### 3/2 Valves



Normally Closed (NC)

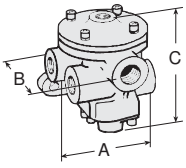


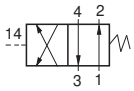
Normally Open (NO)




| Port Sizes In-Out | Port Sizes Exh. | Valve Model Number NC | Valve Model Number NO | Avg. $C_v$ NC | Avg. $C_v$ NO | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|---|---|
| 1/4 | 1/2 | 2753A2001 | 2754A2001 | 2.8 | 2.5 | 3.6 (91) | 3.2 (79) | 4.0 (101) | 1.3 (0.6) |
| 3/8 | 1/2 | 2753A3001 | 2754A3001 | 4.0 | 3.0 | 3.6 (91) | 3.2 (79) | 4.0 (101) | 1.3 (0.6) |
| 1/2 | 1/2 | 2753A4011 | 2754A4011 | 3.8 | 3.0 | 3.6 (91) | 3.2 (79) | 4.0 (101) | 1.3 (0.6) |
| 1/2 | 1 | 2753A4001 | 2754A4001 | 7.8 | 7.2 | 4.6 (116) | 3.6 (92) | 4.8 (121) | 2.0 (0.9) |
| 3/4 | 1 | 2753A5001 | 2754A5001 | 9.4 | 7.2 | 4.6 (116) | 3.6 (92) | 4.8 (121) | 2.0 (0.9) |
| 1 | 1 | 2753A6011 | 2754A6011 | 10 | 7.2 | 4.6 (116) | 3.6 (92) | 4.8 (121) | 2.0 (0.9) |
| 1 | 1½ | 2753A6001 | 2754A6001 | 29 | 21 | 6.7 (169) | 4.9 (123) | 7.5 (190) | 6.0 (2.7) |
| 1¼ | 1½ | 2753A7001 | 2754A7001 | 31 | 22 | 6.7 (169) | 4.9 (123) | 7.5 (190) | 6.0 (2.7) |
| 1½ | 1½ | 2753A8011 | 2754A8011 | 31 | 21 | 6.7 (169) | 4.9 (123) | 7.5 (190) | 6.0 (2.7) |
| 1½ | 2½ | 2753A8001 | 2754A8001 | 69 | 58 | 8.7 (219) | 6.4 (161) | 9.5 (241) | 15.3 (6.9) |
| 2 | 2½ | 2753A9001 | 2754A9001 | 70 | 60 | 8.7 (219) | 6.4 (161) | 9.5 (241) | 15.3 (6.9) |
| 2½ | 2½ | 2753A9011 | 2754A9011 | 71 | 55 | 8.7 (219) | 6.4 (161) | 9.5 (241) | 15.3 (6.9) |

### 4/2 Valves




| Port Sizes In-Out | Port Sizes Exh. | Valve Model Number | Avg. $C_v$ | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|
| 1/4 | 1/2 | 2756A2001 | 2.5 | 4.0 (100) | 3.9 (97) | 4.0 (101) | 1.8 (0.8) |
| 3/8 | 1/2 | 2756A3001 | 3.6 | 4.0 (100) | 3.9 (97) | 4.0 (101) | 1.8 (0.8) |
| 1/2 | 1/2 | 2756A4011 | 3.7 | 4.0 (100) | 3.9 (97) | 4.0 (101) | 1.8 (0.8) |
| 1/2 | 1 | 2756A4001 | 6.9 | 4.7 (118) | 5.3 (135) | 5.8 (147) | 4.3 (1.9) |
| 3/4 | 1 | 2756A5001 | 8.2 | 4.7 (118) | 5.3 (135) | 5.8 (147) | 4.3 (1.9) |
| 1 | 1 | 2756A6011 | 8.9 | 4.7 (118) | 5.3 (135) | 5.8 (147) | 4.3 (1.9) |
| 1 | 1½ | 2756A6001 | 23 | 6.5 (166) | 8.3 (211) | 7.5 (190) | 10.3 (4.6) |
| 1¼ | 1½ | 2756A7001 | 24 | 6.5 (166) | 8.3 (211) | 7.5 (190) | 10.3 (4.6) |
| 1½ | 1½ | 2756A8011 | 25 | 6.5 (166) | 8.3 (211) | 7.5 (190) | 10.3 (4.6) |

**STANDARD SPECIFICATIONS** (for valves on this page)**:**
**Ambient/Media Temperature:** 40° to 175°F (4° to 80°C).
**Flow Media:** Filtered air.
**Inlet Pressure:** *1/4 to 1½ Port Sizes:* 15 to 150 psig (1 to 10 bar).
*1½ to 2½ Port Sizes:* 30 to 150 psig (2 to 10 bar).
**Pilot Pressure:** Must be equal to or greater than inlet pressure.
**Threads:** Model numbers above specify NPT pressure port threads. For other threads, see page 108.

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

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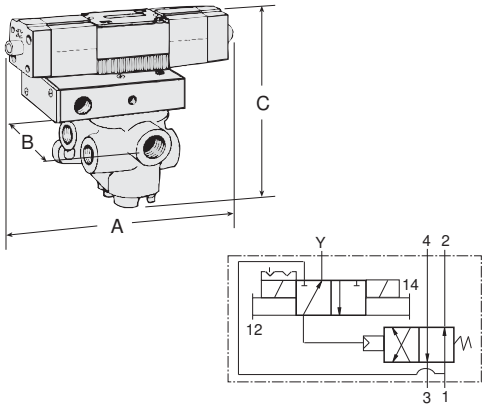
# Poppet Valves for Line Mounting Series 27

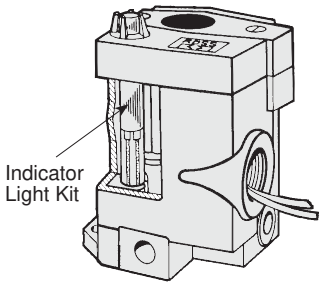
## 4/2 Valves – Double Direct Solenoid Controlled, Detented




| Port Sizes In-Out | Exh. | Valve Model Number | Avg. $C_v$ | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|
| 1/4 | 1/2 | 2776B2003 | 2.5 | 9.3 (236) | 3.9 (97) | 7.9 (201) | 4.0 (1.8) |
| 3/8 | 1/2 | 2776B3003 | 3.6 | 9.3 (236) | 3.9 (97) | 7.9 (201) | 4.0 (1.8) |
| 1/2 | 1/2 | 2776B4013 | 3.7 | 9.3 (236) | 3.9 (97) | 7.9 (201) | 4.0 (1.8) |
| 1/2 | 1 | 2776B4003 | 6.9 | 9.3 (236) | 5.3 (135) | 9.7 (246) | 6.3 (2.8) |
| 3/4 | 1 | 2776B5003 | 8.2 | 9.3 (236) | 5.3 (135) | 9.7 (246) | 6.3 (2.8) |
| 1 | 1 | 2776B6013 | 8.9 | 9.3 (236) | 5.3 (135) | 9.7 (246) | 6.3 (2.8) |
| 1 | 1½ | 2776B6003 | 23 | 9.3 (236) | 8.3 (211) | 11.6 (295) | 12.3 (5.5) |
| 1¼ | 1½ | 2776B7003 | 24 | 9.3 (236) | 8.3 (211) | 11.6 (295) | 12.3 (5.5) |
| 1½ | 1½ | 2776B8013 | 25 | 9.3 (236) | 8.3 (211) | 11.6 (295) | 12.3 (5.5) |

**STANDARD SPECIFICATIONS** (for valves listed above)**:**
**Solenoids:** AC or DC power.
**Standard Voltages:** See page 108; consult ROSS.
**Power Consumption:** Each solenoid; 190 VA inrush, 40 VA holding on 50 or 60 Hz; 20 watts on DC.
**Indicator Lights:** In each solenoid housing.
**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:** 15 to 150 psig (1 to 10 bar).
**Pilot Pressure:** If external supply is used, pressure must be equal to or greater than inlet pressure.
**Threads:** Model numbers above specify NPT pressure port threads. For other threads, see page 108.

## Indicator Light Kit




An indicator light extends through the solenoid or pilot cover and is illuminated when the solenoid is energized. Such lights are standard on double solenoid valves in Series 21 and 27.

An indicator light is available in kit form for single solenoid models in Series 16, Series 21 (type O only), and Series 27.

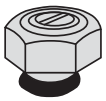
Order kit number **862K87** and specify the voltage of the solenoid.

## Manual Override Kits

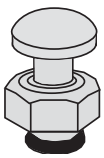
Flush flexible manual overrides are standard on single solenoid models in Series 16 and Series 27. Double solenoid models in Series 21 and 27 have flush metal-button overrides. Both types are non-locking.

Each of the buttons in the override kits below is made of metal and is spring-returned. The locking type button, however, can be kept in the actuated position by turning the slot in the top of the button with a screwdriver.

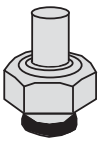
Order by the kit numbers shown below.



**FLUSH BUTTON**
Locking type .....**Kit 792K87**
Non-locking type.....**Kit 790K87**



**EXTENDED BUTTON WITH PALM ACTUATOR**
Non-locking type.....**Kit 984H87**



**EXTENDED BUTTON**
Non-locking type.....**Kit 791K87**

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

# Poppet Valves for Line Mounting Series 21

## High Temperature and Low Temperature Service

Series 21 valves are configured like the Series 27 valves, but are designed with metal internals and special seals appropriate for use in more extreme temperatures. The valves are designated as either Type H (High Temperature) or Type O (Low Temperature) valves. Temperature specifications for the two types are given below.

Solenoid models listed in this catalog use an internal pilot supply. They are, however, easily field-convertible for use with an external pilot supply. Models for external pilot supply may also be ordered from ROSS.

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

### Type H (High Temperature) Service:

Fluorocarbon seals are used to ensure high temperature stability.
*Ambient Temperature:* Up to 250°F (122°C) for solenoid models; up to 300°F (150°C) for pressure controlled models.
*Media Temperature:* 0° to 300°F (-17° to 150°C).

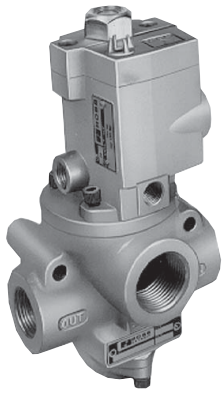
### Type O (Low Temperature) Service:

Buna-N seals are used to ensure good performance at low temperatures.
*Ambient Temperature:* Down to -40°F (-40°C).
*Media Temperature:* -40° to 175°F (-40° to 80°C).

### Vacuum Service:

The construction of Series 21 valves makes them readily adaptable to vacuum service.

For additional information consult your ROSS distributor or call ROSS Technical Services in the U.S.A. at 1-888-TEK-ROSS (835-7677).



**3/2 Valve with Single Solenoid Pilot**

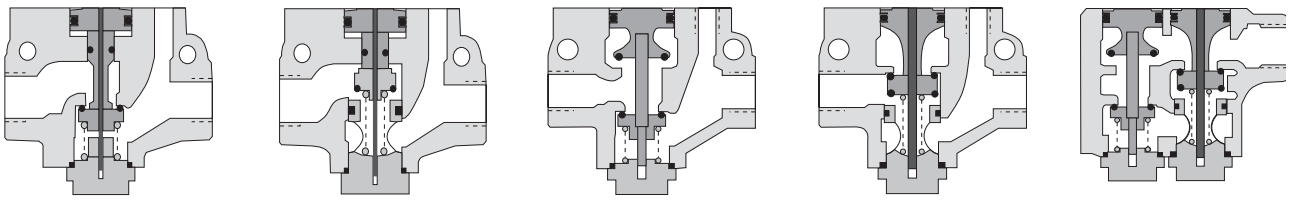
(Metal override button on top of pilot is standard on all single solenoid models.)

**FEATURES:**

- Poppet construction for near zero leakage & high dirt tolerance
- Self-cleaning
- Wear compensating
- Repeatability throughout the life of the valve

## Series 21 Valve Bodies

O-ring piston seals have PTFE wear rings top and bottom. Inlet and exhaust poppets have spun-in O-ring seals.



**2/2 Normally Closed** | **2/2 Normally Open** | **3/2 Normally Closed** | **3/2 Normally Open** | **4/2**

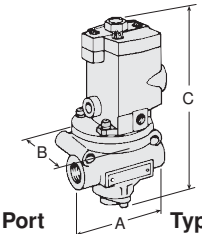
**STANDARD SPECIFICATIONS** (for valves on page 40)**:**
**Solenoids:** AC or DC power.
**Standard Voltages:** See page 108; consult ROSS.
**Power Consumption:** 87 VA inrush, 30 VA holding on 50 or 60 Hz; 14 watts on DC.
**Ambient Temperature:** *Type H:* 0° to 250°F (-17° to 122°C).
*Type O:* -40° to 120°F (-40° to 50°C).
**Media Temperature:** *Type H:* 0° to 300°F (-17° to 150°C).
*Type O:* -40° to 175°F (-40° to 80°C).
*For temperatures below 40°F (4°C) air must be free of water vapor to prevent formation of ice.*
**Flow Media:** Filtered air.
**Inlet Pressure:** 30 to 150 psig (2 to 10 bar).
**Pilot Pressure:** When external supply is used, pressure must be equal to or greater than inlet pressure.
**Threads:** Model numbers above specify NPT pressure port threads. For other threads, see page 108.
**Manual Override:** Non-locking metal button.

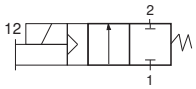
**IMPORTANT NOTE:** Please read carefully and thoroughly all of the **CAUTIONS** on the inside back cover.

# Poppet Valves for Line Mounting Series 21

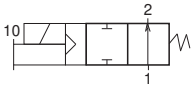
## Single Solenoid Pilot Controlled

### 2/2 Valves



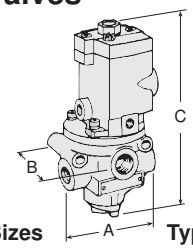

2/2 Normally Closed (NC)

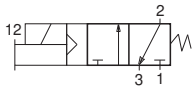



2/2 Normally Open (NO)

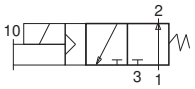
| Port Size | Valve Model Number Type H NC | Type H NO | Type O NC | Type O NO | Avg. $C_v$ NC | Avg. $C_v$ NO | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|---|---|---|
| 1/4 | 2171B2001 | 2172B2001 | 2171B2002 | 2172B2002 | 2.3 | 2.3 | 3.6 (90) | 3.0 (76) | 7.0 (178) | 3.0 (1.4) |
| 3/8 | 2171B3001 | 2172B3001 | 2171B3002 | 2172B3002 | 3.8 | 3.3 | 3.6 (90) | 3.0 (76) | 7.0 (178) | 3.0 (1.4) |
| 1/2 | 2171B4011 | 2172B4011 | 2171B4012 | 2172B4012 | 4.0 | 3.5 | 3.6 (90) | 3.0 (76) | 7.0 (178) | 3.0 (1.4) |
| 1/2 | 2171B4001 | 2172B4001 | 2171B4002 | 2172B4002 | 7.7 | 6.5 | 4.6 (116) | 3.0 (76) | 7.7 (196) | 3.3 (1.5) |
| 3/4 | 2171B5001 | 2172B5001 | 2171B5002 | 2172B5002 | 9.0 | 7.3 | 4.6 (116) | 3.0 (76) | 7.7 (196) | 3.3 (1.5) |
| 1 | 2171B6011 | 2172B6011 | 2171B6012 | 2172B6012 | 9.0 | 7.9 | 4.6 (116) | 3.0 (76) | 7.7 (196) | 3.3 (1.5) |
| 1 | 2171B6001 | 2172B6001 | 2171B6002 | 2172B6002 | 24 | 21 | 6.6 (168) | 4.1 (104) | 10.5 (266) | 7.5 (3.4) |
| 1¼ | 2171B7001 | 2172B7001 | 2171B7002 | 2172B7002 | 29 | 20 | 6.6 (168) | 4.1 (104) | 10.5 (266) | 7.5 (3.4) |
| 1½ | 2171B8011 | 2172B8011 | 2171B8012 | 2172B8012 | 29 | 21 | 6.6 (168) | 4.1 (104) | 10.5 (266) | 7.5 (3.4) |

### 3/2 Valves



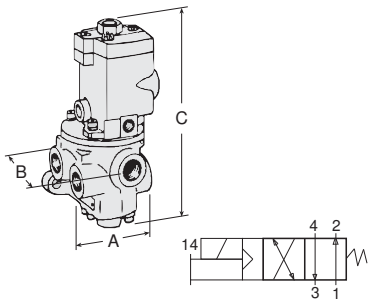

3/2 Normally Closed (NC)




3/2 Normally Open (NO)

| Port Sizes In-Out | Exh. | Valve Model Number Type H NC | Type H NO | Type O NC | Type O NO | Avg. $C_v$ NC | Avg. $C_v$ NO | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1/4 | 1/2 | 2173B2001 | 2174B2001 | 2173B2002 | 2174B2002 | 2.8 | 2.5 | 3.6 (90) | 3.6 (90) | 7.3 (186) | 3.0 (1.4) |
| 3/8 | 1/2 | 2173B3001 | 2174B3001 | 2173B3002 | 2174B3002 | 4.0 | 3.0 | 3.6 (90) | 3.6 (90) | 7.3 (186) | 3.0 (1.4) |
| 1/2 | 1/2 | 2173B4011 | 2174B4011 | 2173B4012 | 2174B4012 | 3.8 | 3.0 | 3.6 (90) | 3.6 (90) | 7.3 (186) | 3.0 (1.4) |
| 1/2 | 1 | 2173B4001 | 2174B4001 | 2173B4002 | 2174B4002 | 7.8 | 7.2 | 4.6 (116) | 4.6 (117) | 8.0 (203) | 3.3 (1.5) |
| 3/4 | 1 | 2173B5001 | 2174B5001 | 2173B5002 | 2174B5002 | 9.4 | 7.2 | 4.6 (116) | 4.6 (117) | 8.0 (203) | 3.3 (1.5) |
| 1 | 1 | 2173B6011 | 2174B6011 | 2173B6012 | 2174B6012 | 10 | 7.2 | 4.6 (116) | 4.6 (117) | 8.0 (203) | 3.3 (1.5) |
| 1 | 1½ | 2173B6001 | 2174B6001 | 2173B6002 | 2174B6002 | 29 | 21 | 6.6 (168) | 6.6 (168) | 10.5 (266) | 7.5 (3.4) |
| 1¼ | 1½ | 2173B7001 | 2174B7001 | 2173B7002 | 2174B7002 | 31 | 22 | 6.6 (168) | 6.6 (168) | 10.5 (266) | 7.5 (3.4) |
| 1½ | 1½ | 2173B8011 | 2174B8011 | 2173B8012 | 2174B8012 | 31 | 21 | 6.6 (168) | 6.6 (168) | 10.5 (266) | 7.5 (3.4) |

### 4/2 Valves




| Port Sizes In-Out | Exh. | Valve Model Number | | Avg. $C_v$ | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|---|
| 1/4 | 1/2 | 2176B2001 | 2176B2002 | 2.5 | 3.8 (97) | 7.7 (196) | 3.9 (99) | 3.0 (1.4) |
| 3/8 | 1/2 | 2176B3001 | 2176B3002 | 3.6 | 3.8 (97) | 7.7 (196) | 3.9 (99) | 3.0 (1.4) |
| 1/2 | 1/2 | 2176B4011 | 2176B4012 | 3.7 | 3.8 (97) | 7.7 (196) | 3.9 (99) | 3.0 (1.4) |
| 1/2 | 1 | 2176B4001 | 2176B4002 | 6.9 | 5.2 (132) | 9.7 (246) | 4.6 (104) | 5.8 (2.6) |
| 3/4 | 1 | 2176B5001 | 2176B5002 | 8.2 | 5.2 (132) | 9.7 (246) | 4.6 (104) | 5.8 (2.6) |
| 1 | 1 | 2176B6011 | 2176B6012 | 8.9 | 5.2 (132) | 9.7 (246) | 4.6 (104) | 5.8 (2.6) |
| 1 | 1½ | 2176B6001 | 2176B6002 | 23 | 8.2 (208) | 11.1 (282) | 6.5 (165) | 12.0 (5.4) |
| 1¼ | 1½ | 2176B7001 | 2176B7002 | 24 | 8.2 (208) | 11.1 (282) | 6.5 (165) | 12.0 (5.4) |
| 1½ | 1½ | 2176B8011 | 2176B8012 | 25 | 8.2 (208) | 11.1 (282) | 6.5 (165) | 12.0 (5.4) |

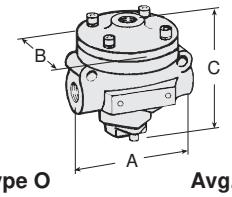
**STANDARD SPECIFICATIONS:** See page 39.

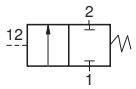
**IMPORTANT NOTE:** Please read carefully and thoroughly all of the **CAUTIONS** on the inside back cover.

# Poppet Valves for Line Mounting Series 21

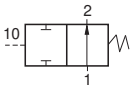
## Single Pressure Controlled

### 2/2 Valves



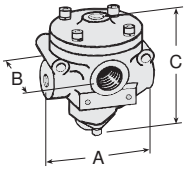

2/2 Normally Closed (NC)

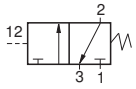



2/2 Normally Open (NO)

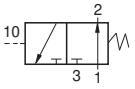
| Port Size | Valve Model Number Type H NC | Type H NO | Type O NC | Type O NO | Avg. $C_v$ NC | Avg. $C_v$ NO | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|---|---|---|
| 1/4 | 2151B2001 | 2152B2001 | 2151B2002 | 2152B2002 | 2.3 | 2.3 | 3.6 (90) | 3.7 (94) | 3.0 (94) | 1.8 (0.8) |
| 3/8 | 2151B3001 | 2152B3001 | 2151B3002 | 2152B3002 | 3.8 | 3.3 | 3.6 (90) | 3.7 (94) | 3.0 (94) | 1.8 (0.8) |
| 1/2 | 2151B4011 | 2152B4011 | 2151B4012 | 2152B4012 | 4.0 | 3.5 | 3.6 (90) | 3.7 (94) | 3.0 (94)) | 1.8 (0.8) |
| 1/2 | 2151B4001 | 2152B4001 | 2151B4002 | 2152B4002 | 7.7 | 6.5 | 4.6 (116) | 4.4 (112) | 3.0 (94) | 4.5 (2.0) |
| 3/4 | 2151B5001 | 2152B5001 | 2151B5002 | 2152B5002 | 9.0 | 7.3 | 4.6 (116) | 4.4 (112) | 3.0 (94) | 4.5 (2.0) |
| 1 | 2151B6011 | 2152B6011 | 2151B6012 | 2152B6012 | 9.0 | 7.9 | 4.6 (116) | 4.4 (112) | 3.0 (94) | 4.5 (2.0) |
| 1 | 2151B6001 | 2152B6001 | 2151B6002 | 2152B6002 | 24 | 21 | 6.6 (168) | 7.5 (190) | 4.1 (104) | 11.0 (5.0) |
| 1¼ | 2151B7001 | 2152B7001 | 2151B7002 | 2152B7002 | 29 | 20 | 6.6 (168) | 7.5 (190) | 4.1 (104) | 11.0 (5.0) |
| 1½ | 2151B8011 | 2152B8011 | 2151B8012 | 2152B8012 | 29 | 21 | 6.6 (168) | 7.5 (190) | 4.1 (104) | 11.0 (5.0) |

### 3/2 Valves



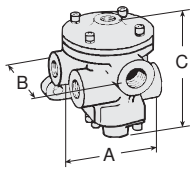

3/2 Normally Closed (NC)

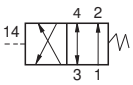



3/2 Normally Open (NO)

| Port Sizes In-Out | Exh. | Valve Model Number Type H NC | Type H NO | Type O NC | Type O NO | Avg. $C_v$ NC | Avg. $C_v$ NO | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1/4 | 1/2 | 2153B2001 | 2154B2001 | 2153B2002 | 2154B2002 | 2.8 | 2.5 | 3.6 (90) | 4.0 (101) | 3.1 (79) | 1.8 (0.8) |
| 3/8 | 1/2 | 2153B3001 | 2154B3001 | 2153B3002 | 2154B3002 | 4.0 | 3.0 | 3.6 (90) | 4.0 (101) | 3.1 (79) | 1.8 (0.8) |
| 1/2 | 1/2 | 2153B4011 | 2154B4011 | 2153B4012 | 2154B4012 | 3.8 | 3.0 | 3.6 (90) | 4.0 (101) | 3.1 (79) | 1.8 (0.8) |
| 1/2 | 1 | 2153B4001 | 2154B4001 | 2153B4002 | 2154B4002 | 7.8 | 7.2 | 4.6 (116) | 4.7 (120) | 3.6 (91) | 4.5 (2.0) |
| 3/4 | 1 | 2153B5001 | 2154B5001 | 2153B5002 | 2154B5002 | 9.4 | 7.2 | 4.6 (116) | 4.7 (120) | 3.6 (91) | 4.5 (2.0) |
| 1 | 1 | 2153B6011 | 2154B6011 | 2153B6012 | 2154B6012 | 10 | 7.2 | 4.6 (116) | 4.7 (120) | 3.6 (91) | 4.5 (2.0) |
| 1 | 1½ | 2153B6001 | 2154B6001 | 2153B6002 | 2154B6002 | 29 | 21 | 6.6 (168) | 7.5 (190) | 4.8 (123) | 11.0 (5.0) |
| 1¼ | 1½ | 2153B7001 | 2154B7001 | 2153B7002 | 2154B7002 | 31 | 22 | 6.6 (168) | 7.5 (190) | 4.8 (123) | 11.0 (5.0) |
| 1½ | 1½ | 2153B8011 | 2154B8011 | 2153B8012 | 2154B8012 | 31 | 21 | 6.6 (168) | 7.5 (190) | 4.8 (123) | 11.0 (5.0) |

### 4/2 Valves




| Port Sizes In-Out | Exh. | Valve Model Number | | Avg. $C_v$ | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|---|
| 1/4 | 1/2 | 2156B2001 | 2156B2002 | 2.5 | 3.8 (97) | 7.7 (196) | 3.9 (99) | 3.0 (1.4) |
| 3/8 | 1/2 | 2156B3001 | 2156B3002 | 3.6 | 3.8 (97) | 7.7 (196) | 3.9 (99) | 3.0 (1.4) |
| 1/2 | 1/2 | 2156B4011 | 2156B4012 | 3.7 | 3.8 (97) | 7.7 (196) | 3.9 (99) | 3.0 (1.4) |
| 1/2 | 1 | 2156B4001 | 2156B4002 | 6.9 | 5.2 (132) | 9.7 (246) | 4.6 (104) | 5.8 (2.6) |
| 3/4 | 1 | 2156B5001 | 2156B5002 | 8.2 | 5.2 (132) | 9.7 (246) | 4.6 (104) | 5.8 (2.6) |
| 1 | 1 | 2156B6011 | 2156B6012 | 8.9 | 5.2 (132) | 9.7 (246) | 4.6 (104) | 5.8 (2.6) |
| 1 | 1½ | 2156B6001 | 2156B6002 | 23 | 8.2 (208) | 11.1 (282) | 6.5 (165) | 12.0 (5.4) |
| 1¼ | 1½ | 2156B7001 | 2156B7002 | 24 | 8.2 (208) | 11.1 (282) | 6.5 (165) | 12.0 (5.4) |
| 1½ | 1½ | 2156B8011 | 2156B8012 | 25 | 8.2 (208) | 11.1 (282) | 6.5 (165) | 12.0 (5.4) |

**STANDARD SPECIFICATIONS** (for valves on this page)**:**
**Ambient/Media Temperatures:**
*Type H:* 0° to 300°F (-17° to 150°C).
*Type O:* -40° to 175°F (-40° to 80°C).
*For temperatures below 40°F (4°C) air must be free of water vapor to prevent formation of ice.*

**Flow Media:** Filtered air.
**Inlet Pressure:** 30 to 150 psig (2 to 10 bar).
**Pilot Pressure:** Must be equal to or greater than inlet pressure.
**Threads:** Model numbers above specify NPT pressure port threads. For other threads, see page 108.

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

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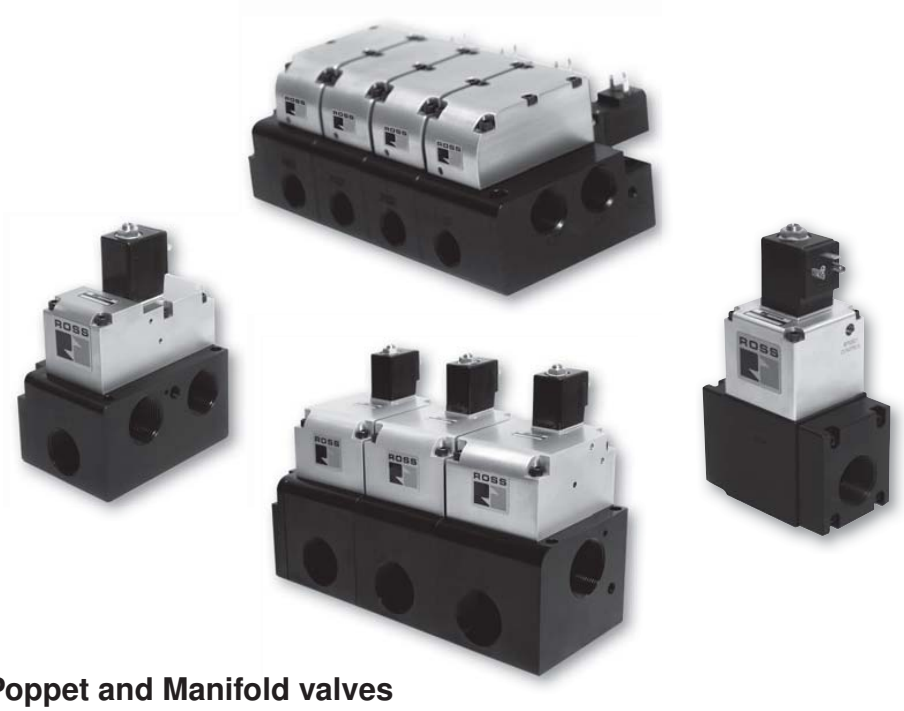
# Dale Series

## CP, CX, LF, LX & LT

### Manifold Compact Poppet Valves
### Inline Poppet Valves
### Leak Tight Valves & Manifolds

**For more information please refer to**

**BULLETIN 200**

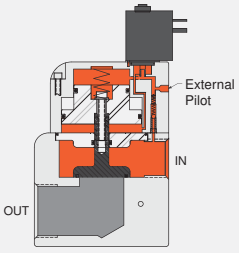


## Dale Series Poppet and Manifold valves

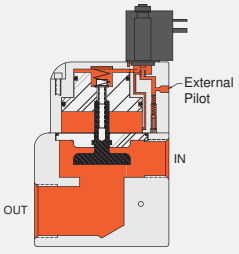
A high flow, compact design poppet and manifold valves, the Dale Series will complement ROSS' proven Series 21 and 27 poppet valves in applications requiring port pressure independence with compact manifold mounting. In addition, the Dale Series brings its experience in the vacuum and leak test proven applications.

**2/2 Normally Closed**

**1 - Valve Not Actuated**

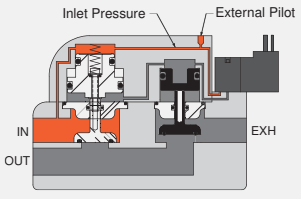



**2 - Valve Actuated**

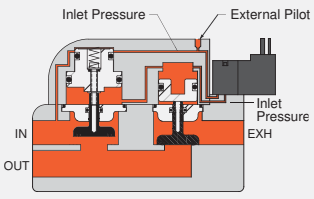



**3/2 Normally Closed**

**1 - Valve Not Actuated**



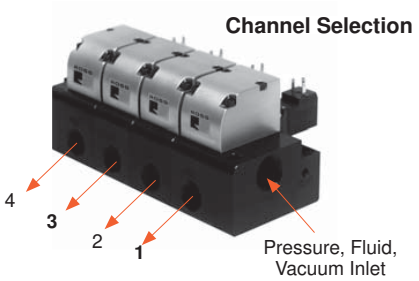

**2 - Valve Actuated**

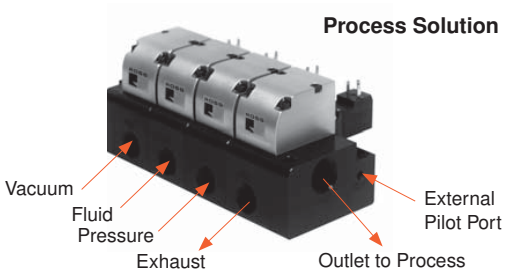



Please visit the ROSS web site to view the complete Bulletin 200 (Form #A10343) at www.rosscontrols.com.

# Poppet Valves Dale Series

## CP Manifold Series
**Function: 2/2**
**Port Size: 3/8" to 2½"**



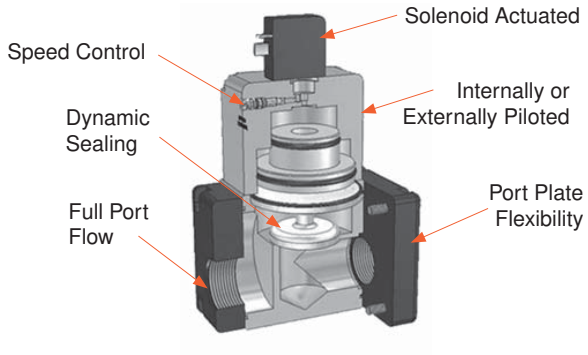

**Process Industry**
- Liquid Mixing applications
- Vacuum Fill applications
- Process Routing

**Vacuum Industry**
- Multi-million Life Cycles
- Leak Tight ($1x10^{-6}$ std. cc/sec.)
- Medium to Ultrahigh Vacuum

**General Automation**
- Improved Shift Speed
- Compact Cost Effective
- Ease of Repair

## LF Inline Series
**Function: 2/2**
**Port Size: 3/8" to 2½"**

**Target Market:**
**Diaphragm & Ball Valve**

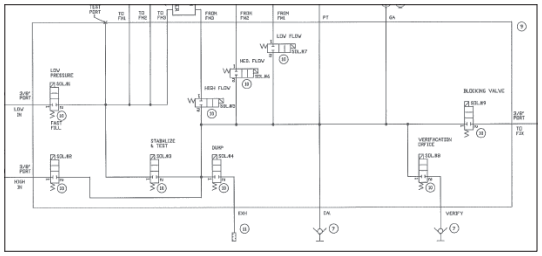



**Process Industry**
- Bi-directional Flow
- Adjustable Shift Speed Control
- Solenoid Actuated

**Vacuum Industry**
- Multi-million Life Cycles
- Leak Tight ($1x10^{-6}$ std. cc/sec.)
- Medium to Ultrahigh Vacuum

**General Automation**
- Improved Shift Speed
- Compact Cost Effective
- Ease of Repair

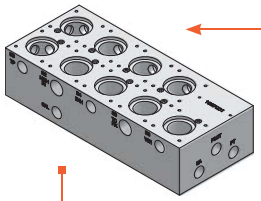
## *ROSS/FLEX® Expands with New Dale Series*

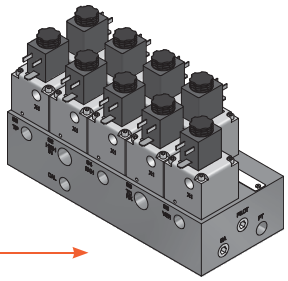


*(Circuit for illustration purposes only.)*

From Concept

To Design





To Rapid Delivery

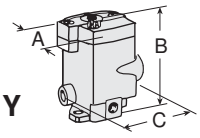
Utilizing the revolutionary new Dale cartridge style poppet valve the ROSS/FLEX® engineering team has greatly expanded their capabilities and deliveries for the most demanding applications. A cost effective manifold solution can greatly reduce assemble time, space required and trouble shooting in the field.

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

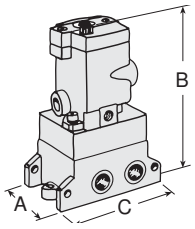
# Compact Valves Series 16

## Poppet Construction, Line or Manifold Mounting

### 3/2 Valves – Single Direct Solenoid

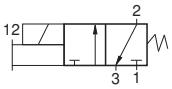



Y

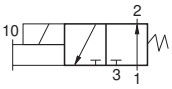



Z

**3/2 Normally Closed (NC)**




**3/2 Normally Open (NO)**




**For Line Mounting**

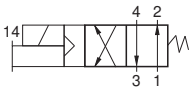
| Port Size | Valve Type | Valve Model Numbers NC | NO | Avg. $C_v$ | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|---|
| 1/8 | Y | 1613B1020 | 1614B1020 | 0.3 | 2.7 (69) | 3.8 (95) | 3.0 (77) | 1.4 (0.6) |
| 1/4 | Y | 1613B2020 | 1614B2020 | 0.3 | 2.7 (69) | 3.8 (95) | 3.0 (77) | 1.4 (0.6) |

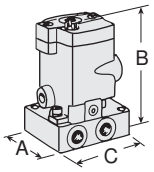
**For Manifold Mounting**

| Port Size | Valve Type | Valve Model Numbers NC | NO | Avg. $C_v$ | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|---|
| 1/4 | Z | 1613C2322* | 1614B2322* | 0.3 | 2.7 (69) | 6.6 (168) | 4.2 (107) | 1.4 (0.6) |

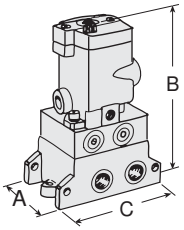
*Also order manifold **256B91** (not included with this valve).

### 4/2 Valves – Single Solenoid Pilot Controlled




Y




Z

**For Line Mounting**

| Port Size | Valve Type | Valve Model Number | Avg. $C_v$ | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|
| 1/4 | Y | 1616C2020 | 0.4 | 2.7 (69) | 4.8 (121) | 6.6 (168) | 2.4 (1.1) |

**For Manifold Mounting**

| Port Size | Valve Type | Valve Model Number | Avg. $C_v$ | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|
| 1/4 | Z | 1616C2322* | 0.4 | 2.7 (69) | 6.6 (168) | 4.2 (107) | 2.4 (1.1) |

*Also order manifold **257B91** (not included with this valve).

**STANDARD SPECIFICATIONS** (for valves on this page)**:**
**Solenoids:** AC or DC power.
**Standard Voltages:** See page 108; consult ROSS.
**Power Consumption:** 87 VA inrush, 30 VA holding on 50 or 60 Hz; 14 watts on DC.
**Ambient Temperature:** 40° to 120°F (4° to 50°F).
**Media Temperature:** 40° to 175°F (4° to 80°C).
**Flow Media:** Filtered air.
**Inlet Pressure:**
*3/2 Valves:* 5 to 150 psig (0.3 to 10 bar).
*4/2 Valves:* 30 to 150 psig (2 to 10 bar).

**Manual Override:** Flush flexible manual override (non-locking), standard.
**Port Treads:** NPT standard. For BSPP threads, add a “D” prefix to the model number; for J threads, add a “J” prefix to the model number.

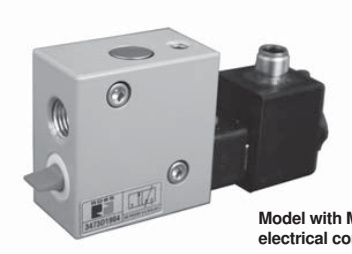
**Options:**
**Indicator Light:** Order kit number **862K87** and specify the voltage of the solenoid.
**Manual Override:** Metal button; see Manual Override Kits.

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

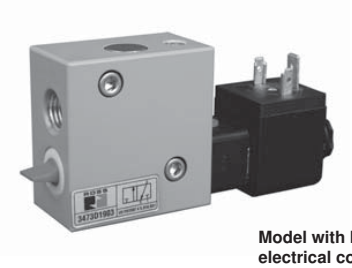
# NAMUR Interface Wash Down Service Valves

## 3/2, 5/2 Valves – Solenoid Pilot Controlled

**US Patent # 5,918,631**



Model with M12 Micro electrical connector shown



Model with DIN electrical connector shown

### FEATURES:

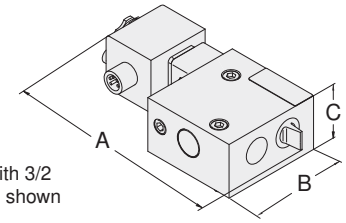
- "Duck-bill" protected exhaust port(s):
  - Limits wash down fluids from entering the valve
  - Minimizes the collection point for contamination
- Corrosion resistant epoxy powder coat
- Solenoid Pilot – Low wattage, fast shifting, repeatable, long life
- Patented Ball-poppet internals - Near zero internal leakage for the life of the valve, self cleaning valve seats, sure shifting
- Faster and more precise operation than a spool valve
- 3/2 Normally Closed and 5/2 Function

### APPLICATIONS:

- Designed for wash down application – Minimum collection point for contamination
- Ideal for food and beverage industries
- Process industries - Hot, cold, wet environments

| Valve Function | Valve Model Numbers* | Mounting Bolts | Connection | Avg. $C_v$ | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|---|
| 3/2 | 3473D1904W | 10-32 | M12 Micro | 0.25 | 4.62 (117.4) | 2.19 (55.50) | 1.2 (30.5) | 0.8 (0.3) |
| 3/2 | 3473D1900W | 10-32 | DIN 43650 form A | 0.25 | 4.62 (117.4) | 2.19 (55.50) | 1.2 (30.5) | 0.8 (0.3) |
| 5/2 | 3476C1904W | 10-32 | M12 Micro | 0.25 | 5.32 (135.2) | 2.19 (55.50) | 1.2 (30.5) | 0.9 (0.4) |
| 5/2 | 3476C1900W | 10-32 | DIN 43650 form A | 0.25 | 5.32 (135.2) | 2.19 (55.50) | 1.2 (30.5) | 0.9 (0.4) |

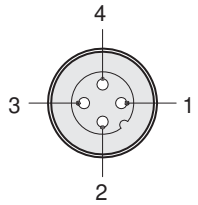
* W= 24 volts DC. For 110 volts AC, replace "W" with a "Z".
**Note:** 10-24 and M5 mounting bolts available upon request.




Model with 3/2 port size shown

M 12 Connector Pin Out

1 = N/C
2 = N/C
3 = BROWN (Positive)
4 = BLUE (Negative)




**STANDARD SPECIFICATIONS** (for valves on this page)**:**
**Solenoids:** AC or DC power.
**Standard Voltages:** See page 108; consult ROSS.
**Power Consumption:** 24 volts DC, 0.7 watt; 110-120 volts DC, 50/60 HZ.
**Ambient/Media Temperatures:**
4° to 122°F (-10° to 50°C).
*For temperatures below 40°F (4°C) air must be free of water vapor to prevent formation of ice.*

**Flow Media:** Filtered air.
**Inlet Pressure:** 29 to 116 psig (2 to 8 bar).
**Pilot Pressure:** Must be equal to or greater than inlet pressure.
**Threads:** Model numbers above specify NPT pressure port threads.

**Standard: NEMA 4X** (enclosure constructed for indoor or outdoor use to provide a degree of protection to personnel against incidental contact with the enclosed equipment; and also provides protection in highly corrosive environments.

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

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# Solenoid Pilot Valves Pak

ROSS® solenoid pilot valves provide reliable pilot control for various process valves: butterfly, knife gate, ball, mixing, diverters and other pneumatically actuated devices. With over 86 years of experience, ROSS' proven poppet valves deliver unsurpassed reliability.

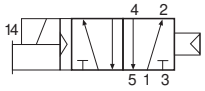
**Features:**
- Individual Valve Shut-off (automatic): increases uptime for continuous processing (see page 47 for details)
- Sure-Shifting and Self-Cleaning: reliable performance in extreme conditions (dirt tolerant, high humidity, cold, heat, dust, debris returned from the field actuator, etc...)
- Easily Accessible Manual Override (Yellow): turn to actuate, no tools needed
- Positive Sealing and Self-Compensating for Wear: perpendicular poppet face seals
- Quick Electrical Disconnect w/Indicator Light: allows immediate troubleshooting of component/system issues in the field.
- Consistent Actuation over the Life of the Valve: strong shifting forces
- Explosion Proof & Intrinsically Safe - options available, consult ROSS
- 8 & 16 Station Valve/Manifold: flying wire leads or central wiring option

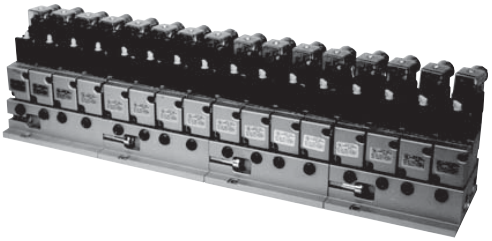
**Applications:**
- Power Generation
- Food & Beverage
- Petro-Chem
- Waste Water Treatment
- Aggregates
- Oil & Gas
- Pulp & Paper
- Pharmaceutical
- Household & Consumer Goods

## Extended-Duty Solenoid Pilot Controlled

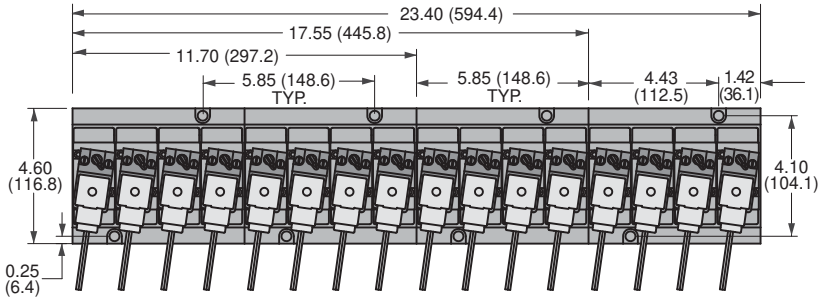
- Field Convertible: 5/2 and 3/2 Function (for dual or spring return actuators)

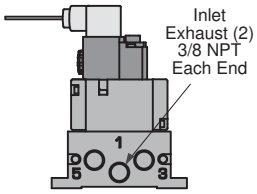
**Single Solenoid**

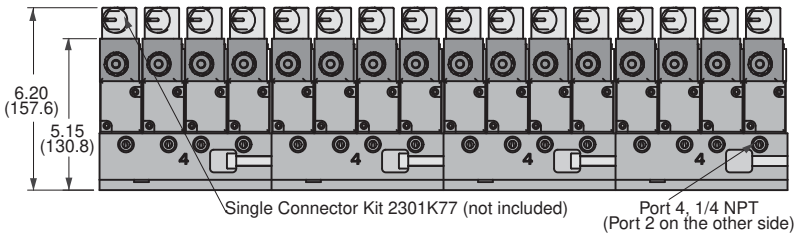


| Valve/Manifold Assembly | Standard Model Number |
|---|---|
| 4 Station | 3900A1052-1 |
| 8 Station | 3900A1052-2 |
| 12 Station | 3900A1052-3 |
| 16 Station | 3900A1052-4 |
| 20 Station and over | consult ROSS |
| Brass Swivel Fitting 1/4 NPT, 1/4 Tube | 270A27 |
| Electrical Connector w/10' leads | 2301K77 |
| Replacement Valve | 7476B1901 |




**STANDARD SPECIFICATIONS (**for valves on this page)**:**
**Solenoids:** Rated for continuous duty.
**Standard Voltages:** 110 volts 50/60 Hz; 24 volts DC. For other voltages, consult ROSS.
**Power Consumption:** 3.9 VA holding on 50/60 Hz; 2.1 watts on DC.
**Ambient Temperature:** 39° to 122°F (4° to 50°F).
**Media Temperature:** 39° to 175°F (4° to 80°C).
**Indicator Light:** In connector.
**Flow Media:** Filtered air.
**Inlet Pressure:** 30 to 150 psig (2 to 10 bar).
**Flow:** $C_v = 0.5$
**Certification:** by CSA according to UL 429 and CSA 22.2-139.

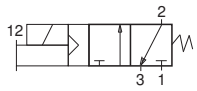
**IMPORTANT NOTE:** Please read carefully and thoroughly all of the **CAUTIONS** on the inside back cover.

# Solenoid Pilot Valves Pak

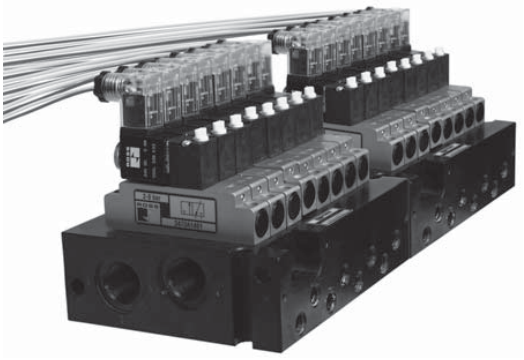
## Low-Power Solenoid Pilot Controlled

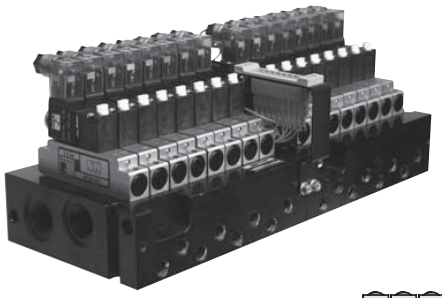
- 3/2 Function (4/2 Function consult ROSS)

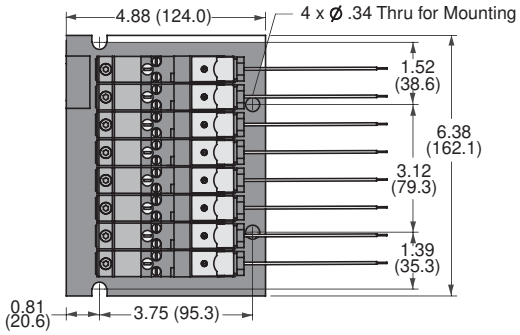
**3/2 Normally Closed**

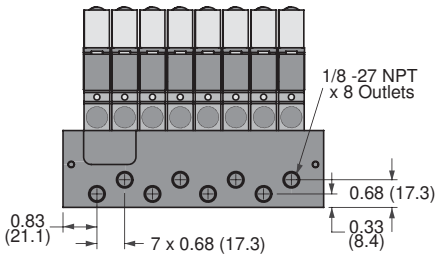


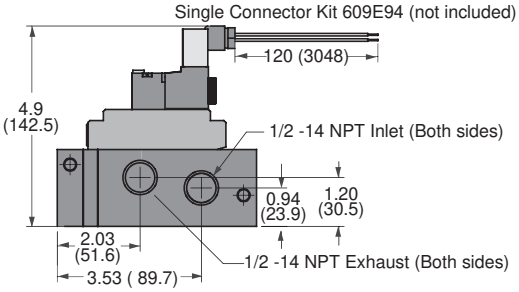

| Valve/Manifold Assembly | Standard Model Flying Leads | Central Wiring |
|---|---|---|
| 8 Station<br>16 Station<br>24 Station and over | 3900A0713-1<br>3900A0713-2<br>consult ROSS | 3900A1055-1<br>3900A1055-2<br>consult ROSS |
| Metal Swivel Fitting 1/8 NPT, 1/4 Tube | 322E27 | 322E27 |
| Electrical Connector w/10' leads | 609E94 | consult ROSS |
| Replacement Valve | 3473A1401 | 3473A1401 |





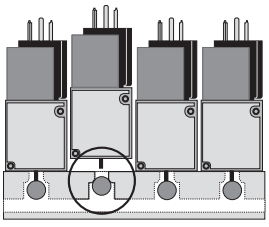



**Individual Valve Shut-off (automatic):** Individual valves can be removed without shutting off main air supply to the whole manifold or entire solenoid cabinet.

- Simply remove the valve and an internal check-ball automatically blocks inlet air to that station
- Inlet air is automatically restored to the station when the valve is returned

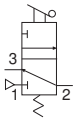


**STANDARD SPECIFICATIONS** (for valves on this page)**:**
**Solenoids:** Rated for continuous duty.
**Standard Voltages:** 110 volts 50/60 Hz; 24 volts DC. For other voltages, consult ROSS.
**Power Consumption:** 0.03 VA holding on 50/60 Hz; 0.8 watts on DC.
**Ambient Temperature:** 39° to 122°F (4° to 50°F).
**Media Temperature:** 39° to 175°F (4° to 80°C).
**Indicator Light:** In connector.
**Flow Media:** Filtered air.
**Inlet Pressure:** 30 to 150 psig (2 to 10 bar).
**Flow:** $C_v = 0.5$
**Certification:** by CSA according to UL 429 and CSA 22.2-139.

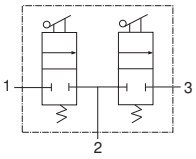
**IMPORTANT NOTE:** Please read carefully and thoroughly all of the **CAUTIONS** on the inside back cover.

# Pendant Control Valves

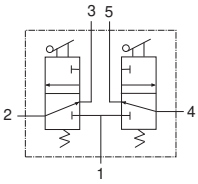
Single 3-way



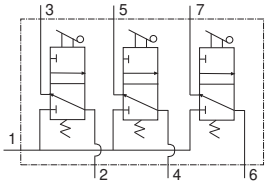

Dual 2-way




Dual 3-way



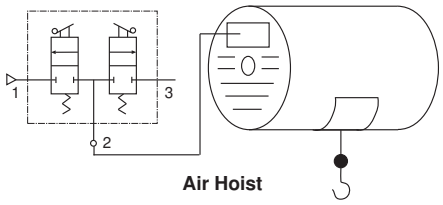

Triple 3-way



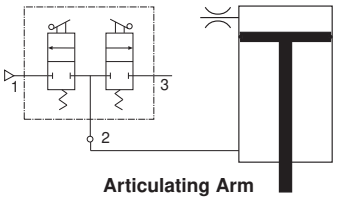

ROSS pendant control valves are a durable pneumatic solution that can be used anywhere manual control of devices is needed, such as an air hoist, air motor, or counterbalance cylinder. Ideal for use on or with material handling devices such as overhead cranes or air hoists, ROSS pendant control valves can withstand even the toughest environments.

## Application Data

### Dual 2/2 - High Flow

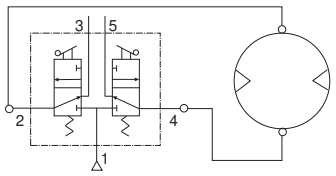



Air Hoist

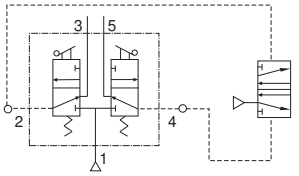



Articulating Arm

### Dual 3/2




Bi-directional Air Motor




Pilot for Larger Double Pressure Controlled Valve

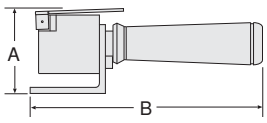
**To convert a Dual 3/2 into a Dual 2/2:**
Plug ports 3 and 5. Connect supply line to port 2.
Port 1 becomes the outlet and port 4 becomes the exhaust port.

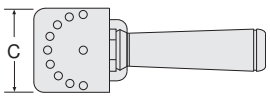
**Single 3/2 -** The Single 3/2 pendant control valve may be used anywhere that requires manual 3/2 control, such as operating small single acting cylinders or pressurizing vacuum cups for quick release. Ideal for use on or with material handling devices. Spring-return rubber poppet internals provide dependable shifting, long life, and low cost.

**Dual 2/2** - Ideal for use on or with material handling devices. Spring-return rubber poppet internals provide dependable shifting, long life, and low cost.

**Dual 3/2** - Ideal for use on or with material handling devices. Twin Pacer® inserts ensure reliability, dirt tolerance, and easy maintenance. May be used as a pilot valve convertible to a dual 2/2 function.

**Triple 3/2 -** The Triple 3/2 pendant control valve may be used anywhere that three independant manual outputs are needed. Provides remote pilot signals to pressure controlled valves. Three Pacer® inserts ensure reliability and dirt tolerance.



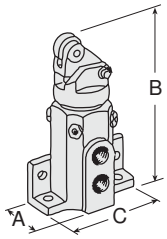

| Model Description | Pipe Size | Numbers | $C_v$ 1-2 | $C_v$ 2-3 | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|---|
| Single 3-way; one lever, no handle | 1/4” | 3900A1023 | 0.24 | 0.42 | 4.7 (120) | 6.0 (170) | 1.8 (46) | 1.0 (0.5) |
| Dual 2-way high flow; no levers/handle | 1/4” | 1443H75 | 0.73 | 0.55 | 3.1 (78) | 7.2 (182) | 2.8 (70) | 0.8 (0.4) |
| Dual 2-way high flow; two levers only | 1/4” | 2025A2901 | 0.73 | 0.55 | 3.1 (78) | 7.2 (182 | 2.8 (70) | 1.0 (0.5) |
| Dual 2-way high flow; two levers/handle | 1/4” | 3900A0378 | 0.73 | 0.55 | 3.1 (78) | 7.2 (182 | 2.8 (70) | 1.7 (0.8) |
| Dual 3-way; no levers/handle | 1/8” | 1442H75 | 0.24 | 0.42 | 2.9 (73) | 7.2 (182) | 2.8 (70) | 0.7 (0.3) |
| Dual 3-way; two levers only | 1/8” | 2025A1900 | 0.24 | 0.42 | 2.9 (73) | 7.2 (182) | 2.8 (70) | 0.9 (0.4) |
| Dual 3-way; two levers/handle | 1/8” | 3900A0379 | 0.24 | 0.42 | 2.9 (73) | 7.2 (182) | 2.8 (70) | 1.6 (0.7) |
| Triple 3-way; no levers/handle | 1/4” | 1466H75 | 0.24 | 0.42 | 2.8 (71) | 7.2 (182) | 2.8 (70) | 1.2 (0.5) |
| Triple 3-way; three levers only | 1/4” | 2025A2902 | 0.24 | 0.42 | 2.8 (71) | 7.2 (182) | 2.8 (70) | 1.6 (0.7) |
| Triple 3-way; three levers/handle | 1/4” | 3900A0407 | 0.24 | 0.42 | 2.8 (71) | 7.2 (182) | 2.8 (70) | 2.3 (1.0) |

**STANDARD SPECIFICATIONS** (for valves on this page)**:**
**Ambient Temperature:** 40° to 120°F (4° to 50°C).
**Media Temperature:** 40° to 175°F (4° to 50°C).
**Flow Media:** Filtered air.
**Inlet Pressure:** 0 to 150 psig (0 to 10 bar).

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

# Cam and Manual Valves Series 11 & 12

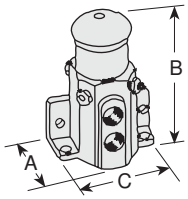
## 2/2 and 3/2 Cam Valves



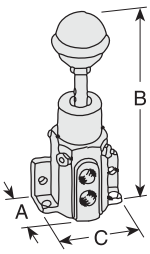


| Port Size | Valve Type | Valve Model Numbers | Avg. $C_v$ | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|
| 1/4 | 2/2 - Roller | 1131A2001 | 0.5 | 1.8 (46) | 4.4 (111) | 2.8 (70) | 1.0 (0.5) |
| 1/4 | 3/2 - Roller | 1133A2001 | 0.5 | 1.8 (46) | 4.4 (111) | 2.8 (70) | 1.0 (0.5) |
| 1/4 | 2/2 - 1-Way Roller | 1131A2002 | 0.5 | 1.8 (46) | 4.5 (114) | 2.8 (70) | 1.0 (0.5) |
| 1/4 | 3/2 - 1-Way Roller | 1133A2002 | 0.5 | 1.8 (46) | 4.5 (114) | 2.8 (70) | 1.0 (0.5) |

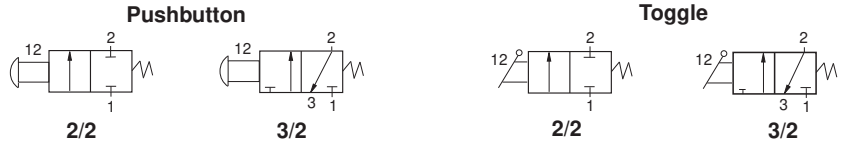
## 2/2 and 3/2 Lever and Pushbutton Valves




Pushbutton

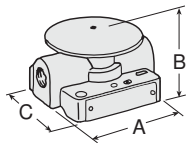



Toggle

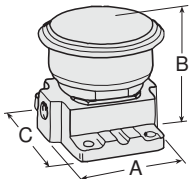



| Port Size | Valve Type | Valve Model Numbers | Avg. $C_v$ | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|
| 1/4 | 2/2 - Pushbutton | 1121A2001 | 0.5 | 1.8 (46) | 3.3 (83) | 2.8 (70) | 1.0 (0.5) |
| 1/4 | 3/2 - Pushbutton | 1123A2001 | 0.5 | 1.8 (46) | 3.3 (83) | 2.8 (70) | 1.0 (0.5) |
| 1/4 | 2/2 - Toggle | 1121A2002 | 0.5 | 1.8 (46) | 5.9 (150) | 2.8 (70) | 1.0 (0.5) |
| 1/4 | 3/2 - Toggle | 1123A2002 | 0.5 | 1.8 (46) | 5.9 (150) | 2.8 (70) | 1.0 (0.5) |

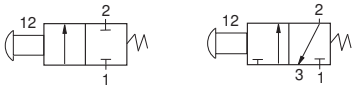
## 2/2 and 3/2 Pushbutton Valves




RD- Regular Duty




HD- Heavy Duty

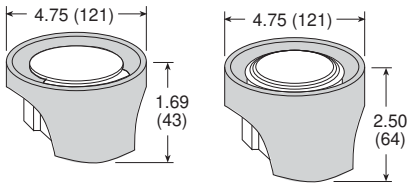



### Ring-type Guard:

Helps to protect against accidental valve actuation.
Ring guards are available for both button styles.

Order by following part numbers:
**For RD valves: 279B30**
**For HD valves: 278B30**

| Port Size | Valve Type | Valve Model Numbers Green Button | Red Button | Avg. $C_v$ | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|---|
| 1/8 | 3/2 - RD | 1223A1005 | 1223A1006 | 0.6 | 2.8 (70) | 1.6 (41) | 2.3 (58) | 1.0 (0.5) |
| 1/4 | 3/2 - RD | 1223A2005 | 1223A2006 | 0.6 | 2.8 (70) | 1.6 (41) | 2.3 (58) | 1.0 (0.5) |
| 1/4 | 2/2 - HD | 1221B2001 | 1221B2003 | 0.8 | 2.7 (69) | 2.3 (58) | 3.0 (77) | 1.8 (0.8) |
| 1/4 | 3/2 - HD | 1223B2001 | 1223B2003 | 0.8 | 2.7 (69) | 2.3 (58) | 3.0 (77) | 1.8 (0.8) |




RD valves: 279B30 HD valves: 278B30

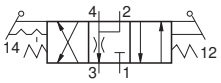
**STANDARD SPECIFICATIONS** (for valves on this page)**:**
**Ambient/Media Temperature:** 40° to 175°F (4° to 80 °C).
**Flow Media:** Filtered air.

**Inlet Pressure:** 5 to 150 psig (0.3 to 10 bar) except Type RD; 5 to 125 psig (0.3 to 8.6 bar) on Type RD.

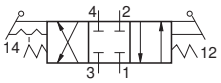
**IMPORTANT NOTE:** Please read carefully and thoroughly all of the **CAUTIONS** on the inside back cover.

# Manual Valves Series 31 & 36

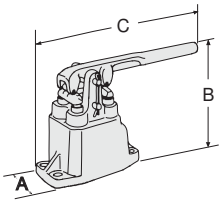
## 4/3 Lever Valves



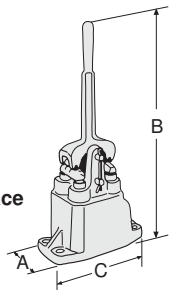
Open Center



Closed Center



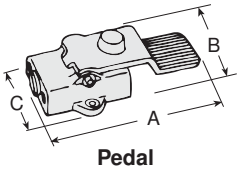
3 Positions,
All Ports on Bottom Face



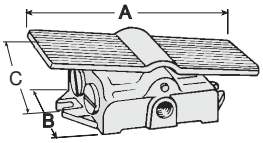

| Port Size | Valve Model Numbers | Avg. $C_v$ | Closed/Open Center | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|
| 3/8 | 3126A3007 | 1.6 | Open | 2.1 (54) | 4.4 (112) | 8.1 (205) | 2.0 (0.9) |
| 3/8 | 3126A3010 | 1.6 | Closed | 2.1 (54) | 4.4 (112) | 8.1 (205) | 2.0 (0.9) |
| 1/2 | 3126A4007 | 2.6 | Open | 2.8 (70) | 5.5 (140) | 11.2 (284) | 3.8 (1.7) |
| 1/2 | 3126A4010 | 2.6 | Closed | 2.8 (70) | 5.5 (140) | 11.2 (284) | 3.8 (1.7) |
| 3/4 | 3126A5007 | 4.6 | Open | 3.3 (83) | 6.2 (156) | 12.5 (317) | 5.0 (2.3) |
| 3/4 | 3126A5010 | 4.6 | Closed | 3.3 (83) | 6.2 (156) | 12.5 (317) | 5.0 (2.3) |
| 1 | 3126A6007 | 8.8 | Open | 4.1 (105) | 8.0 (202) | 18.6 (473) | 10.0 (4.5) |
| 1 | 3126A6010 | 8.8 | Closed | 4.1 (105) | 8.0 (202) | 18.6 (473) | 10.0 (4.5) |
| 1¼ | 3126A7007 | 12 | Open | 4.8 (121) | 8.2 (207) | 18.8 (476) | 11.0 (5.0) |
| 1¼ | 3126A7010 | 12 | Closed | 4.8 (121) | 8.2 (207) | 18.8 (476) | 11.0 (5.0) |
| 3/8 | 3126A3009 | 1.6 | Open | 2.1 (54) | 10.8 (273) | 4.3 (109) | 2.4 (1.1) |
| 3/8 | 3126A3012** | 1.6 | Open | 2.1 (54) | 10.8 (273) | 4.3 (109) | 2.4 (1.1) |
| 3/8 | 3126A3013 | 1.6 | Closed | 2.1 (54) | 10.8 (273) | 4.3 (109) | 2.4 (1.1) |
| 3/8 | 3126A3014** | 1.6 | Closed | 2.1 (54) | 10.8 (273) | 4.3 (109) | 2.4 (1.1) |
| 1/2 | 3126A4009 | 2.6 | Open | 2.8 (70) | 13.5 (344) | 5.6 (143) | 4.8 (2.2) |
| 1/2 | 3126A4012** | 2.6 | Open | 2.8 (70) | 13.5 (344) | 5.6 (143) | 4.8 (2.2) |
| 1/2 | 3126A4013 | 2.6 | Closed | 2.8 (70) | 13.5 (344) | 5.6 (143) | 4.8 (2.2) |
| 1/2 | 3126A4014** | 2.6 | Closed | 2.8 (70) | 13.5 (344) | 5.6 (143) | 4.8 (2.2) |

** Non-detented models.

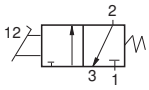
## 3/2, 4/2, 5/2 Pedal and Treadle Valves



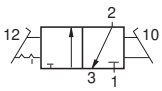
Pedal



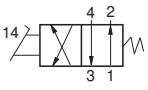
Treadle



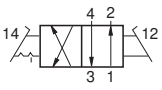
3/2 Pedal



3/2 Treadle

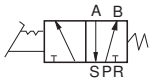


4/2 Pedal

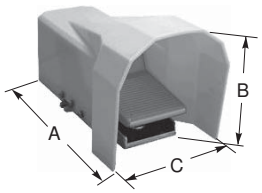


4/2 Treadle

5/2 Pedal without Lock




5/2 Pedal with Lock

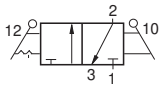
Pedal with Guard

| Port Size | Valve Type | Valve Model Numbers* | Avg. $C_v$ | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|
| 1/4 | 3/2 - Pedal | 3643A2002 | 1.2 | 6.4 (161) | 2.6 (65) | 3.5 (87) | 1.3 (0.6) |
| 1/4 | 3/2 - Treadle | 3643A2001 | 1.2 | 6.0 (152) | 3.5 (87) | 1.9 (48) | 1.3 (0.6) |
| 1/4 | 4/2 - Pedal | 3646A2002 | 1.2 | 7.2 (183) | 2.9 (73) | 3.7 (93) | 2.8 (1.3) |
| 1/4 | 4/2 - Treadle | 3646A2001 | 1.2 | 6.5 (165) | 3.7(93) | 2.5 (64) | 2.8 (1.3) |
| 1/4 | 5/2 - Pedal with Guard | RM4F210-08G* | 0.5 | 9.6 (245) | 5.2 (133) | 5.3 (135) | 2.1 (0.9) |
| 1/4 | 5/2 - Pedal with Guard | RM4F210-08LG** | 0.5 | 9.6 (245) | 5.2 (133) | 5.3 (135) | 2.1 (0.9) |

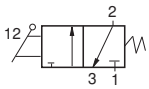
*Non-locking foot pedal. ** Locking foot pedal.

***Note: The 3/2 and 4/2 pedal and threadle valves are not designed to be used to actuate clutch/brake mechanisms on mechanical power presses.***

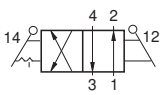
## 3/2 and 4/2 Lever Valves



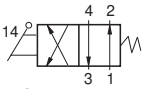
3/2 Detented



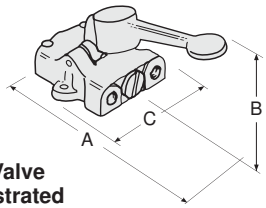
3/2 Spring Return



4/2 Detented



4/2 Spring Return



3/2 Valve Illustrated

| Port Size | Valve Type | Valve Model Numbers* | Avg. $C_v$ | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|
| 1/4 | 3/2 - Detented | 3623A2003 | 1.2 | 7.2 (182) | 3.2 (81) | 3.4 (87) | 1.3 (0.6) |
| 1/4 | 3/2 - Spring return | 3623A2004 | 1.2 | 7.2 (182) | 3.2 (81) | 3.4 (87) | 1.3 (0.6) |
| 1/4 | 4/2 - Detented | 3626A2003 | 1.2 | 7.9 (200) | 3.8 (97) | 3.7 (93) | 2.5 (1.1) |
| 1/4 | 4/2 - Spring return | 3626A2004 | 1.2 | 7.9 (200) | 3.8 (97) | 3.7 (93) | 2.5 (1.1) |

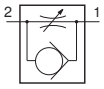
*For models with vertical handle, consult ROSS.

**STANDARD SPECIFICATIONS** (for valves on this page)**:**
**Ambient/Media Temperature:** 40° to 175°F (4° to 80°C).
**Flow Media:** Filtered air.
**Inlet Pressure:** *Series 31:* 5 to 150 psig (0.3 to 10 bar).
*Series 36:* 5 to 125 psig (0.3 to 8.5 bar).

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

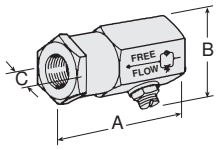
# Flow Control Valves Series 19

## Flow Control Valves

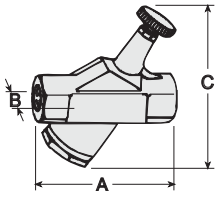



Flow control valves are used to control air flow from air cylinders, thereby controlling the speeds at which the pistons in the cylinders move. They allow free flow in one direction and adjustable, precision controlled flow in the other direction. Adjustment in the X-type models is by means of a screwdriver slot, and in the Y and Z-type models by a knurled knob.

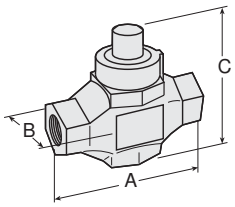
**X**




**Y**

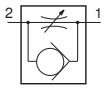



**Z**



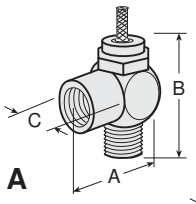

| Valve Type | Port Size | Valve Model Number | Avg. $C_v$ (Fully open) | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|
| X | 1/8 | 1968D1004 | 0.5 | 2.4 (62) | 1.3 (33) | 1.0 (25) | 0.5 (0.2) |
| | 1/4 | 1968D2004 | 0.5 | 2.4 (62) | 1.3 (33) | 1.0 (25) | 0.5 (0.2) |
| | 3/8 | 1968D3014 | 0.5 | 2.4 (62) | 1.3 (33) | 1.0 (25) | 0.5 (0.2) |
| Y | 1/4 | 1968B2007 | 2.3 | 3.5 (89) | 1.3 (33) | 4.3 (108) | 0.5 (0.2) |
| | 3/8 | 1968B3007 | 2.6 | 3.5 (89) | 1.3 (33) | 4.3 (108) | 0.5 (0.2) |
| | 1/2 | 1968B4017 | 2.6 | 3.5 (89) | 1.3 (33) | 4.3 (108) | 0.5 (0.2) |
| Y | 1/2 | 1968B4007 | 7.5 | 4.8 (121) | 1.8 (45) | 5.6 (142) | 0.8 (0.4) |
| | 3/4 | 1968B5007 | 8.3 | 4.8 (121) | 1.8 (45) | 5.6 (142) | 0.8 (0.4) |
| | 1 | 1968B6017 | 8.3 | 4.8 (121) | 1.8 (45) | 5.6 (142) | 0.8 (0.4) |
| Y | 1 | 1968B6007 | 17 | 5.4 (130) | 2.3 (57) | 7.1 (181) | 2.2 (1.0) |
| | 1¼ | 1968B7007 | 22 | 5.4 (130) | 2.3 (57) | 7.1 (181) | 2.2 (1.0) |
| | 1½ | 1968B8017 | 22 | 5.4 (130) | 2.3 (57) | 7.1 (181) | 2.2 (1.0) |
| Y | 1½ | 1968B8007 | 50 | 7.5 (191) | 3.5 (90) | 9.5 (241) | 4.3 (1.9) |
| | 2 | 1968B9007 | 50 | 7.5 (191) | 3.5 (90) | 9.5 (241) | 4.3 (1.9) |
| | 2½ | 1968B9017 | 50 | 7.5 (191) | 3.5 (90) | 9.5 (241) | 4.3 (1.9) |
| Z | 1/4 | 1968E2007 | 2.3 | 2.8 (70) | 1.3 (32) | 2.4 (60) | 0.5 (0.2) |
| | 3/8 | 1968E3007 | 2.3 | 2.8 (70) | 1.3 (32) | 2.4 (60) | 0.5 (0.2) |
| Z | 1/2 | 1968E4007 | 7.5 | 3.8 (96) | 1.6 (40) | 3.2 (82) | 0.8 (0.4) |
| | 3/4 | 1968E5007 | 8.3 | 3.8 (96) | 1.6 (40) | 3.2 (82) | 0.8 (0.4) |
| Z | 1 | 1968E6007 | 17 | 5.0 (127) | 2.5 (64) | 4.5 (113) | 2.1 (1.0) |
| | 1¼ | 1968E7007 | 22 | 5.0 (127) | 2.5 (64) | 4.5 (113) | 2.1 (1.0) |

## Right Angle Flow Control Valves

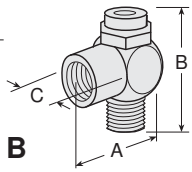



Right angle flow control valves function like those described above. However, their compact right angle design permits use where conventional straight-through flow controls might be undesirable. Flow adjustment is achieved by means of either a screwdriver slot or a knurled knob. Models listed in the table below have threaded female inlet ports.
Models in the 1/8, 1/4, and 3/8 sizes are also available with push-to-connect tubing fittings.

**A**




**B**




| Port Size | Type of Adjustment | Valve Model Number | Avg. $C_v$ (Fully open) | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|
| 1/8 | Slot (**B**) | 1968A1008* | 0.3 | 1.1 (27) | 1.3 (32) | 0.6 (15) | 0.06 (0.03) |
| 1/8 | Knob (**A**) | 1968A1018* | 0.3 | 1.1 (27) | 1.9 (48) | 0.6 (15) | 0.08 (0.04) |
| 1/4 | Slot (**B**) | 1968A2008* | 0.6 | 1.3 (33) | 1.6 (41) | 0.8 (19) | 0.12 (0.05) |
| 1/4 | Knob (**A**) | 1968A2018* | 0.6 | 1.3 (33) | 2.3 (59) | 0.8 (19) | 0.14 (0.06) |
| 3/8 | Slot (**B**) | 1968A3008* | 1.9 | 1.6 (44) | 1.9 (47) | 0.9 (23) | 0.20 (0.09) |
| 1/2 | Slot (**B**) | 1968A4008 | 2.8 | 1.8 (46) | 2.3 (58) | 1.1 (28) | 0.34 (0.15) |

*Also available for use with tubing. Consult ROSS for model numbers.

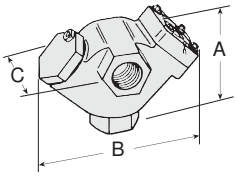
**STANDARD SPECIFICATIONS** (for valves on this page)**:**
**Ambient/Media Temperature:** 40° to 175°F (4° to 80°C).
**Flow Media:** Filtered air.

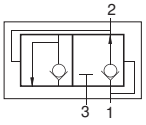
**Pressure Range:** 5 to 150 psig (0.3 to 10 bar).
**Port Threads:** NPT standard, BSPP. For BSPP threads add a "D" prefix to the model number, e.g., D1968D1004.

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

# Quick Exhaust and Shuttle Valves Series 18 &19

## Quick Exhaust Valves

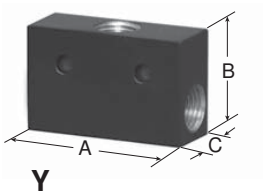


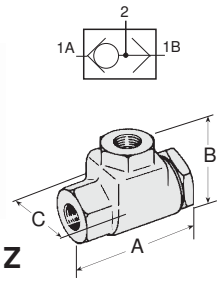




Quick cylinder reversal can be a problem if the control valve is at a distance from the cylinder or otherwise restricts the exhaust flow. A ROSS quick exhaust valve near the cylinder opens as soon as the controls valve begins exhausting, and thus allows quick reversal of the cylinder.

| Port Size In-Out | Port Size Exh. | Valve Model Number | Avg. $C_v$ In-Out | Avg. $C_v$ Out-Exh. | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|---|
| 3/8 | 1/2 | 1868A3005 | 2.9 | 3.4 | 3.2 (81) | 4.7 (119) | 2.0 (51) | 1.0 (0.5) |
| 1/2 | 1/2 | 1868A4005 | 2.9 | 3.4 | 3.2 (81) | 4.7 (119) | 2.0 (51) | 1.0 (0.5) |
| 3/4 | 1 | 1868A5005 | 7.2 | 10 | 4.3 (110) | 6.5 (165) | 2.6 (65) | 2.5 (1.1) |
| 1 | 1 | 1868A6005 | 7.2 | 10 | 4.3 (110) | 6.5 (165) | 2.6 (65) | 2.5 (1.1) |

## Shuttle Valves



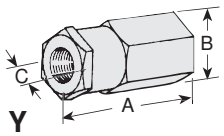



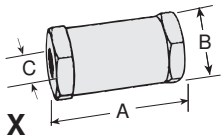

ROSS shuttle valves have two inlets and one outlet. The first inlet to be pressurized is connected to the outlet, and the second inlet is then closed. Thus, a pneumatic device connected to the shuttle outlet can be operated by either of two control valves connected to the shuttle inlets.

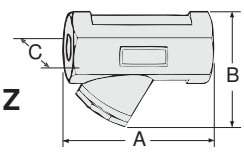
| Valve Type | Port Size | Valve Model Number | Avg. $C_v$ | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|
| Y | 1/8 | 1968E1006 | 0.8 | 1.98 (50) | 1.25 (32) | 0.75 (19) | 0.15 (0.07) |
| | 1/4 | 1968E2006 | 0.8 | 1.98 (50) | 1.25 (32) | 0.75 (19) | 0.15 (0.07) |
| Z | 1/4 | 1968D2003 | 2.0 | 2.64 (67) | 2.13 (54) | 1.25 (32) | 0.8 (0.4) |
| | 3/8 | 1968D3003 | 3.0 | 2.64 (67) | 2.13 (54) | 1.25 (32) | 0.8 (0.4) |

**STANDARD SPECIFICATIONS** (for valves on this page)**:**
**Ambient/Media Temperature:** 40° to 175°F (4° to 80°C).
**Flow Media:** Filtered air.
**Inlet Pressure:** 5 to 150 psig (0.3 to 10 bar).
**Signal Pressure:** Must be equal to or greater than inlet.
**Port Threads:** NPT standard, BSPP. For BSPP threads add a "D" prefix to the model number, e.g., D1868A3005.

# Check Valves Series 19


ROSS check valves are self-actuating and designed to provide free air flow in one direction, and to be closed to flow in the opposite direction.

| Valve Type | Port Size | Valve Model Number | Avg. $C_v$ | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|
| X | 1/8 | 1968D1005 | 0.5 | 2.7 (67) | 1.2 (29) | 1.0 (25) | 0.5 (0.2) |
| | 1/4 | 1968D2005 | 0.5 | 2.7 (67) | 1.2 (29) | 1.0 (25) | 0.5 (0.2) |
| Y | 1/4 | 1968D2001 | 2.9 | 2.8 (71) | 1.6 (40) | 1.4 (35) | 0.5 (0.2) |
| | 3/8 | 1968D3001 | 3.7 | 2.8 (71) | 1.6 (40) | 1.4 (35) | 0.5 (0.2) |
| | 1/2 | 1968D4001 | 3.9 | 3.7 (94) | 1.5 (40) | 1.4 (35) | 0.5 (0.2) |
| Z* | 1/2 | 1968A4107 | 5.2 | 4.8 (122) | 3.2 (81) | 1.8 (46) | 0.9 (0.4) |
| | 3/4 | 1968A5107 | 8.6 | 4.8 (122) | 3.2 (81) | 1.8 (46) | 0.9 (0.4) |
| | 1 | 1968A6117 | 8.3 | 4.8 (122) | 3.2 (81) | 1.8 (46) | 0.9 (0.4) |
| | 1 | 1968A6107 | 17 | 5.4 (137) | 4.3 (109) | 2.3 (58) | 2.0 (0.9) |
| | 1¼ | 1968A7107 | 22 | 5.4 (137) | 4.3 (109) | 2.3 (58) | 2.0 (0.9) |
| | 1½ | 1968A8117 | 22 | 5.4 (137) | 4.3 (109) | 2.3 (58) | 2.0 (0.9) |
| | 1½ | 1968A8107 | 50 | 7.5 (191) | 5.7 (145) | 3.5 (89) | 4.7 (2.1) |
| | 2 | 1968A9107 | 50 | 7.5 (191) | 5.7 (145) | 3.5 (89) | 4.7 (2.1) |
| | 2½ | 1968A9117 | 50 | 7.5 (191) | 5.7 (145) | 3.5 (89) | 4.7 (2.1) |

*Metric and SAE ported models also available. To order, place model number with a "D" (metric) or an "S" (SAE).

### FEATURES:

- A proven, rugged poppet design
- High flow up to Cv 50
- Self-cleaning poppet design tolerates dirty air
- Low cracking pressure
- Serviceable in-line
- Quiet operation due to soft-seal design

**STANDARD SPECIFICATIONS** (for valves on this page)**:**
**Ambient/Media Temperature:** 40° to 175°F (4° to 80°C).
**Flow Media:** Filtered air.
**Inlet Pressure:** 5 to 150 psig (0.3 to 10 bar).
**Signal Pressure:** Must be equal to or greater than inlet.

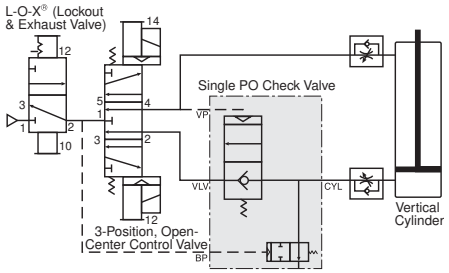
**IMPORTANT NOTE:** Please read carefully and thoroughly all of the **CAUTIONS** on the inside back cover.

# Pilot Operated Check Valves Series 27

- Can be used wherever a high-flow or remotely-controlled checking function is needed, in a circuit to provide automatic stopping of a cylinder in the event of the loss of electrical or pneumatic power.
- Also available with an automatic exhausting function, remote and manual trapped pressure relief function, or solenoid pilot dual pilot operated check.

**Single Pilot Operated Check Valve with trapped pressure relief illustrated**

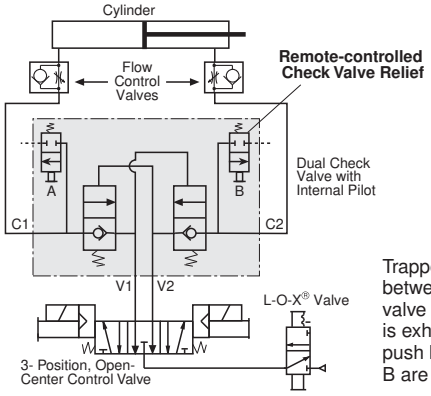
**Single Pilot Operated Check Valve with Trapped Pressure Relief Application**




## CIRCUIT FEATURES:

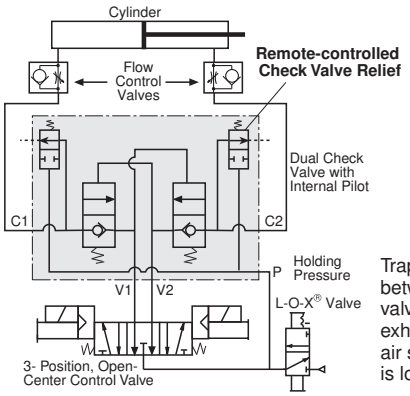
- Trapped pressure between check valve and cylinder is exhausted when the air supply at the Blowdown Signal Port (BP) is lost or locked-out.
- Cylinder moves as long as the control valve solenoid is energized. Use for continuous motion or jogging.
- Cylinder remains stationary if neither control valve solenoid is energized, or if electrical signal is lost.

**Dual Pilot Operated Check Valve Manual Trapped Pressure Relief Application**




Trapped pressure between check valve and cylinder is exhausted when push buttons A and B are pressed.

**Dual Pilot Operated Check Valve Remote Trapped Pressure Relief Application**



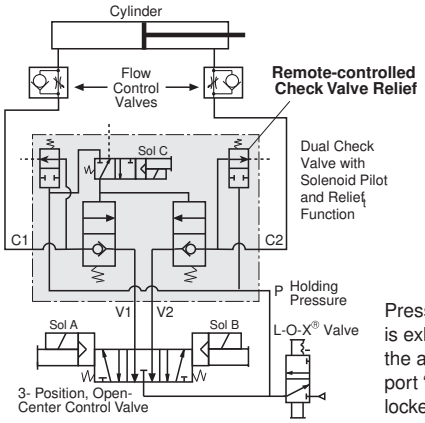

Trapped pressure between check valve and cylinder is exhausted when the air supply at "P" port is lost or locked-out.

**Dual Pilot Operated Check Valve Solenoid Pilot Controlled Application**

**TYPICAL APPLICATIONS:** Overhead lifter circuits; applications where there is a long distance between the check valve and the operating valve.

## CIRCUIT FEATURES:

- To operate cylinder, simultaneously energize solenoids A and C *or* B and C
- Pilot supply and exhaust are independent of control valve
- Response time is not affected by exhaust restrictions of the control valve
- Cylinder remains stationary if neither control valve solenoid is energized, or if electrical signal is lost
- Pressure in cylinder is exhausted when the air supply at "P" port is lost or locked-out
- L-O-X® valve provides lockable shut-off of air supply, and exhausting of trapped downstream air




Pressure in cylinder is exhausted when the air supply at port "P" is lost or locked-out.

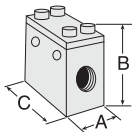
## IMPORTANT NOTES and CAUTIONS:

- Cylinder movement may occur when inlet pressure is lost. The cylinder's movement is slowed only by the restrictions of the flow control valves, and by the exhaust capacity of the check valve relief flow capacity.
- For best response, flow control valves should be installed between the check valve and the cylinder.
- Pressurizing the system after supply air has been off may cause rapid movement of the cylinder because cylinder air was exhausted while the supply air was off.

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

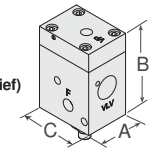
# Pilot Operated Check Valves Series 27

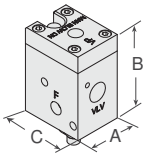
## Pressure Controlled




**Type A Single PO Check Valve Ports: 1/4 through 1/2**

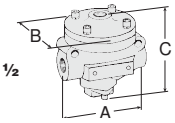
**Type A Single PO Check Valve (Remote Trapped Pressure Relief) Ports: 3/8 through 3/4**

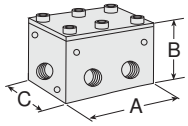



**Type A Single PO Check Valve (Manual Trapped Pressure Relief) Ports: 3/8 through 3/4**

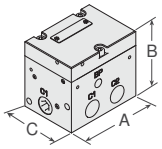
**Type B Single PO Check Valve Ports: 1/4 through 1½**

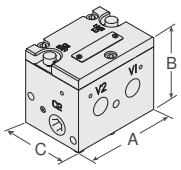



**Type C Dual PO Check Valve Ports: 3/8 through 1**

**Type D Internal Pilot Dual PO Check Valve (Remote Trapped Pressure Relief) Ports: 3/8 through 1/2**



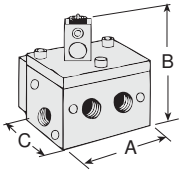




**Type D Internal Pilot Dual PO Check Valve (Manual Trapped Pressure Relief) Ports: 3/8 through 1/2**

| Valve Type | Port Size | Valve Model Number | Avg. $C_v$ (Fully open) | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|
| A | 1/4 | 2751A2908 | 2.2 | 1.5 (38) | 3.6 (91) | 2.0 (51) | 2.3 (1.0) |
| | 3/8 | 2751A3908 | 2.9 | 1.5 (38) | 3.6 (91) | 2.0 (51) | 2.3 (1.0) |
| | 1/2 | 2751A4915 | 3.2 | 1.5 (38) | 3.6 (91) | 2.5 (64) | 2.3 (1.0) |
| A Remote | 3/8 | 2751B3922 | 2.6 | 1.7 (41.9) | 3.6 (90.6) | 2.2 (55.9) | 1.8 (0.8) |
| | 1/2 | 2751B4922 | 2.8 | 1.7 (41.9) | 3.6 (90.6) | 2.2 (55.9) | 1.8 (0.8) |
| | 3/4 | 2751B5917 | 9.2 | 4.3 (110) | 4.2 (107) | 2.2 (56) | 2.9 (1.3) |
| A Manual | 3/8 | 2751B3920 | 2.6 | 1.7 (41.9) | 3.5 (88) | 2.2 (55.9) | 1.8 (0.8) |
| | 1/2 | 2751B4920 | 2.8 | 1.7 (41.9) | 3.5 (88) | 2.2 (55.9) | 1.8 (0.8) |
| | 3/4 | 2751B5919 | 9.2 | 4.3 (110) | 4.2 (107) | 2.2 (56) | 2.9 (1.3) |
| B | 1/4 | 2751A2903 | 2.3 | 3.6 (91) | 3.8 (95) | 3.1 (79) | 1.3 (0.6) |
| | 3/8 | 2751A3901 | 3.8 | 3.6 (91) | 3.8 (95) | 3.1 (79) | 1.3 (0.6) |
| | 1/2 | 2751A4902 | 4.0 | 3.6 (91) | 3.8 (95) | 3.1 (79) | 1.3 (0.6) |
| B | 1/2 | 2751A4905 | 7.7 | 4.6 (116) | 4.4 (112) | 3.1 (79) | 2.3 (1.0) |
| | 3/4 | 2751A5903 | 9.0 | 4.6 (116) | 4.4 (112) | 3.1 (79) | 2.3 (1.0) |
| | 1 | 2751A6901 | 9.0 | 4.6 (116) | 4.4 (112) | 3.1 (79) | 2.3 (1.0) |
| B | 1 | 2751B6904 | 24 | 6.7 (169) | 6.5 (165) | 4.1 (104) | 6.0 (2.7) |
| | 1¼ | 2751B7901 | 29 | 6.7 (169) | 6.5 (165) | 4.1 (104) | 6.0 (2.7) |
| | 1½ | 2751B8902 | 29 | 6.7 (169) | 6.5 (165) | 4.1 (104) | 6.0 (2.7) |
| C Dual | 3/8 | 2768C3900 | 2.9 | 3.4 (89) | 3.7 (94) | 2.4 (61) | 2.0 (0.9) |
| | 1/2 | 2768C4900 | 3.2 | 3.4 (89) | 3.7 (94) | 2.4 (61) | 2.4 (1.1) |
| | 3/4 | 2768C5900 | 8.5* | 4.4 (111) | 4.1 (104) | 3.0 (76) | 3.8 (1.7) |
| | 1 | 2768A6900 | 8.5* | 5.8 (147) | 4.1 (104) | 3.9 (99) | 6.8 (3.1) |
| D Remote | 3/8 | 2768D3901 | 2.9 | 3.6 (91.4) | 3.7 (92.4) | 2.6 (66.1) | 3.5 (1.6) |
| | 1/2 | 2768D4901 | 3.2 | 3.6 (91.4) | 3.7 (92.4) | 2.6 (66.1) | 3.5 (1.6) |
| | 3/4 | 2768D5901 | 8.5* | 5.0 (126.5) | 4.2 (107.7) | 3.4 (86.4) | 5.2 (2.3) |
| | 1 | 2768D6901 | 8.5* | 5.0 (126.9) | 4.2 (107.7) | 3.4 (86.4) | 8.8 (4.0) |
| D Manual | 3/8 | 2768D3904 | 2.9 | 3.6 (91.4) | 3.6 (91.4) | 2.6 (66.1) | 3.2 (1.4) |
| | 1/2 | 2768D4904 | 3.2 | 3.6 (91.4) | 3.6 (91.4) | 2.6 (66.1) | 3.5 (1.6) |
| | 3/4 | 2768D5904 | 8.5* | 4.8 (122) | 4.2 (107.7) | 3.4 (86.4) | 5.2 (2.3) |
| | 1 | 2768D6904 | 8.5* | 4.8 (122) | 4.2 (107.7) | 3.4 (86.4) | 8.8 (4.0) |

*Effective $C_v$ varies with load and pressure drop. Consult ROSS for specifics on your system.

## Solenoid Pilot Controlled




**Type E Solenoid Pilot Dual PO Check Valve Ports: 3/8 through 1**

| Valve Type | Port Size | Avg. $C_v$ | 24 volts DC DIN Connector | 24 volts DC 3-Pin Mini Connector | 24 volts DC 3-Pin Mini Connector | 24 volts DC 4-Pin Micro Connector | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|---|---|---|
| E | 3/8 | 2.9 | 2778D3900 | 2778D3901 | 2778D3902 | 2778D3904 | 3.6 (91.4) | 5.7 (144) | 2.6 (66.1) | 4.0 (1.8) |
| | 1/2 | 3.2 | 2778D4900 | 2778D4901 | 2778D4902 | 2778D4904 | 3.6 (91.4) | 5.7 (144) | 2.6 (66.1) | 4.2 (1.9) |
| | 3/4 | 8.5* | 2778D5900 | 2778D5901 | 2778D5902 | 2778D5904 | 5.0 (126.5) | 6.8 (172) | 3.4 (86.4) | 6.1 (2.8) |
| | 1 | 8.5* | 2778B6900 | 2778B6901 | 2778B6902 | 2778B6904 | 5.0 (126.5) | 6.8 (172) | 3.4 (86.4) | 6.1 (2.8) |

*Effective $C_v$ varies with load and pressure drop. Consult ROSS for specifics on your system.

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

***Solenoid Pilot Controlled:***

**Solenoids:** AC or DC power.
**Standard Voltages:** See page 108; consult ROSS.
**Power Consumption:** 8 VA inrush, 6 VA holding on AC; on DC 4.5 watts with 4-pin Micro connector, 60 watts with 3-pin connector.
**Ambient/Media Temperature:** 40° to 175°F (4° to 80°C).
**Ambient Temperature:** 40° to 120°F (4° to 50°C).
**Media Temperature:** 40° to 175°F (4° to 80°C).
**Inlet Pressure:** 30 to 150 psig (2 to 10 bar).

***Pressure Controlled:***

**Ambient/Media Temperature:** 40° to 175°F (4° to 80°C).
**Inlet Pressure:** 15 to 150 psig (1 to 10 bar).

***Common Specifications:***

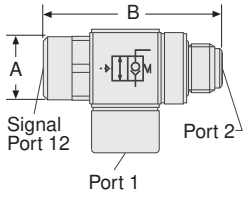
**Flow Media:** Filtered air.
**Signal Pressure:** Must be equal to or greater than inlet.
**Port Threads:** NPT standard, BSPP. For BSPP threads add a "D" prefix to the model number, e.g., D2751A2908.

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

# Right-Angle Pilot Operated Check Valves Series 19

## Pilot Operated Check Valves

Pilot Operated Check Valves are used to block the return of air from cylinders or other devices. Air flows freely from port 1 to port 2, but a signal at port 12 is required to allow flow in the reverse direction from port 2 to port 1. Right-angle design with Banjo for easy positioning of pipe or tubing.

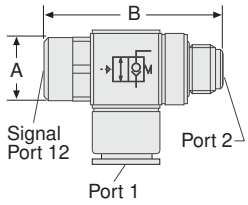



**Threaded Banjo**

### Models with Threaded Banjo

| Port Size Port 1* | Port Size Port 2** | Valve Model Number | Avg. $C_v$ 1 to 2 | Avg. $C_v$ 2 to 1 | Dimensions inches (mm) A | Dimensions inches (mm) B | Tightening Torque Max. Ft-lb (Nm) |
|---|---|---|---|---|---|---|---|
| 1/8 | 1/8 | 1958A1010 | 0.4 | 0.4 | 0.5 (13) | 1.7 (41) | 22.13 (30) |
| 1/4 | 1/4 | 1958A2010 | 0.8 | 0.7 | 0.7 (17) | 1.9 (48) | 14.75 (20) |
| 3/8 | 3/8 | 1958A3010 | 1.2 | 1.3 | 0.9 (22) | 2.2 (55) | 22.13 (30) |
| 1/2 | 1/2 | 1958A4010 | 2.3 | 2.2 | 1.1 (27) | 2.6 (66) | 29.50 (40) |
| G1/8 | G1/4 | D1958A1010 | 0.4 | 0.4 | 0.5 (13) | 1.7 (41) | 7.38 (10) |
| G1/4 | G1/4 | D1958A2010 | 0.8 | 0.7 | 0.7 (17) | 1.9 (48) | 8.85 (12) |
| G3/8 | G3/8 | D1958A3010 | 1.2 | 1.3 | 0.9 (22) | 2.2 (55) | 14.75 (20) |
| G1/2 | G1/2 | D1958A4010 | 2.3 | 2.2 | 1.1 (27) | 2.6 (66) | 22.13 (30) |

* Threads in port 1 are female.
** Port 2 threads are male.




**Push-to-Connect Fitting**

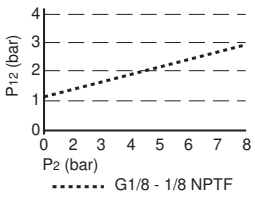
### Models with Push-to-Connect Fitting

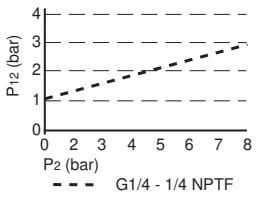
| Port Size Port 1* (tube size) | Port Size Port 2** (thread size) | Valve Model Number | Avg. $C_v$ 1 to 2 | Avg. $C_v$ 2 to 1 | Dimensions inches (mm) A | Dimensions inches (mm) B | Tightening Torque Max. Ft-lb (Nm) |
|---|---|---|---|---|---|---|---|
| 5/32" | 1/8 | 1958A1115 | 0.4 | 0.4 | 0.5 (13) | 1.7 (41) | 11.06 (15) |
| 1/4" | 1/8 | 1958A1120 | 0.4 | 0.4 | 0.5 (13) | 1.7 (41) | 11.06 (15) |
| 1/4" | 1/4 | 1958A2130 | 0.8 | 0.7 | 0.7 (17) | 1.9 (48) | 14.75 (20) |
| 3/8" | 1/4 | 1958A2110 | 0.8 | 0.7 | 0.7 (17) | 1.9 (48) | 14.75 (20) |
| 3/8" | 3/8 | 1958A3130 | 1.2 | 1.3 | 0.9 (22) | 2.2 (55) | 22.13 (30) |
| 4 mm | G1/8 | D1958A1140 | 0.4 | 0.4 | 0.5 (13) | 1.7 (41) | 7.38 (10) |
| 6 mm | G1/8 | D1958A1160 | 0.4 | 0.4 | 0.5 (13) | 1.7 (41) | 7.38 (10) |
| 8 mm | G1/8 | D1958A1180 | 0.4 | 0.4 | 0.5 (13) | 1.7 (41) | 7.38 (10) |
| 6 mm | G1/4 | D1958A2160 | 0.8 | 0.7 | 0.7 (17) | 1.9 (48) | 8.85 (12) |
| 8 mm | G1/4 | D1958A2180 | 0.8 | 0.7 | 0.7 (17) | 1.9 (48) | 8.85 (12) |
| 10 mm | G1/4 | D1958A2110 | 0.8 | 0.7 | 0.7 (17) | 1.9 (48) | 8.85 (12) |
| 8 mm | G3/8 | D1958A3180 | 1.2 | 1.3 | 0.9 (22) | 2.2 (55) | 14.75 (20) |
| 10 mm | G3/8 | D1958A3110 | 1.2 | 1.3 | 0.9 (22) | 2.2 (55) | 14.75 (20) |

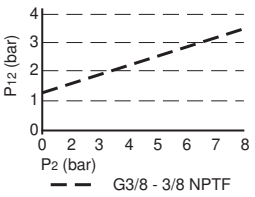
# Port 1 tubing size in inches (") or millimeters (mm).
** Port 2 threads are male.

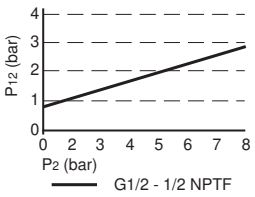
Pilot port (12) thread is M5 for models with G threads and 10-32UNF for models with NPTF threads. Manual override models available - consult ROSS.

**Signal Pressure:** The charts below show the minimum signal pressure (P12) to open the valve versus port 2 pressure ($P_2$) when there is no pressure at port 1 ($P_1$ = 0 bar).




**STANDARD SPECIFICATIONS** (for valves on this page)**:**
**Ambient/Media Temperature:** 15° to 160°F (-10° to 70°C).
**Flow Media:** Filtered air; 5 micron recommended.
**Operating Pressure:** 15 to 150 psig (1 to 10 bar).

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

# FILTERS
# PRESSURE REGULATORS
# LUBRICATORS
# SILENCERS
# RECLASSIFIERS

**For more information please refer to**

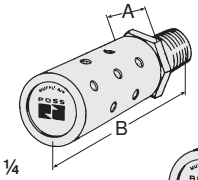
## CATALOG 420


Please visit the ROSS web site to view the complete ROSS FRL's Catalog (ROSS Form #A10120) at www.rosscontrols.com.

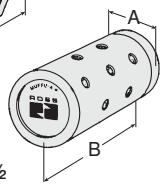
# MUFFL-AIR® Silencers

## *Noise Control Solutions for air exhaust.*

ROSS MUFFL-AIR® silencers substantially reduce exhaust noise levels yet produce little back pressure. Typical impact noise reduction is in the 20–25 dB range.




**Male Pipe Threads**
For ports 1/8 through 1¼




**Female Pipe Threads**
For ports 1¼ through 2½

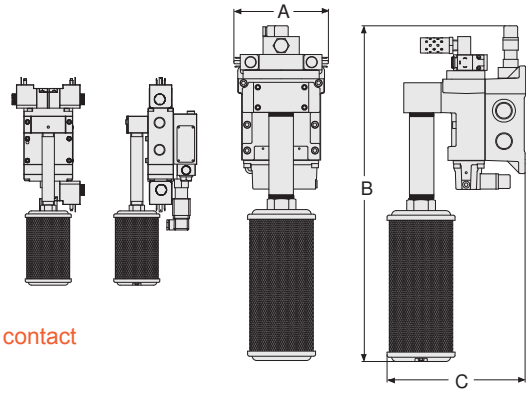
| Port Size | NPT Threads | Model Number | Avg. $C_v$ | Dimensions inches (mm) A | B | Weight lb (kg) |
|---|---|---|---|---|---|---|
| 1/8 | Male | 5500A1003 | 2.0 | 0.8 (21) | 2.2 (56) | 0.3 (0.1) |
| 1/4 | Male | 5500A2003 | 2.0 | 0.8 (21) | 2.2 (56) | 0.3 (0.1) |
| 3/8 | Male | 5500A3013 | 2.0 | 0.8 (21) | 2.2 (56) | 0.3 (0.1) |
| 3/8 | Male | 5500A3003 | 5.7 | 1.3 (32) | 3.8 (96) | 0.5 (0.2) |
| 1/2 | Male | 5500A4003 | 7.0 | 1.3 (32) | 3.8 (96) | 0.5 (0.2) |
| 3/4 | Male | 5500A5013 | 7.0 | 1.3 (32) | 3.8 (96) | 0.5 (0.2) |
| 3/4 | Male | 5500A5003 | 15 | 2.0 (51) | 5.6 (142) | 1.5 (0.7) |
| 1 | Male | 5500A6003 | 18 | 2.0 (51) | 5.6 (142) | 1.5 (0.7) |
| 1¼ | Male | 5500A7013 | 18 | 2.0 (51) | 5.6 (142) | 1.5 (0.7) |
| 1¼ | Female | 5500A7001 | 37 | 2.5 (64) | 5.9 (149) | 2.3 (1.0) |
| 1½ | Female | 5500A8001 | 38 | 2.5 (64) | 5.9 (149) | 2.3 (1.0) |
| 2 | Female | 5500B9001 | 50 | 3.0 (77) | 7.3 (185) | 3.5 (1.6) |
| 2½ | Female | 5500A9002 | 65 | 4.0 (102) | 6.9 (173) | 3.5 (1.6) |

**Pressure Range:** 150 psig (10.3 bar) maximum.

## *High-flow, high-reduction silencers for DM[1], DM[2®] Series E & DM[2®] Series C double valves.*

ROSS CONTROLS now offers high-flow, high reduction Silencer Kits designed to reduce the Exponentially Perceived Noise (EPNdB), improving equipment performance. Typical impact noise reduction is in the 35–40 dB range.

Kits are available for DM[1], DM[2®] Series E & DM[2®] Series C double valves.




| Valve Size | Threads | Kit Model Number* | Avg. $C_v$ | Dimensions inches (mm) A | B | C |
|---|---|---|---|---|---|---|
| **DM[1] & DM[2®] Series E** | | | | | | |
| 2 | NPT | 2323H77 | 256 | 4.96 (126.1) | 14.24 (361.7) | 5.68 (144.3) |
| 2 | BSPP | 2328H77 | 256 | 4.96 (126.1) | 16.05 (407.7) | 5.73 (145.5) |
| **DM[2®] Series C** | | | | | | |
| 4 | NPT | 2324H77 | 800 | 4.34 (110.2) | 19.06 (484.1) | 7.27 (184.7) |
| 8 | NPT | 2325H77 | 800 | 5.41 (137.4) | 21.18 (538.0) | 8.41 (213.6) |
| 12 | NPT | 2326H77 | 2080 | 6.74 (117.2) | 25.85 (656.6) | 10.66 (270.8) |
| 30 | NPT | 2327H77 | 7200 | 9.85 (250.2) | 41.55 (1055.4) | 13.47 (342.1) |
| 4 | BSPP | 2329H77 | 800 | 4.34 (110.2) | 21.40 (543.6) | 7.27 (184.7) |
| 8 | BSPP | 2330H77 | 800 | 5.41 (137.4) | 23.52 (597.4) | 8.41 (213.6) |
| 12 | BSPP | 2331H77 | 2080 | 6.74 (117.2) | 28.20 (716.3) | 10.66 (270.8) |
| 30 | BSPP | 2332H77 | 7200 | 9.85 (250.2) | 41.55 (1055.4) | 13.47 (342.1) |

* Kits include all plumbing required for installation.

**Pressure Range:** 125 psig (8.6 bar) maximum.

For additional information on high-flow, high-reduction Silencer Kits please contact ROSS' Global Safety Team, email: sales.info@rosscontrols.com.

# Pressure Gauges

## Pressure Gauges

| Port Size | Model Number | Range psig (bar) | Diameter inches (mm) |
|---|---|---|---|
| 1/8 | 5400A1002 | 0-160 (0-11) | 1.7 (43) |
| 1/4 | 5400A2010 | 0-60 (0-4) | 2.2 (56) |
| 1/4 | 5400A2011 | 0-200 (0-14) | 2.2 (56) |
| 1/4 | 5400A2012 | 0-300 (0-21) | 2.2 (56) |

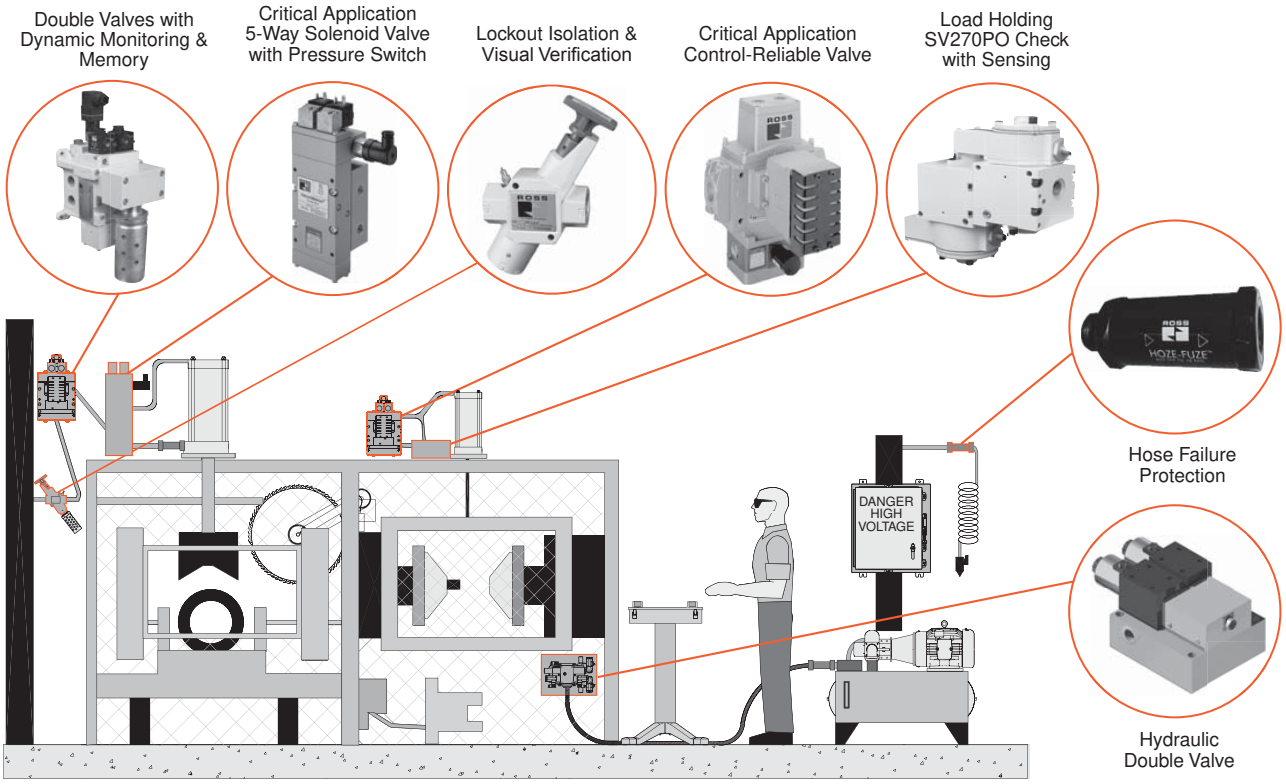
**IMPORTANT NOTE:** Please read carefully and thoroughly all of the **CAUTIONS** on the inside back cover.

# ROSS Safety-Related Solutions

ROSS has been manufacturing fluid power products since 1920. In 1954, ROSS patented the first double valve for the most demanding of safety applications, metal forming press clutch and brake control. Since that time, ROSS has patented several improved versions of the double valve and expanded its safety product offering.

ROSS has become recognized as the premier supplier of high-quality pneumatic and hydraulic safety components for various applications in metal forming.

- Control-reliable solenoid operated pneumatic valves
- L-O-X® lockout and exhaust pneumatic energy isolation valves
- EEZ-ON® soft start pneumatic valves
- Pilot-operated pneumatic check valves with pressure release
- HOZE-FUZE® air hose blow-out protection
- Latching manual valves




## Where Does Your Safety System End?

**A Complete Safety System should always include all of the components (both electrical and mechanical) – not just the electrical.**


**Fluid Power Safety for Machine Guarding Book** (order A10264)

- Over 50 pages of information providing an overview of topics related to the safe application of fluid power in industrial applications
- Topics include Control Integrity, Control Categories, LOTO, Alternative LOTO, Risk Assessment, Risk Assessment as Related to Fluid Power, Clutch/Brake Controls for Mechanical Stamping Presses, Understanding the Function of Counterbalance on Mechanical Stamping Presses, and FAQ's

**Fluid Power Safety Risk Locator Program** (order A10264CD for book+Risk Locator)

- Simply answer questions about your machine and the interactive CD program provides guidance to areas of possible safety concerns for closer examination.

# Total Machine Safety

## TOTAL MACHINE SAFETY™

**ROSS** CONTROLS

### INTRODUCTION

Total Machine Safety is the first fully-integrated electrical and fluid power machine safeguarding training program. This comprehensive approach to evaluating and designing safety controls systems is critical in the overall success of a safety program.

An understanding of global safety standard requirements for lockout and machine guarding is critical to implementing safety systems that both protect employees and promote greater productivity. When safety is addressed in the machine design process you begin to realize that safety is just another aspect of good business practices.

### WHAT'S IN IT FOR YOU?

You will learn to:

- Understand the existing global safety standard landscape and future direction
- Assess and minimize risk when evaluating machines for safety
- Examine work environments and recognize potential problems
- Grasp the basics of electrical and fluid power safety components
- Manage productivity and uptime by taking a holistic approach to machine safety

### WHAT DOES THE PROGRAM COVER?

This eight hour course is anchored on a fictional case study that addresses current safety standards, hazard & risk assessment, integration of safety devices, lockout/togout, and pneumatic & electrical components.

Total Machine Safety will cover topics such as Standards, Risk Assessment requirements, Lockout/Energy Isolation, Electrical and Fluid Power Safety Devices and applications, and overall machine safeguarding requirements and solutions. This class will not cover detailed component specifications, detailed component selection, or specific detailed circuit design. It will however provide a broad basis and understanding of what is required from a design standpoint, how to implement a machine guarding process, and how to select the components that will most effectively provide a solution while avoiding common pitfalls.

**IACET accredited for 3 CEUs.**

Electrical | Pneumatic | Lockout/Togout

**Go to www.totalmachinesafety.com for more information on scheduled seminars.**
**For additional information please contact ROSS.**

## Safety Clamping Devices

ROSS CONTROLS specializes in pneumatic and hydraulic safety solutions. When needing safety rod locks, safety catchers or safety brakes ROSS will provide you the optimum solution for every application.

**For information or technical assistance please call ROSS Technical Services in the U.S.A. at 1-888-TEK-ROSS(835-7677)**

## Safety Product Data for SISTEMA Library Users

ROSS CONTROLS has available safety product datalibrary designed for use with the innovative new Safety Integrity Software Tool for the Evaluationof Machine Applications (SISTEMA).

Developed by the Institute for Occupational Safety and Health of the German Social Accident Insurance (IFA, formerly know as the BGIA), SISTEMA is available to download for no charge at the IFA web site. This software tool is expected to prove invaluable to system designers because of its potential time savings and safety implications.

Besides having data suitable for use in this world-class system development tool, ROSS CONTROLS is conveniently providing free library data for a selection of its safety products. ROSS expects to expand the data offerings in the future.

Currently, datalibrary for the following products are available: DM2® Series C, D, E, Cat-4 double valves, DM1 Series ,Cat-3 double valves, 5/2 CrossMirror® Series, Cat-4 double valves.

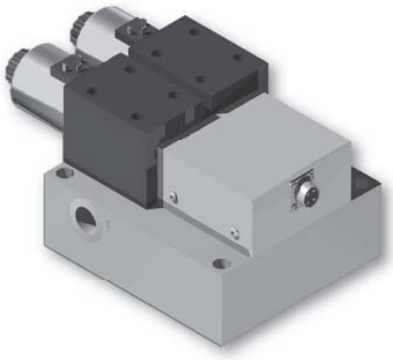
The ROSS DM2® Series safety products meet all global requirements for machine safety and are commonly used for exhausting the downstream air to help meet stop-time requirements in machine guarding applications.

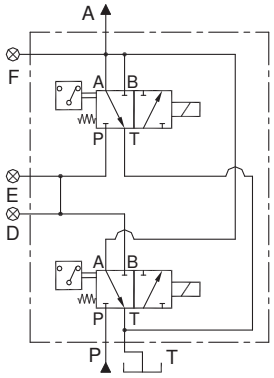
ROSS safety valve customers will find convenience and increased system design accuracy with this free software tool and data library. It can enhance their overall safety program and offers a simple way to help ensure compliance with the new EN ISO 13849-1:2008 standard.

**To receive a copy of ROSS' safety product data for the SISTEMA library, email ROSS Technical Services at techsvc@rosscontrols.com.**

# Control Reliable Hydraulic Double Valve

## Size 12, 16 and 30






**APPLICATIONS:**

- Bending Machines
- Trimming Machines
- Cutting, Forming, Piercing Machines
- Special Purpose Hydraulic Applications

This valve package features redundant valve elements that allow series flow from the inlet to the outlet of the valve package and allows parallel flow from the outlet to tank. This configuration assures that if either valving element fails to operate as requested, inlet flow will be blocked and fluid from the outlet is directed to the tank. The shifting of each valving element is monitored by its own safety switch.

**Ports:** Inlet: SAE #12 , 16 and 30
Outlet: SAE #12, 16 and 30
Tank: SAE #12, 16 and 30

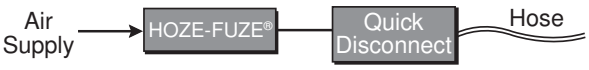
**Solenoid Voltage:**
12, 24, 48 volts DC
115, 230 voltsAC/60 Hz

**For additional information or order placement, consult ROSS.**

# HOZE-FUZE®

## Reduces the Dangers of Hose and Plastic Tubing Failure


The ROSS HOZE-FUZE® automatically reduces air flow to minimize hose whip. After a hose failure has occurred, the HOZE-FUZE® is designed to minimize the whip effect of the hose. A minimal amount of media flow will occur after the HOZE-FUZE® is triggered. This pilot flow will escape to atmosphere and continue until the HOZE-FUZE® is reset, therefore, the HOZE-FUZE® is intended to be used only with non-corrosive, non-flammable, non-hazardous gasses. To reset the HOZE-FUZE®, simply shut-off the air supply.




| Tube Size | Thread/Porting | Part Number |
|---|---|---|
| 1/4 Tube | 1/4 NPT Male x Tube Push-In | 1969A2002 |
| 6mm Tube | 1/4 BSPP Male x Tube Push-In | D1969A2002 |

| Hose Size | Thread/Porting | Part Number |
|---|---|---|
| 1/4 | Male-Female | 1969A2001 |
| 3/8 | Male-Female | 1969A3001 |
| 1/2 | Male-Female | 1969A4001 |
| 3/4 | Female | 1969A5002 |
| 1 | Female | 1969A6002 |

| Hose Size | Approximate Flow Before Shut-Off (Cfm) 50 psi | 75 psi | 100 psi | 125 psi | 150 psi | 180 psi |
|---|---|---|---|---|---|---|
| **1/4** | 13 | 15 | 18 | 21 | 23 | 26 |
| **3/8** | 39 | 49 | 58 | 67 | 76 | 87 |
| **1/2** | 65 | 80 | 96 | 111 | 126 | 14 |
| **3/4** | 110 | 126 | 142 | 158 | 174 | 193 |
| **1** | 173 | 210 | 248 | 285 | 322 | 367 |

**STANDARD SPECIFICATIONS** (for valves on this page)**:**
**Body:** Aluminum.
**Piston:** Hostalen.

**Maximum Pressure:** 260 PSI (17 Bar).
**Temperature Range:** -4° to 275°F (-20° to 135°C).

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

# Manual L-O-X® (Lockout & Exhaust) Valves

## Pneumatic Energy Isolation for LOTO

L-O-X® is your simple and effective solution. The manual L-O-X® valve controls air flow simply by a push of its large red handle in or out. The valve is open when the handle is pulled outward and air then moves freely from inlet to outlet port. A short inward push of the handle closes the inlet to the flow of air and connects the outlet port to the exhaust port to exhaust compressed air immediately from downstream.

For your convenience, L-O-X® valves are available in pipe sizes from 1/4 to 3 inches.

If your machines are not already equipped with L-O-X® or manual L-O-X® valve with EEZ-ON® operation, here are six good reasons why they should be:

- **Effectiveness:** A L-O-X® valve not only isolates the equipment by shutting off air supply, it exhausts stored or residual air immediately from downstream.
- **Ease of Use:** Air shut-off is simple; just push in the bright red or stainless steel handle! There's no turning or twisting and guessing whether the valve is completely open – it's automatic!
- **Locking protection:** L-O-X® valves are designed to allow secure lockout upon shutdown, using standard padlocks.
- **Reliability:** Special PTFE seals help ensure "shift-ability" even after long periods of non-use.
- **Efficiency:** Large exhaust ports provide rapid exhaust of downstream air and are threaded for silencers or remote exhaust lines.
- **User Confidence:** Three-way valve design opens the system to atmosphere during shut-down. Any leakage past the spool is exhausted faster than it can build up.

1/4-3/8

3/4-1¼

With ROSS' manual L-O-X® valve with EEZ-ON® operation, you get even more value. Combining the lockout function of ROSS' L-O-X® valve with the gradual start-up capability of the EEZ-ON®, the manual L-O-X® valve with EEZ-ON® operation gives you two safety-related functions in one convenient unit.

1½-2

A ROSS EEZ-ON® valve is designed to allow a gradual buildup of downstream air pressure before opening the line to full air flow. This gradual pressure buildup allows cylinders or other work elements to move slowly and more safely into their normal working positions before full line pressure buildup is applied. The time required for full pressure buildup is adjustable.

EEZ-ON® valves are available as either 2/2 (2-port, 2-position) or 3/2 (3-port, 2-position) valves. Either type can be used in conjunction with a L-O-X® valve to supply a lockout and exhaust feature in addition to the gradual buildup of supply pressure.

The L-O-X® valve and EEZ-ON® valve functions can now also be obtained in a combined configuration – the manual L-O-X® valve with EEZ-ON® operation. In this valve, all the functions are combined in a single valve for the most compact installation possible.

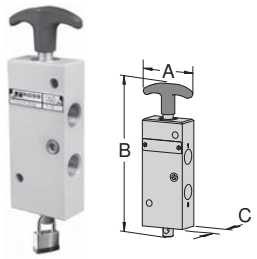
The Stainless Steel Manual L-O-X® valve offers easy and reliable solutions for applications where corrosion and contaminants are a concern. Featuring 316 stainless steel construction and self-draining capability, this rugged valve is an excellent solution for washdown applications.

Stainless Steel
1/4 thru 2

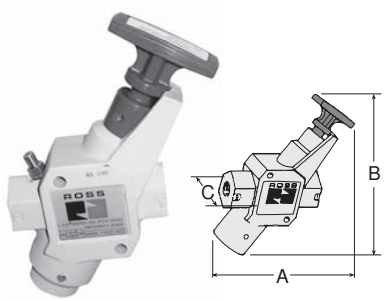
The Stainless Steel L-O-X® is an asset in many applications including:

Food and Beverage • Pharmaceutical • Pulp and Paper
Chemical Processing • Oil and Gas • Off-Shore Industries

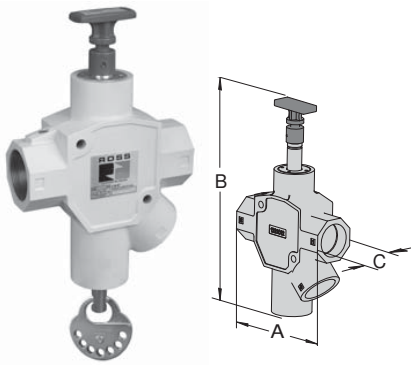
# Manual L-O-X® Valves Series 15




**Port Sizes 1/4 and 3/8**




**Port Sizes 3/8 thru 1¼**




**Port Sizes 1½ and 2**

ROSS manual L-O-X® (lockout & exhaust) valves are energy isolation valves and are generally used as the first valve in a line supplying compressed air to equipment. Air can be shut-off by pushing the red L-O-X® handle inward; downstream air is simultaneously exhausted through the L-O-X® exhaust port. OSHA compliance requires that the valve be padlocked in this position to prevent handle from being pulled out inadvertently during maintenance and/or servicing.

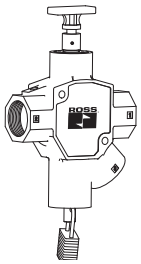
The ROSS manual L-O-X® valve has a large red operating handle for high visibility. When the handle is pulled out, there is full line pressure. A short, full inward push of the handle closes off the flow of air, and quickly exhausts the pressure in the downstream line. This action is swift and doesn't require a difficult, slow, or confusing twisting action.

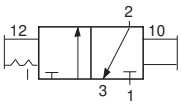
*NOTE: If a system requires gradual buildup of downstream pressure, see manual L-O-X® valves with EEZ-ON® operation.*

The controlling spool of the valve employs seals made of very low-friction material. These seals enable the L-O-X® spool to shift smoothly and easily even after being on standby for a long period of time. The exhaust port is threaded for the installation of a silencer or a line for remote exhausting. Two mounting holes are provided to simplify the installation of the L-O-X® valve.

**Manual L-O-X® valve shown padlocked in closed position. The valve can only be locked in the closed position.**

**Push/pull operation - Push the handle inward to exhaust downstream air (lockable in this position). Pull the handle outward to supply air downstream.**






| Port Size In-Out | Port Size Exh. | Valve Model Number | Avg. Cv 1 to 2 | Avg. Cv 2 to 3 | Dimensions inches (mm) A | Dimensions inches (mm) B | Dimensions inches (mm) C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|---|
| 1/4 | 3/8 | Y1523C2002 | 1.84 | 1.79 | 2.3 (58) | 6.5 (166) | 1.0 (26) | 0.9 (0.4) |
| 3/8 | 3/8 | Y1523C3012 | 2.67 | 2.64 | 2.3 (58) | 6.5 (166) | 1.0 (26) | 0.9 (0.4) |
| 3/8 | 3/4 | Y1523C3002* | 4.74 | 3.57 | 6.3 (159) | 8.8 (225) | 2.0 (51) | 1.5 (0.7) |
| 1/2 | 3/4 | Y1523C4002* | 7.10 | 4.00 | 6.3 (159) | 8.8 (225) | 2.0 (51) | 1.5 (0.7) |
| 3/4 | 3/4 | Y1523C5012* | 8.26 | 4.10 | 6.3 (159) | 8.8 (225) | 2.0 (51) | 1.5 (0.7 |
| 3/4 | 1¼ | Y1523C5002* | 13.12 | 8.98 | 7.6 (194) | 10.6 (270) | 2.3 (57) | 2.5 (1.1) |
| 1 | 1¼ | Y1523C6002* | 16.56 | 9.52 | 7.6 (194) | 10.6 (270) | 2.3 (57) | 2.5 (1.1) |
| 1¼ | 1¼ | Y1523C7012* | 19.25 | 9.74 | 7.6 (194) | 10.6 (270) | 2.3 (57) | 2.5 (1.1) |
| 1½ | 2 | Y1523C8002 | 35.53 | 50.98 | 8.2 (209) | 14.9 (379) | 3.0 (77) | 8.2 (3.6) |
| 2 | 2 | Y1523C9012 | 40.38 | 52.23 | 8.2 (209) | 14.9 (379) | 3.0 (77) | 8.2 (3.6) |

**For coordinating silencers, see MUFFL-AIR® Silencers (model numbers 5500A2003, 5500A3003, 5500A5003, 5500A7013 and 5500B9001), page 57.**

**NOTE:** Model number 5500B9001 is female threaded as is the exhaust port in the valve. Therefore, a pipe nipple will be needed in order to attach the muffler to the valve.

**CAUTION:** These L-O-X® valves are rated to 20 bar (300 psig), but the mufflers listed above are rated only to 10 bar (150 psig). These mufflers must not be used for applications with pressures greater than 10 bar (150 psig) or serious injury or damage could occur.

**STANDARD SPECIFICATIONS** (for valves on this page)**:**
**Ambient/Media Temperature:** 40° to 175°F (4° to 80°C).
**Flow Media:** Filtered air.
**Inlet Pressure:**
*Port sizes 1/4 to 3/8:* 15 to 145 psig (1 to 10 bar).
*Port sizes 3/8 to 2:* 15 to 300 psig (1 to 20 bar).
**Port Threads:** NPT standard, BSPP. For BSPP threads, insert a "D" after "Y" to the model number, e.g., YD1523C2002.

**Lock Hole Diameter:**
*Port sizes 1/4 to 3/8:* 0.27 inch (7.06 mm).
*Port sizes 1½ to 2:* 0.38 inch (9.6 mm).
**Length of Hole:**
*Port sizes 1/4 to 3/8:* 0.43 inch (10.92 mm).
*Port sizes 1½ to 2:* 0.75 inch (19.1 mm).
**NOTE:** Per specifications and regulations, these products are defined as energy isolation devices, **NOT AS EMERGENCY STOP DEVICES.**

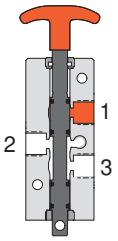
**IMPORTANT NOTE:** Please read carefully and thoroughly all of the **CAUTIONS** on the inside back cover.

# Manual L-O-X® Valves Series 15

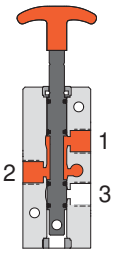
## VALVE OPERATION

### 1/4 and 3/8 Port Sizes

**VALVE CLOSED**
When the red handle is pushed inward, the flow of supply air is blocked and downstream air is exhausted via the exhaust port. While servicing or maintaining machinery, the L-O-X® valve should be padlocked in this position to prevent the handle from being pulled outward inadvertently where potential for human injury exists.

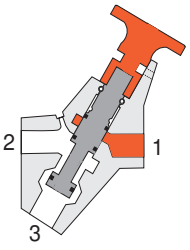



**VALVE OPEN**
When the red handle is pulled outward supply air flows freely from inlet to outlet and flow to exhaust is blocked. A detent keeps the handle in the open position.

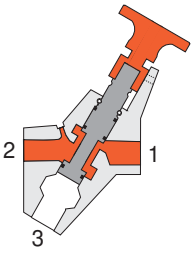



### 3/8 thru 1¼ Port Sizes

**VALVE CLOSED**
With a short push of the red handle inward, the flow of supply air is blocked and downstream air is exhausted via the exhaust port at the bottom of the valve. The L-O-X® valve should be padlocked in this position to prevent the handle from being pulled outward inadvertently where potential for human injury exists or while servicing machinery.

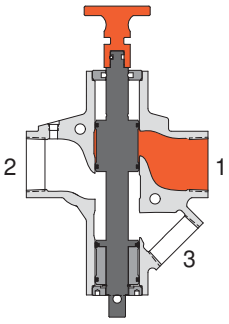



**VALVE OPEN**
When the red handle is pulled out, supply air flows freely from inlet to outlet and flow to exhaust is blocked. A detent keeps the handle in the open position. The handle is not designed to be locked in this position, thereby providing for ready shut-off when necessary.

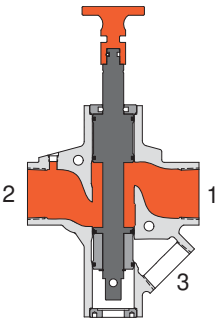



### 1½ and 2 Port Sizes

**VALVE CLOSED**
With a short push of the red handle inward, the flow of supply air is blocked and downstream air is exhausted via the exhaust port while servicing or maintaining machinery. Padlock the L-O-X® valve in this position to prevent the handle from being pulled outward inadvertently to avoid potential for human injury while servicing machinery.




**VALVE OPEN**
When the red handle is pulled out, supply air flows freely from inlet to outlet and flow to exhaust is blocked. A detent keeps the handle in the open position. The handle is not designed to be locked in this position, thereby providing for ready shut-off when necessary.




## L-O-X® Sensing Port

L-O-X® Sensing Port - Series 15 manual L-O-X® and manual L-O-X® valves with EEZ-ON® operation are now provided with 1/8 NPT sensing ports, enabling installation of a pressure sensing device such as the Pop-Up Indicator or Pressure Switch shown below. Standards suggest that machine design should include a method for verifying the release of energy after lockout.

| |
|---|
| The ROSS 988A30 Pop-Up Indicator is constructed for the industrial environment with a brass body and 1/8" NPT connection. It offers 360° visibility and a redundant verification feature. By pushing on the red plunger, the operator can "feel" the presence of pressure and verify that the indicator is performing its sensing function. |
| The ROSS 586A86 Pressure Switch offers an electronic pressure sensing option that can be integrated into a safety monitoring system, which confirms energy isolation throughout the circuit. |

# Energy Release Verification Options

## Visual Pop-Up Indicator or Pressure Switch (electrical)

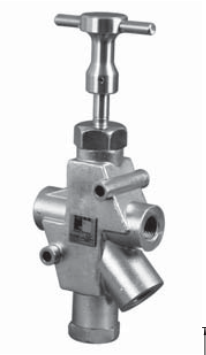
- May be installed on all L-O-X® valves and manual L-O-X® valves with EEZ-ON® operation with pressure sensing port
- Provides a means to verify the release of downstream pressure to next obstruction

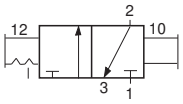
| Verification Option | Model Number | Inlet Port Size* |
|---|---|---|
| Pop-Up Indicator | 988A30 | 1/8 |
| Pressure Switch | 586A86 | 1/8 |

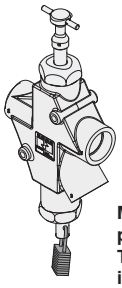
* NPT port threads.

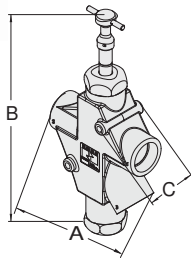
# Stainless Steel Manual L-O-X® Valves Series 15

## Port Sizes 1/4 thru 2








**Manual L-O-X® valve shown padlocked in closed position. The valve can only be locked in the closed position.**

**Push/pull operation - Push the handle inward to exhaust downstream air (lockable in this position). Pull the handle outward to supply air downstream.**

ROSS L-O-X® valves are energy isolation valves and are generally used as the first valve in a line supplying compressed air to equipment.
Air can be shut off by pushing the L-O-X® handle inward; downstream air is simultaneously exhausted through the L-O-X® exhaust port. Many standards & regulations, e.g., OSHA, require that the valve be padlocked in this position to prevent handle from being pulled out inadvertently during maintenance and/or servicing.

**FEATURES:**

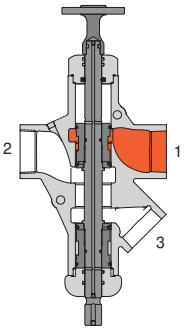
- Easily identified by unique shape
- Corrosion-resistant 316 stainless steel construction
- Reliable Fluorocarbon seals withstand contaminant ingression
- Self-draining, washdown suitable design
- Trusted L-O-X® performance
- Lockable only in the OFF position
- Large exhaust port for rapid release of pressure
- Standard pressure sensing port with optional pressure switch or visual indicator
- Simple push/pull of the large handle provides direct manual operation
- Pressure sensing port allows installation of either the visual indicator or pressure switch to verify pressure downstream to the next obstruction is released

| Port Size In-Out | Exh. | Valve Model Number* | Avg. $C_v$ In-Out | Out-Exh. | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|---|
| 1/4 | 1/4 | 1523A2004 | 2.14 | 2.08 | 3.5 (89.9) | 8.6 (218.3) | 2.1 (53.6) | 3.75 (1.70) |
| 3/8 | 1/2 | 1523A3004 | 5.79 | 6.24 | 4.3 (108.5) | 10.5 (265.8) | 1.8 (44.5) | 6.0 (2.72) |
| 1/2 | 1/2 | 1523A4004 | 5.79 | 6.24 | 4.3 (108.5) | 10.5 (265.8) | 1.8 (44.5) | 6.0 (2.72) |
| 3/4 | 1 | 1523A5004 | 14.30 | 17 | 6.0 (151.1) | 14.1 (356.9) | 2.5 (63.5) | 13.0 (5.89) |
| 1 | 1 | 1523A6004 | 14.30 | 17 | 6.0 (151.1) | 14.1 (356.9) | 2.5 (63.5) | 13.0 (5.89) |
| 1½ | 2 | 1523A8004 | 39 | 45 | 8.2 (208) | 18.5 (470) | 4.0 (101) | 35.0 (15.87) |
| 2 | 2 | 1523A9004 | 39 | 45 | 8.2 (208) | 18.5 (470) | 4.0 (101) | 35.0 (15.87) |

## VALVE OPERATION

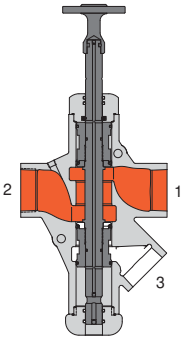
### VALVE CLOSED

With a push of the handle inward, the flow of supply air is blocked and downstream air is exhausted via the exhaust port while servicing or maintaining machinery. Padlock the L-O-X® valve in this position to prevent the handle from being pulled outward inadvertently to avoid potential for human injury while servicing machinery.




### VALVE OPEN

When the handle is pulled out, supply air flows freely from inlet to outlet and flow to exhaust is blocked. A detent keeps the handle in the open position. The handle is not designed to be locked in this position, thereby providing for ready shut-off when necessary.




**Referenced Standards:** All standards are subject to revision. Parties are encouraged to investigate and apply the most recent editions of the standards indicated in the following listing: OSHA 29 CFR 1910.147; CSA Z142-10; CSA Z460-05; ISO 13849-1; ISO 14118:2000; EN 1037; ANSI Z244.1- 2003(R2008); ANSI/PMMI B155.1- 2006, ANSI B11-2008.

**STANDARD SPECIFICATIONS** (for valves on this page)**:**
**Ambient/Media Temperature:** 30° to 175°F (-1° to 80°C).
***Note: For lower temperature ratings, consult ROSS.***
**Flow Media:** Filtered air.
**Inlet Pressure:** 0 to 300 psig (0 to 20.7 bar).
**Port Threads:** NPT standard, BSPP. For BSPP threads, add a "D" prefix to the model number, e.g., D1523A2004.
**Lock Hole Diameter:** *Port sizes 1/4 thru 2:* 0.34 inch (8.64 mm).

**Length of Hole:**
*Port size 1/4:* 0.44 in (11.17mm).
*Port size 1/2:* 0.47 in (11.93mm)
*Port size 1 and 2:* 0.55 inch (13.97 mm).
**NOTE:** Per specifications and regulations, these products are defined as energy isolation devices**, NOT AS EMERGENCY STOP DEVICES.**

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

# L-O-X® Stainless Steel Accessories Series 15

## Stainless Steel Silencer

Silencers port sizes 1/4 thru 1 have all stainless steel construction.
Silencer port size 2 have standard construction consisting of nickel plated bodies and stainless internals.
All silencers are supplied with a standard pipe thread fitting for attaching directly to the exhaust ports of air-operated equipment.

| Port Size | Construction | Model Number | Threads* | Dimensions inches (mm) Width | Length |
|---|---|---|---|---|---|
| 1/4 | Stainless Steel | 5500A2004 | Male | 0.56 (14.2) | 1.75 (44.5) |
| 1/2 | Stainless Steel | 5500A4004 | Male | 0.87 (22.1) | 2.75 (69.7) |
| 1 | Stainless Steel | 5500A6004 | Male | 1.31 (33.3) | 3.87 (98.3) |
| 2 | Standard Construction | 5500A9004 | Male | 2.37 (60.2) | 5.50 (139.7) |

**Stainless Steel Silencers**

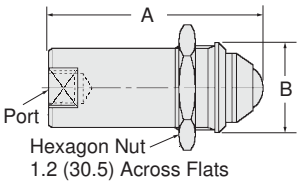
## Pneumatic Energy Release Verification Options

- 316 Stainless Steel Body, Internals and Springs • Nitrile Seals
- Visual Indicator piston Acetal • Visual Indicator assembly Acetal with acrylic lens

**Visual Indicator**

| Model Number | Inlet Port Size* | Outlet Port Size | Dimensions inches (mm) A | B | Weight lb (kg) |
|---|---|---|---|---|---|
| 1155H30 | 1/8 | Visual Indicator | 2.33 (59.3) | 1.00 (25.4) | 0.22 (0.1) |
| 1162A30 | 1/8 | Pressure Switch | – | – | – |

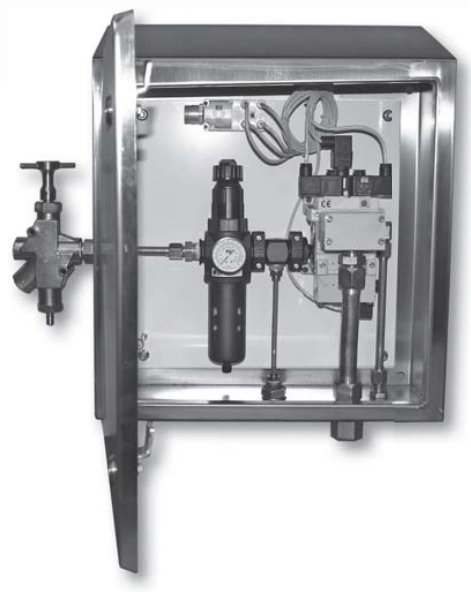
* NPT port threads.




**For information on Stainless Steel Filter/Regulator please visit www.rosscontrols.com.**

## Stainless Steel Cabinet for Wash-Down Applications

### Control Reliable Energy Isolation



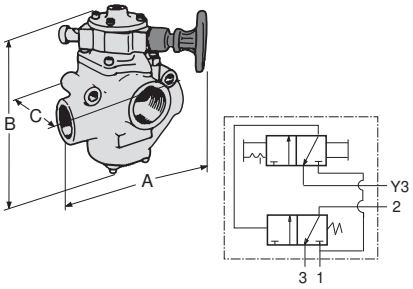
**Manual energy isolation device (L-O-X®) located outside the cabinet is stainless steel and designed for wash-down areas.**
**Stainless steel control cabinet includes filter/regulator and Category 4 DM²® valve for air entry control.**
**Control cabinet is built with slanted top to avoid pooling.**

***Will build to your specifications!***

For more information on Stainless Steel Cabinet for Wash-Down Applications
please contact ROSS' Global Safety Team, email: sales.info@rosscontrols.com.

# Piloted Valves with L-O-X® Control Series 27

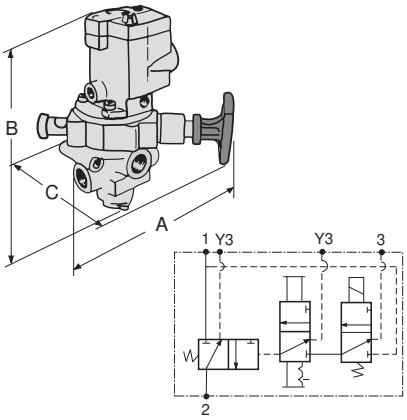
## MANUAL PILOT




**Operated just like the smaller manual L-O-X® valve. The position of the red handle indicates instantaneous full flow pressurizing or exhausting capability.**

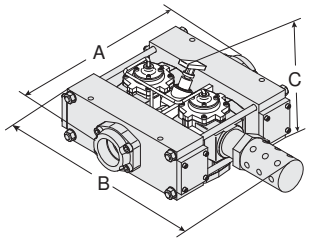
| Port Size In-Out | Exh. | Valve Model Number* | Avg. Cv 1 to 2 | 2 to 3 | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|---|
| 1 | 1½ | Y2783A6006 | 23 | 34 | 7.4 (187) | 8.6 (218) | 6.4 (162) | 7.0 (3.2) |
| 1¼ | 1½ | Y2783A7006 | 30 | 32 | 7.4 (187) | 8.6 (218) | 6.4 (162) | 7.0 (3.2) |
| 1½ | 1½ | Y2783A8016 | 30 | 31 | 7.4 (187) | 8.6 (218) | 6.4 (162) | 7.0 (3.2) |
| 1½ | 2½ | Y2783A8006 | 68 | 70 | 8.4 (213) | 10.2 (259) | 6.6 (168) | 15.3 (6.9) |
| 2 | 2½ | Y2783A9006 | 70 | 70 | 8.4 (213) | 10.2 (259) | 6.6 (168) | 15.3 (6.9) |
| 2½ | 2½ | Y2783A9016 | 70 | 71 | 8.4 (213) | 10.2 (259) | 6.6 (168) | 15.3 (6.9) |
| 3 | 2½ | Y3900A0829** | 140 | 140 | 19.6 (496) | 25.3 (643) | 11.5 (292) | 110 (49.9) |

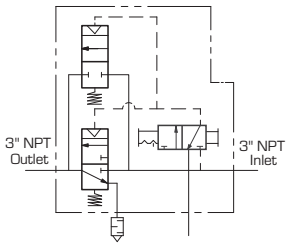
## SOLENOID PILOT



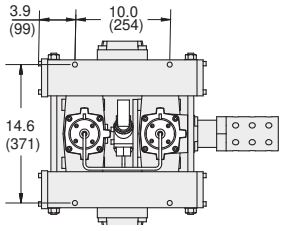

| Port Size In-Out | Exh. | Valve Model Number* | Avg. Cv 1 to 2 | 2 to 3 | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|---|
| 1/4 | 1/2 | Y2773A2072 | 2.5 | 3.1 | 7.1 (181) | 8.4 (212) | 6.5 (165) | 3.5 (1.6) |
| 3/8 | 1/2 | Y2773A3072 | 3.6 | 5.3 | 7.1 (181) | 8.4 (212) | 6.5 (165) | 3.5 (1.6) |
| 1/2 | 1/2 | Y2773A4082 | 3.3 | 5.3 | 7.1 (181) | 8.4 (212) | 6.5 (165) | 3.5 (1.6) |
| 1/2 | 1 | Y2773A4072 | 6.3 | 9.2 | 7.1 (181) | 9.0 (228) | 6.9 (175) | 4.3 (1.9) |
| 3/4 | 1 | Y2773A5072 | 7.7 | 11 | 7.1 (181) | 9.0 (228) | 6.9 (175) | 4.3 (1.9) |
| 1 | 1 | Y2773A6082 | 8.0 | 12 | 7.1 (181) | 9.0 (228) | 6.9 (175) | 4.3 (1.9) |
| 1 | 1½ | Y2773A6072 | 23 | 34 | 8.1 (206) | 11.8 (299) | 6.9 (175) | 8.0 (3.6) |
| 1¼ | 1½ | Y2773A7072 | 30 | 32 | 8.1 (206) | 11.8 (299) | 6.9 (175) | 8.0 (3.6) |
| 1½ | 1½ | Y2773A8082 | 30 | 31 | 8.1 (206) | 11.8 (299) | 6.9 (175) | 8.0 (3.6) |
| 1½ | 2½ | Y2773A8072 | 68 | 70 | 9.3 (235) | 13.8 (352) | 7.3 (184) | 17.5 (7.9) |
| 2 | 2½ | Y2773A9072 | 70 | 70 | 9.3 (235) | 13.8 (352) | 7.3 (184) | 17.5 (7.9) |
| 2½ | 2½ | Y2773A9082 | 70 | 71 | 9.3 (235) | 13.8 (352) | 7.3 (184) | 17.5 (7.9) |
| 3 | 2½ | Y3900A0896** | 140 | 140 | 19.6 (496) | 25.3 (643) | 14.9 (379) | 115 (53.0) |

## **3 Inch L-O-X® VALVE FOR LOCKOUT

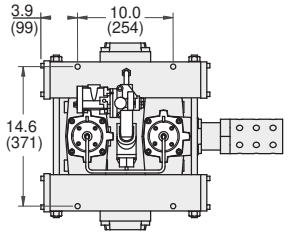



**Top View and Mounting Dimensions -** inches (mm)




**Manual Pilot - Model 3900A0829**




**Solenoid Pilot - Model 3900A0896**

**For coordinating silencers, see MUFFL-AIR® Silencers (model numbers 5500A4003, 5500A6003, 5500A8001 and 5500A9002), page 57.**

## L-O-X® Sensing Port

L-O-X® Sensing Port - Series 15 manual L-O-X® valves and manual L-O-X® valves with EEZ-ON® operation are now provided with 1/8 NPT sensing ports, enabling installation of a pressure sensing device such as the Pop-Up Indicator or Pressure Switch shown below. Standards suggest that machine design should include a method for verifying the release of energy after lockout.

The ROSS 988A30 Pop-Up Indicator is constructed for the industrial environment with a brass body and 1/8" NPT connection. It offers 360° visibility and a redundant verification feature. By pushing on the red plunger, the operator can "feel" the presence of pressure and verify that the indicator is performing its sensing function.

The ROSS 586A86 Pressure Switch offers an electronic pressure sensing option that can be integrated into a safety monitoring system, which confirms energy isolation throughout the circuit.

**STANDARD SPECIFICATIONS:** See page 67.

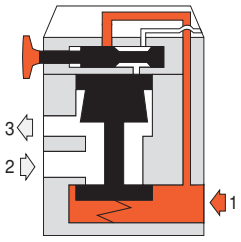
**IMPORTANT NOTE:** Please read carefully and thoroughly all of the **CAUTIONS** on the inside back cover.

# Piloted Valves with L-O-X® Control Series 27

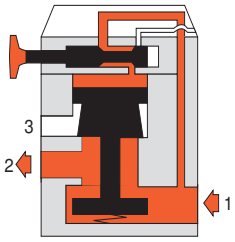
## VALVE OPERATION

### MANUAL PILOT

**VALVE CLOSED**
With a short push of the red handle inward the flow of supply air is blocked and downstream air is exhausted via the exhaust port. Air pressure on the inlet and exhaust poppets produces a large closing force. The L-O-X® valve should be padlocked in this position to prevent the handle from being pulled outward inadvertently when potential for human injury exists or servicing machinery.

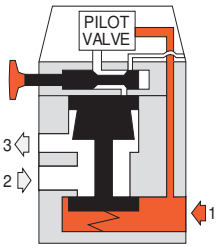



**VALVE OPEN**
With the red handle pulled out, pilot air flows to the top of the actuating piston, causing it to open the inlet poppet. Supply air then flows freely from inlet to outlet, and the exhaust port is blocked. A detent keeps the L-O-X® handle in the open position. The handle is designed not to be locked in the open position, thereby allowing for quick shut-off when necessary.

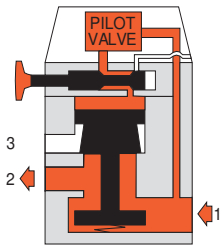



### SOLENOID PILOT

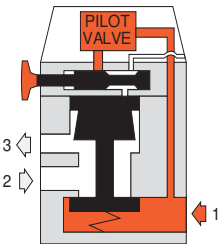
**PILOT DE-ENERGIZED**
With the solenoid pilot de-energized (regardless of the position of the L-O-X® handle) the inlet poppet remains closed. The outlet port is connected to the exhaust port so that pressure in the downstream lines is vented to atmosphere.




**PILOT ENERGIZED**
With the solenoid pilot energized and the L-O-X® control in the open position, air can flow from inlet to outlet port. The exhaust port is closed.




**L-O-X® VALVE CLOSED**
With the handle pushed inward, the L-O-X® control is closed, and air to the valve piston is cut off. This allows the inlet poppet to be closed by its spring and the pressure of the inlet air. The outlet is connected to exhaust so downstream pressure is vented.




**Manual Pilot Valve with L-O-X® Control**

**Solenoid Pilot Valve with L-O-X® Control**

**NOTE:** Per specifications and regulations, these products are defined as energy isolation devices, **NOT AS EMERGENCY STOP DEVICES.**

**STANDARD SPECIFICATIONS** (for valves on page 66)**:**
**Ambient/Media Temperature:**
*Manual Pilot:* 40° to 175°F (4° to 80°C).
**Ambient Temperature:**
*Solenoid Pilot:* 40° to 120°F (4° to 50°C).
**Media Temperature:**
*Solenoid Pilot:* 40° to 175°F (4° to 80°C).
**Flow Media:** Filtered air; 5 micron recommended.
**Inlet Pressure:** *Manual Pilot:*
*Port sizes 1 to 2½:* 15 to 150 psig (1 to 10 bar).
*Port sizes 1½ to 2½:* 30 to 150 psig (2 to 10 bar).
**Inlet Pressure:** *Solenoid Pilot:*
*Port sizes 1/4 to 1½:* 15 to 150 psig (1 to 10 bar).
*Port sizes 1½ to 2½:* 30 to 150 psig (2 to 10 bar).
***Body Paint:** Yellow.
***Port Threads:** NPT standard. For BSPP threads, insert a "D" after "Y" to the model number, e.g., YD2783A6006.

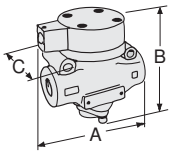
**STANDARD SPECIFICATIONS (**for 3 inch L-O-X® valves)**:**
**Inlet Pressure:** 30 to 150 psig (2 to 10 bar).
**Pilot Pressure:** Must be equal to or greater than inlet pressure.
**Flow Media:** Filtered air; 5 micron filter recommended.
**Port Threads:** NPT.
*For model Y3900A0829*
**Ambient/Media Temperature:** 40° to 175° F (4° to 80° C).
*For model Y3900A0896*
**Solenoids:** AC or DC power.
**Power Consumption:** 87 VA inrush, 30 VA holding on 50 or 60 Hz; 14 watts on DC.
**Ambient Temperature:** 40° to 120° F (4° to 50° C).
**Media Temperature:** 40° to 175° F (4° to 80° C).

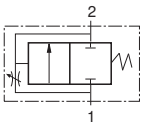
**IMPORTANT NOTE:** Please read carefully and thoroughly all of the **CAUTIONS** on the inside back cover.

# EEZ-ON® Valves Series 27

An EEZ-ON® valve is used in an air supply line to provide a gradual buildup of downstream air pressure. This permits cylinders or other work elements to move slowly into their normal working positions before full line pressure is applied. The time required to reach full line pressure is adjustable.

## 2/2 Valves

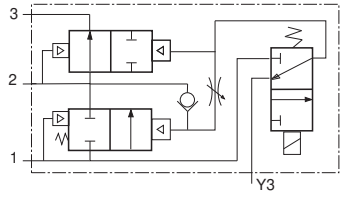


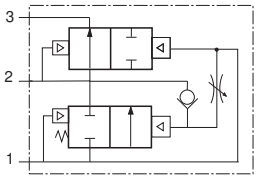

| Port Size | Valve Model Numbers* | Avg. Cv | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|
| 1/4 | 2781A2007 | 2.3 | 3.8 (97) | 3.8 (97) | 3.0 (77) | 1.5 (0.7) |
| 3/8 | 2781A3007 | 3.8 | 3.8 (97) | 3.8 (97) | 3.0 (77) | 1.5 (0.7) |
| 1/2 | 2781A4017 | 4.0 | 3.8 (97) | 3.8 (97) | 3.0 (77) | 1.5 (0.7) |
| 1/2 | 2781A4007 | 13.0 | 4.6 (117) | 4.5 (114) | 3.0 (77) | 2.3 (1.0) |
| 3/4 | 2781A5007 | 15.0 | 4.6 (117) | 4.5 (114) | 3.0 (77) | 2.3 (1.0) |
| 1 | 2781A6017 | 16.0 | 4.6 (117) | 4.5 (114) | 3.0 (77) | 2.3 (1.0) |
| 1 | 2781A6007 | 24.0 | 6.6 (168) | 7.6 (192) | 4.1 (103) | 6.0 (2.7) |
| 1¼ | 2781A7007 | 29.0 | 6.6 (168) | 7.6 (192) | 4.1 (103) | 6.0 (2.7) |
| 1½ | 2781A8017 | 29.0 | 6.6 (168) | 7.6 (192) | 4.1 (103) | 6.0 (2.7) |

## 3/2 Valves

The 3/2 EEZ-ON® valve provides the same gradual pressure buildup as the 2/2 EEZ-ON® valves described above. In addition, the 3/2 valve has an exhaust port so that downstream air is exhausted when the valve is de-energized. At the same time, supply air is positively shut-off so that a separate shut-off valve is not required.




Solenoid Pilot Controlled




Internal Pressure Controlled

**Solenoid Pilot Controlled**

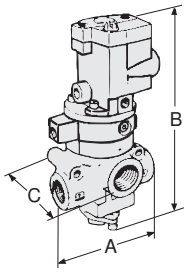
1/4 thru 1 Exhaust Port Size

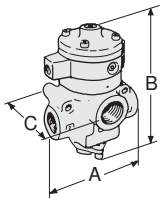
1 thru 1½ Exhaust Port Size

**Internal Pressure Controlled**

1/4 thru 1 Exhaust Port Size

1 thru 1½ Exhaust Port Size




| Port Size In-Out | Exh. | Valve Model Number* | Avg. Cv 1 to 2 | 2 to 3 | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|---|
| **Solenoid Pilot Controlled** | | | | | | | | |
| 1/4 | 1/2 | 2773B2037 | 2.5 | 3.1 | 4.1 (105) | 8.8 (224) | 3.1 (79) | 4.5 (2.0) |
| 3/8 | 1/2 | 2773B3037 | 3.6 | 5.3 | 4.1 (105) | 8.8 (224) | 3.1 (79) | 4.5 (2.0) |
| 1/2 | 1/2 | 2773B4047 | 3.3 | 5.3 | 4.1 (105) | 8.8 (224) | 3.1 (79) | 4.5 (2.0) |
| 1/2 | 1 | 2773B4037 | 10.0 | 13.0 | 4.9 (124) | 9.6 (243) | 3.6 (92) | 5.0 (2.3) |
| 3/4 | 1 | 2773B5037 | 12.0 | 15.0 | 4.9 (124) | 9.6 (243) | 3.6 (92) | 5.0 (2.3) |
| 1 | 1 | 2773B6047 | 12.0 | 16.0 | 4.9 (124) | 9.6 (243) | 3.6 (92) | 5.0 (2.3) |
| 1 | 1½ | 2773A6037 | 23.0 | 34.0 | 6.6 (168) | 10.6 (268) | 4.8 (123) | 8.8 (4.0) |
| 1¼ | 1½ | 2773A7037 | 30.0 | 32.0 | 6.6 (168) | 10.6 (268) | 4.8 (123) | 8.8 (4.0) |
| 1½ | 1½ | 2773A8047 | 30.0 | 31.0 | 6.6 (168) | 10.6 (268) | 4.8 (123) | 8.8 (4.0) |
| **Internal Pressure Controlled** | | | | | | | | |
| 1/4 | 1/2 | 2783C2037 | 2.5 | 3.1 | 4.1 (105) | 5.7 (146) | 3.1 (79) | 4.5 (2.0) |
| 3/8 | 1/2 | 2783C3037 | 3.6 | 5.3 | 4.1 (105) | 5.7 (146) | 3.1 (79) | 4.5 (2.0) |
| 1/2 | 1/2 | 2783C4047 | 3.3 | 5.3 | 4.1 (105) | 5.7 (146) | 3.1 (79) | 4.5 (2.0) |
| 1/2 | 1 | 2783C4037 | 10.0 | 13.0 | 4.9 (124) | 7.1 (180) | 3.6 (92) | 5.0 (2.3) |
| 3/4 | 1 | 2783C5037 | 12.0 | 15.0 | 4.9 (124) | 7.1 (180) | 3.6 (92) | 5.0 (2.3) |
| 1 | 1 | 2783C6047 | 12.0 | 16.0 | 4.9 (124) | 7.1 (180) | 3.6 (92) | 5.0 (2.3) |
| 1 | 1½ | 2783B6037 | 23.0 | 34.0 | 6.6 (168) | 7.4 (188) | 4.8 (123) | 8.8 (4.0) |
| 1¼ | 1½ | 2783B7037 | 30.0 | 32.0 | 6.6 (168) | 7.4 (188) | 4.8 (123) | 8.8 (4.0) |
| 1½ | 1½ | 2783B8047 | 30.0 | 31.0 | 6.6 (168) | 7.4 (188) | 4.8 (123) | 8.8 (4.0) |

**NOTE:** The 3/2 EEZ-ON® valve is also available with a L-O-X® adapter so that both L-O-X® and EEZ-ON® functions are consolidated in a single valve.

**For coordinating silencers, see MUFFL-AIR® Silencers (model numbers 5500A4003, 5500A6003 and 5500A8001), page 57.**

**STANDARD SPECIFICATIONS** (for valves on this page)**:**
**Ambient/Media Temperature:** 40° to 175°F (4° to 80°C).
**Power Consumption:** 87 VA holding on 50 or 60 Hz; 14 watts on DC.
**Flow Media:** Filtered air.
**Inlet Pressure:** *2/2 models:* 30 to 150 psig (2 to 10 bar).
*3/2 models:* 15 to 150 psig (1 to 10 bar).
***Body Paint:** Gold.
***Port Threads:** NPT standard, BSPP. For BSPP threads, add a "D" prefix to the model number, e.g., D2781A2007.

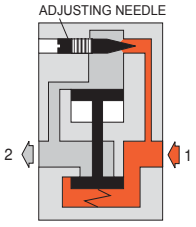
**IMPORTANT NOTE:** Please read carefully and thoroughly all of the **CAUTIONS** on the inside back cover.

# EEZ-ON® Valves Series 27

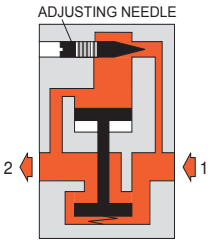
## VALVE OPERATION

### 2/2 Valve

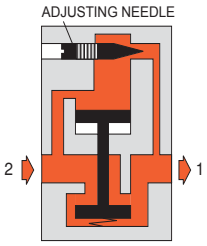
**AIR PRESSURE TO INLET**
When air pressure is first applied to the inlet, air flow to the piston is restricted by the adjustable needle in the delay orifice. Downstream air pressure gradually builds up at a rate determined by the setting of the adjustable needle.




**VALVE OPENS TO FULL FLOW**
When downstream air pressure reaches approximately 40 to 60 percent of inlet pressure, the valve element shifts to the full open position and there is full air flow to the downstream components. This condition continues as long as inlet air pressure is present.

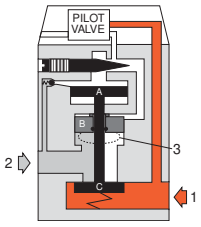



**INLET PRESSURE REMOVED**
When inlet pressure is removed, the exhausting downstream air pressure keeps the inlet poppet open until the downstream pressure drops by approximately 90 percent. The remaining pressure is exhausted via the delay orifice.

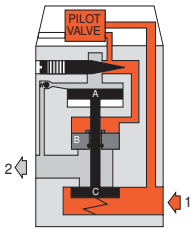



### 3/2 Valve

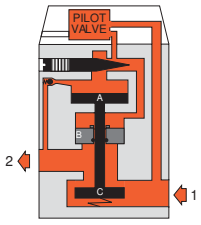
**PILOT NOT ENERGIZED**
Pilot air is blocked by the pilot. Any downstream pressure forces piston B (which slides on the valve stem) upward. This opens the exhaust port and vents the downstream line.



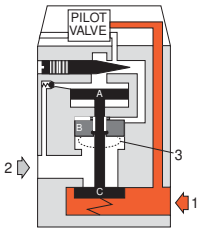

**PILOT ENERGIZED**
Pilot air forces piston B downward to close the exhaust port. Pilot air also flows past the adjusting needle, opens the ball check and begins slowly to pressurize the outlet line. At the same time, pressure is building up on piston A.



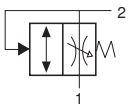

**FULL PRESSURE**
When the pressure on piston A reaches approximately 50 percent of inlet pressure, it is forced downward and opens inlet poppet C. Full inlet pressure now flows freely to the outlet port.



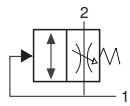

**PILOT DE-ENERGIZED**
Air above pistons A and B is exhausted through the exhaust port of the pilot valve. Air above poppet C forces sliding piston B upward so that the main exhaust port is opened and the pressurized air is exhausted.



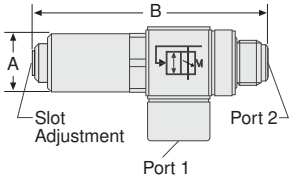

# Right-Angle EEZ-ON® Valves Series 19




Primary Pressure at Port 1




Primary Pressure at Port 2




EEZ-ON® Valves are used to gradually apply air pressure downstream when supply is initially applied. Select the model you need to operate with supply pressure at either port 1 or port 2. Right-angle design with Banjo for easy positioning of pipe or tubing.

**Models with Threaded Banjo**

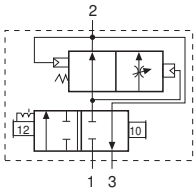
| Port Size | | Valve Model Numbers Primary Pressure | | Avg. | Dimensions inches (mm) | | Tightening Torque Max. |
|---|---|---|---|---|---|---|---|
| Port 1* | Port 2** | At Port 1 | At Port 2 | $C_v$ | A | B | Ft-lb (Nm) |
| 1/8 | 1/8 | 1969A1010 | 1969A1011 | 0.7 | 0.5 (13) | 2.3 (57) | 11.06 (15) |
| 1/4 | 1/4 | 1969A2010 | 1969A2011 | 1.1 | 0.7 (17) | 2.5 (63) | 14.75 (20) |
| 3/8 | 3/8 | 1969A3010 | 1969A3011 | 1.9 | 0.9 (22) | 2.5 (63) | 22.13 (30) |
| 1/2 | 1/2 | 1969A4010 | 1969A4011 | 2.2 | 1.1 (27) | 2.9 (74) | 29.50 (40) |
| G1/8 | G1/8 | D1969A1010 | D1969A1011 | 0.7 | 0.5 (13) | 2.3 (57) | 7.38 (10) |
| G1/4 | G1/4 | D1969A2010 | D1969A2011 | 1.1 | 0.7 (17) | 2.4 (61) | 8.85 (12) |
| G3/8 | G3/8 | D1969A3010 | D1969A3011 | 1.9 | 0.9 (22) | 2.7 (67) | 14.75 (20) |
| G1/2 | G1/2 | D1969A4010 | D1969A4011 | 2.2 | 1.1 (27) | 2.9 (72) | 22.13 (30) |

* Threads in port 1 are female.
** Port 2 threads are male.

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

# Manual L-O-X® Valves with EEZ-ON® Operation Series 15

3/8 - 3/4



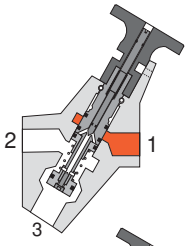

**The manual L-O-X® valve with EEZ-ON® operation combines shut-off certainty with gradual pressurization upon start-up. Special labels and adjustment screw indicates EEZ-ON® function.**

Combining two functions critical to safety concerns in any application, the ROSS manual L-O-X® valve with EEZ-ON® operation provides the shutdown and the gradual start-up (or, "soft start") capabilities today's systems require. In addition, because the manual L-O-X® valve with EEZ-ON® operation is two units in one, you eliminate the need for multiple components. And that means easier installation and less cost. The valve permits the gradual increase of downstream pressure in the pneumatic circuit that has just been actuated. The same unit also features a shut-off and lockout of system air to limit inadvertent actuation. For years, ROSS products have been the industry benchmark in safety-related pneumatic controls, and the tradition continues with the manual L-O-X® valve with EEZ-ON® operation. The exhaust port is threaded for the installation of a silencer or a line for remote exhausting. Two mounting holes are provided to simplify the installation of the L-O-X® valve with EEZ-ON® operation.

## VALVE OPERATION

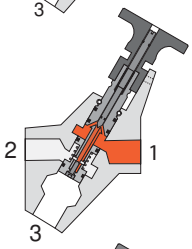
### VALVE CLOSED

With a short push of the blue handle inward, the flow of supply is blocked and downstream air is exhausted via the exhaust port at the bottom of the valve. It is required by OSHA that the L-O-X® valves with EEZ-ON® operation be padlocked in this position to prevent the handle from being pulled outward inadvertently when potential for human injury exists or servicing machinery.



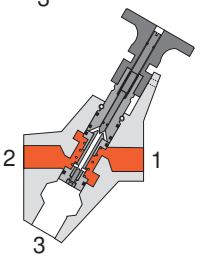

### EEZ-ON® VALVE FUNCTION

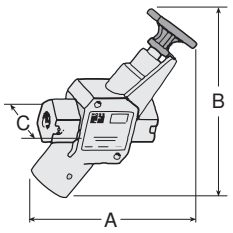
With the blue handle pulled out, the adjustable needle valve (accessed through top of handle) setting determines the rate of pressure buildup.




### VALVE OPEN

After the blue handle is pulled out and pressure downstream has gradually increased, the valve automatically changes to a fully open state, allowing full flow from inlet to downstream. Full flow is achieved at approximately 50% of inlet pressure.




| Port Size In-Out | Port Size Exh. | Valve Model Numbers* | Avg. Cv 1 to 2 | Avg. Cv 2 to 3 | Dimensions inches (mm) A | Dimensions inches (mm) B | Dimensions inches (mm) C | EEZ-ON® Valve Cv** | Weight lb (kg) |
|---|---|---|---|---|---|---|---|---|---|
| 3/8 | 3/4 | Y1523B3102 | 6.0 | 8.0 | 6.4 (163) | 8.8 (224) | 2.0 (51) | 0.6 | 1.5 (0.7) |
| 1/2 | 3/4 | Y1523B4102 | 7.1 | 8.3 | 6.4 (163) | 8.8 (224) | 2.0 (51) | 0.6 | 1.5 (0.7) |
| 3/4 | 3/4 | Y1523B5112 | 8.0 | 9.5 | 6.4 (163) | 8.8 (224) | 2.0 (51) | 0.6 | 1.5 (0.7) |
| 3/4 | 1¼ | Y1523B5102 | 12.0 | 10.9 | 7.7 (196) | 10.8 (274) | 2.3 (58) | 3.0 | 3.2 (1.5) |
| 1 | 1¼ | Y1523B6102 | 13.7 | 12.0 | 7.7 (196) | 10.8 (274) | 2.3 (58) | 3.0 | 3.2 (1.5) |
| 1¼ | 1¼ | Y1523B7112 | 16.2 | 12.8 | 7.7 (196) | 10.8 (274) | 2.3 (58) | 3.0 | 3.2 (1.5) |

**Cv from port 1 to port 2 during pressure buildup (before valve opens fully).

## L-O-X® Sensing Port

L-O-X® Sensing Port - Series 15 manual L-O-X® valves and manual L-O-X® valves with EEZ-ON® operation are now provided with 1/8 NPT sensing ports, enabling installation of a pressure sensing device such as the Pop-Up Indicator or Pressure Switch shown below. Standards suggest that machine design should include a method for verifying the release of energy after lockout.

The ROSS 988A30 Pop-Up Indicator is constructed for the industrial environment with a brass body and 1/8" NPT connection. It offers 360° visibility and a redundant verification feature. By pushing on the red plunger, the operator can "feel" the presence of pressure and verify that the indicator is performing its sensing function.

The ROSS 586A86 Pressure Switch offers an electronic pressure sensing option that can be integrated into a safety monitoring system, which confirms energy isolation throughout the circuit.

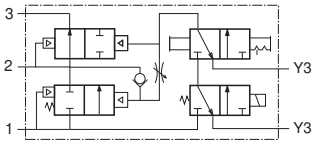
**STANDARD SPECIFICATIONS** (for valves on this page)**:**
**Ambient/Media Temperature:** 40° to 175°F (4° to 80°C).
**Flow Media:** Filtered air.
**Inlet Pressure:** 30 to 150 psig (2 to 10 bar).
***Body Paint:** Yellow.

***Port Threads:** NPT standard, BSPP. For BSPP threads, insert a "D" prefix to the model number, e.g., YD1523B3102.

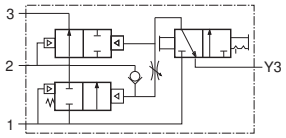
**NOTE:** Per specifications and regulations, these products are defined as energy isolation devices, **NOT AS EMERGENCY STOP DEVICES.**

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

# Manual L-O-X® Valves with EEZ-ON® Operation Series 27



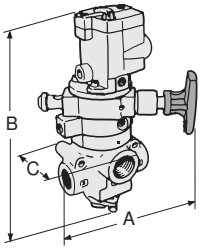

Solenoid Pilot Controlled



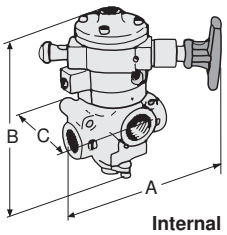

Internal Pressure Controlled

These unique valves give pneumatic circuits the soft start-up of the EEZ-ON® valves plus the lockout and exhaust capabilities of L-O-X® valves. They are available with either solenoid pilot or pressure control. ***Blue handle indicates that EEZ-ON® function is included*** *(L-O-X® valves with red handles do not have the EEZ-ON® function).*

| Port Size In-Out | Exh. | Valve Model Number* | Avg. Cv 1 to 2 | 2 to 3 | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|---|
| **Solenoid Pilot Controlled** | | | | | | | | |
| 1/4 | 1/2 | Y2773B2075 | 2.5 | 3.1 | 7.1(181) | 9.9 (253) | 6.5 (165) | 5.3 (2.4) |
| 3/8 | 1/2 | Y2773B3075 | 3.6 | 5.3 | 7.1(181) | 9.9 (253) | 6.5 (165) | 5.3 (2.4) |
| 1/2 | 1/2 | Y2773B4085 | 3.3 | 5.3 | 7.1(181) | 9.9 (253) | 6.5 (165) | 5.3 (2.4) |
| 1/2 | 1 | Y2773B4075 | 10.0 | 13.0 | 7.1 (181) | 10.6 (269) | 6.9 (175) | 6.0 (2.7) |
| 3/4 | 1 | Y2773B5075 | 12.0 | 15.0 | 7.1 (181) | 10.6 (269) | 6.9 (175) | 6.0 (2.7) |
| 1 | 1 | Y2773B6085 | 12.0 | 16.0 | 7.1 (181) | 10.6 (269) | 6.9 (175) | 6.0 (2.7) |
| 1 | 1½ | Y2773A6075 | 23.0 | 34.0 | 7.4 (188) | 11.6 (296) | 6.9 (175) | 9.5 (4.3) |
| 1¼ | 1½ | Y2773A7075 | 30.0 | 32.0 | 7.4 (188) | 11.6 (296) | 6.9 (175) | 9.5 (4.3) |
| 1½ | 1½ | Y2773A8085 | 30.0 | 31.0 | 7.4 (188) | 11.6 (296) | 6.9 (175) | 9.5 (4.3) |
| **Internal Pressure Controlled** | | | | | | | | |
| 1 | 1½ | Y2783A6055 | 23.0 | 34.0 | 7.4 (188) | 11.6 (296) | 6.9 (175) | 9.5 (4.3) |
| 1¼ | 1½ | Y2783A7055 | 30.0 | 32.0 | 7.4 (188) | 11.6 (296) | 6.9 (175) | 9.5 (4.3) |
| 1½ | 1½ | Y2783A8065 | 30.0 | 31.0 | 7.4 (188) | 11.6 (296) | 6.9 (175) | 9.5 (4.3) |



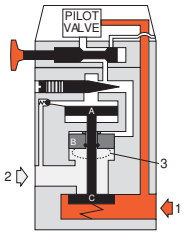

Solenoid Pilot Controlled



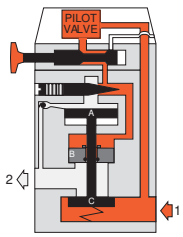

Internal Pressure Controlled

## VALVE OPERATION

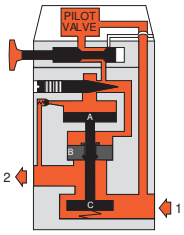
**L-O-X® handle open and pilot not energized.** Pilot air is blocked by the pilot. Any downstream pressure forces piston B (which slides on the valve stem) upward. This opens the exhaust port and vents the downstream line.



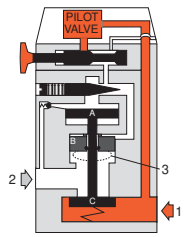

**L-O-X® handle open and pilot energized.** Pilot air forces piston B downward to close the exhaust port. Pilot air also flows past the adjusting needle, opens the ball check and begins slowly to pressurize the outlet line. At the same time, pressure is building up on piston A.




**Full Pressure.** When the pressure on piston A reaches approximately 50 percent of inlet pressure, it is forced downward and opens inlet poppet C. Full inlet pressure now flows freely to the outlet port.




**L-O-X® handle closed.** At any time the L-O-X® handle can be pushed inward, thereby closing off the flow of pilot air. Pilot air above pistons A and B is then vented to atmosphere. Piston A moves upward and closes inlet poppet C. Sliding piston B also moves upward to open the exhaust port and vents the downstream line.




For coordinating silencers, see MUFFL-AIR® Silencers (model numbers 5500A4003, 5500A6003, 5500A8001 and 5500A9002), page 57.

**STANDARD SPECIFICATIONS** (for valves on this page)**:**
**Solenoid Pilot Ambient Temperature:** 40° to 120°F (4° to 50°C).
**Solenoid Pilot Media Temperature:** 40° to 175°F (4° to 80°C).
**Internal Air Pilot Ambient/Media Temperature:**
40 to 175°F (4 to 80°C).
**Flow Media:** Filtered air.
**Inlet Pressure:** 42 to 150 psig (2.8 to 10 bar).
***Body Paint:** Yellow.
***Port Threads:** NPT, BSPP. For BSPP threads, add a "D" prefix to the model number, e.g., DY2773B2075.
**NOTE:** Per specifications and regulations, these products are defined as energy isolation devices, **NOT AS EMERGENCY STOP DEVICES.**

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

# Modular L-O-X®

## Air Entry Combination
## Lockout Valve with Integrated Filter/Regulator

**Ports: 1/4, 3/8, 1/2**
**Flow to 105 scfm**

The Modular L-O-X® Air Entry is a combination Lockout Valve with Integrated Filter/Regulator in a high flow, compact space saving design. Full flow exhaust meets all the applicable standards.

**FEATURES:**

- Filter and regulator consolidated into a single space-saving assembly
- Modular mounting for easy servicing
- Internal automatic drain; optional manual drain or float drain (metal bowl only)
- Reverse flow, self-relieving piston-type regulator; non-relieving optional
- Tamper-resistant pressure setting
- Has a visible indicator of pressure release (verification port)
- Only lockable in the off position
- Has a full size exhaust port (equal to or larger than supply)
- Easy to operate (positive push/pull operation-detented)
- Optional EEZ-ON® operation available

## HOW TO ORDER

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

MD3 **53P** **B** **A** B **4** **B** **B** **–**

**BOWL SIZE**
53P - Polycarbonate Bowl (4 oz)
53M - Metal Bowl with sight gauge (6 oz)

**ELEMENT TYPE**
A - 40 Micron
B - 5 Micron; standard

**BOWL DRAIN**
A - Auto Drain/Differential Pressure
M - Manual Drain
F - Float Drain (metal bowl only)

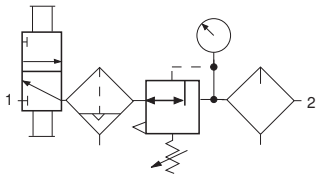
**PIPE SIZE**
2 - 1/4 NPTF
3 - 3/8 NPTF
4 - 1/2 NPTF
C - 1/4 BSPP
D - 3/8 BSPP
E - 1/2 BSPP

**ADJUSTMENT RANGE**
A - 0-150 psig (0-10 bar); reverse flow
B - 0-100 psig (0-6.8 bar); standard, reverse flow
C - 0-50 psig (0-3.4 bar); reverse flow

**GAUGE**
A - No Gauge
B - (0-200 psig)
C - (0-60 psig)
D - No Gauge with Panel Mount Nut
E - (0-200 psig) Gauge with Panel Mount Nut
F - (0-60 psig) Gauge with Panel Mount Nut

**ADD ON L-O-X®**
1 - Outlet Side
2 - Inlet Side
3 - L-O-X® with EEZ-ON® on Outlet Side
4 - L-O-X® with EEZ-ON® on Inlet Side
X - no L-O-X®

**Lockout/Filter/Regulator**
**ISO Symbol**
Lockout
Automatic Drain
Self-relieving




**APPLICATIONS:**
Packaging • Material handling • Conveyor panels • All Air Entry points

**STANDARD SPECIFICATIONS** (for valves on this page)**:**
**Ambient/Media Temperature:**
Plastic or Metal bowl: 40° to 125°F (4° to 52°C).
**Body:** Zinc.
**Bonnet:** Acetal.
**Bowl:** 4-oz (120-ml) polycarbonate plastic with zinc shatterguard; optional zinc bowl with clear nylon sight glass (6-oz).
**Bowl Drain:** Internal automatic drain; optional manual drain or float drain (metal bowl only).
**Cap Color:** Black.
**Filter Element:** 5-micron rated polyethylene filter element; optional 40-micron element.
**Fluid Media:** Filtered air.
**Inlet Pressure:** 15 psig (1 bar) minimum with automatic drain.
**Plastic bowl:** 150 psig (10 bar).
**Metal bowl:** 200 psig (14 bar).
**Outlet Pressure:** Adjustable up to 150 psig (10 bar); optional adjusting springs.
**Pressure Adjustment:** Removable, knob.
**Pressure Gauge**: 0 to 200 psig (14 bar); 1/4 NPT gauge ports front and rear; 0-60 psig (4 bar) optional.
**Panel Mounting:** 1.56 inch (37.1 mm) hole required.
**Ports:** Tapped inlet, outlet and exhaust ports.
**Seals/Elastomers:** Nitrile.
**Valve:** Brass.
**Valve Color:** Yellow body, red lockout slide.
**Slide:** Acetal.
**Threads:** NPT standard, BSPP.

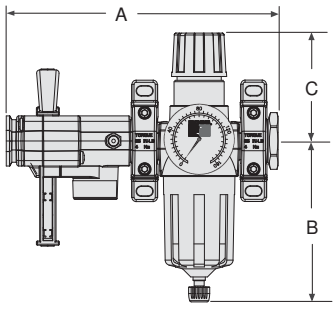
**IMPORTANT NOTE:** Please read carefully and thoroughly all of the **CAUTIONS** on the inside back cover.

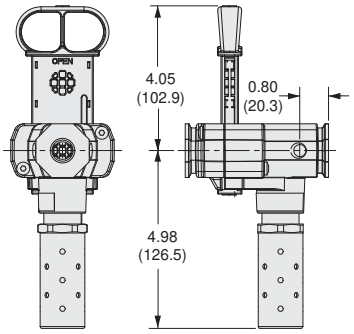
# Modular L-O-X®

## Air Entry Combination
## Lockout Valve with Integrated Filter/Regulator

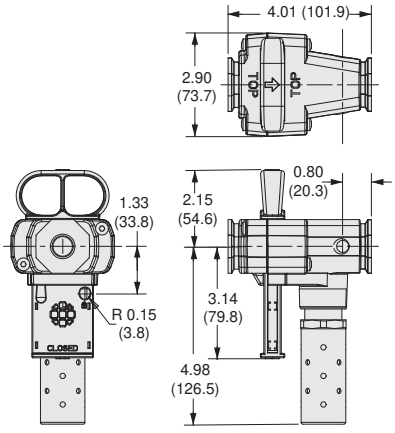
| Bowl | DIMENSIONS inches (mm) A | B * | C ** | Depth † | Weight † lb (kg) |
|---|---|---|---|---|---|
| Polycarbonate | 7.7 (195.6) | 4.81 (122.2) | 3.23 (82.0) | 2.9 (73.7) | 3.12 (1.4) |
| Metal | 7.7 (195.6) | 6.43 (163.4) | 3.23 (82.0) | 2.9 (73.7) | 3.18 (1.4) |

* Bowl removal clearance: add 3.1 (79).
** Dome removal clearance: add 0.63 (16).
† Less gauge.



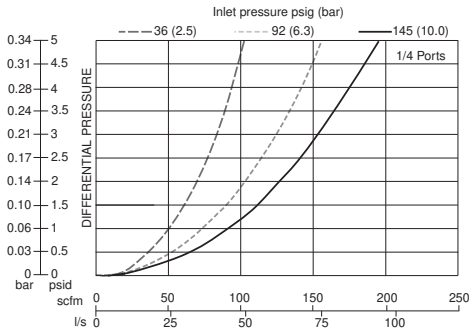



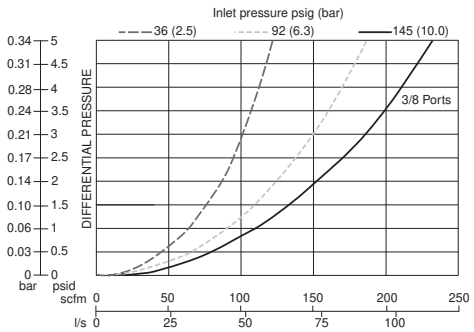

Valve in Open Position

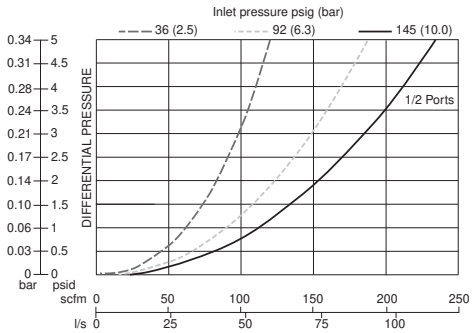



Valve in Closed Position

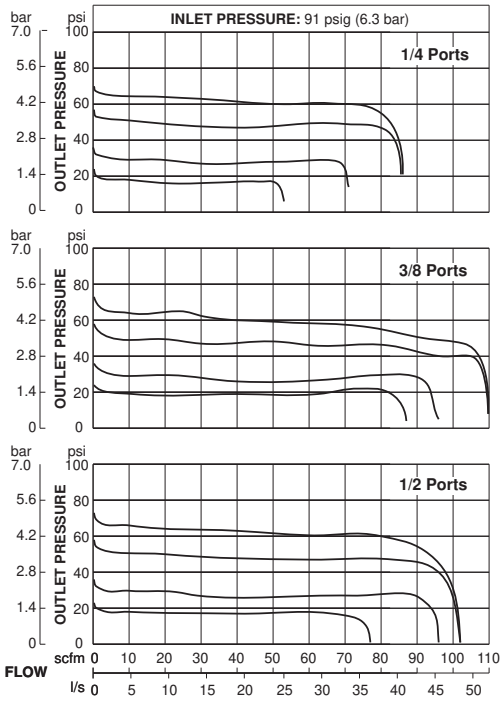
### LOCKOUT VALVE FLOW CHARACTERISTICS




### FILTER/REGULATOR FLOW CHARACTERISTICS



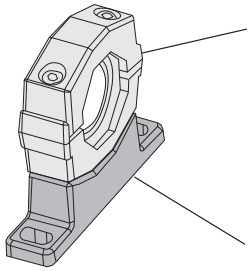

### REPLACEMENT FILTER ELEMENT KITS

| Element Rating | Kit Number |
|---|---|
| 5-µm (Std. element) | 936K77 |
| 40-µm | 938K77 |

Accessories not included with the product, see page 74 for accessories.

# Modular L-O-X®

## ACCESSORIES for AIR ENTRY COMBINATION



**Module Connecting Clamp Part No. R-A118-105**

**Combined Clamp & Bracket Part No. R-A118-105M**

**Mounting Bracket Part No. R-A118-103**

### CLAMP for MODULE CONNECTIONS

Specially designed clamps provide a quick and easy assembly or disassembly of MD3 modules. Two allen-head bolts quickly tighten or loosen the clamp using a 5/32 or 4mm hex key. The clamp contains a plate carrying two O-rings to provide positive sealing between modules.

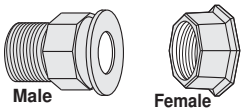
Order clamp by part number **R-A118-105**.
Combined clamp and bracket (below) can be ordered by part number **R-A118-105M**.

### MOUNTING BRACKET

Two brackets are normally used to mount an FRL to a vertical surface. The mounting bracket attaches to the module-connecting clamp (see above) with a single screw. Each bracket then employs two bolts (1/4" or 6mm) to connect the assembly to the mounting surface.

Order bracket and screw by part number **R-A118-103**.
Combined bracket and clamp (above) can be ordered by part number **R-A118-105M**.

### MALE and FEMALE END PORTS



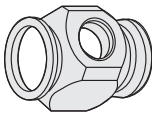
**Male** **Female**

Either male or female end ports can be attached to threaded inlet and outlet lines. This allows all modules of an FRL assembly to be removed easily and quickly without having to unthread the end modules. The end ports are attached to the modules with clamps (see at left). End ports can be included in an assembled FRL or ordered separately by the following part numbers:

| Port Size | Male Number | Female Number |
|---|---|---|
| 1/4 NPTF | **R-118-109-2F** | **R-118-100-2** |
| 3/8 NPTF | **R-118-109-3F** | **R-118-100-3** |
| 1/2 NPTF | **R-118-109-4F** | **R-118-100-4** |
| 3/4 NPTF | **R-118-109-6F** | **R-118-100-6** |

### EXTRA PORT BLOCK

An extra port block can be placed between modules to provide two auxiliary 1/4 NPTF ports. Its mounting position can be rotated to obtain the most convenient operating orientation. If only one auxiliary port is to be used, the unused port must be closed with a pipe plug. (The inlet and outlet are not threaded.)



| Port Size | Part Number |
|---|---|
| 1/4 NPTF | **R-118-106-2** |
| 3/8 NPTF | **R-118-106-3** |
| 1/2 NPTF | **R-118-106-4** |

### PNEUMATIC ENERGY RELEASE VERIFICATION OPTION

| Verification Option | Model Number | Inlet Port Size* |
|---|---|---|
| Pop-Up Indicator | 988A30 | 1/8 |
| Pressure Switch | 586A86 | 1/8 |

* NPT port threads.

**Pop-Up Indicator**

**Pressure Switch**

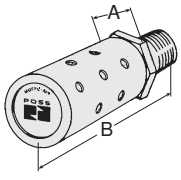
### SILENCER

**MUFFL-AIR® Silencer**

| Port Size | Model Numbers* | Avg. $C_v$ | Dimensions inches (mm) A | B | Weight lb (kg) |
|---|---|---|---|---|---|
| 3/4 | 5500A5013 | 7.0 | 1.3 (32) | 3.8 (96) | 0.5 (0.2) |

*NPT port treads, Male.

**MUFFL-AIR® Silencer**




**Male Pipe Threads**

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

# Sensing Valves Series SV27

## With Position and State Sensing Feedback for Safety Applications

EN 954-1, ISO 13849-1, & AS4024-1
(3/4 bodies only, other sizes approval pending)

CONTROL CATEGORY 2

**3/2 Normally Closed, Solenoid Pilot Controlled Model**

ROSS' new Series SV27 sensing valves, based upon the proven Series 27 valve family, combine the tough, dirt tolerant characteristics of poppet technology with sensing for actual poppet position and state.

Electrical feedback is provided via a positively-driven, safety-rated DPST (Double-Pole Single-Throw) switch with both normally open (NO) and normally closed (NC) contacts. For 3/4 and 1¼ bodies, the DPST switch is actuated whenever the valve is not in the normal home position. For size 2 body, the DPST switch is only actuated whenever the valve is in the normal home position.

Enhanced safety can be achieved by installing an optional visual pressure indicator (988A30) or pressure switch kit (608A86) into the 1/8 NPT pressure verification port (PV) for verification of pressure release.

These new sensing valves are available in 2/2 and 3/2 normally closed functions with single solenoid pilot or pressure controlled pilot actuation.

**FEATURES:**

- Pressure Controlled and Solenoid Pilot Controlled versions
- Senses poppet position & state
- Electrical feedback via DPST switch (Double-Pole Single-Throw)
- Directly operated safety-rated force-guided positive-break status switch (DPST)
- Positive-break on 3/4 and 1¼ body valves
- Poppet construction for near zero leakage & high dirt tolerance
- Applications include air dump and trapped-pressure release

# Series SV27 Pilot Operated Check Sensing Valves

## Position and State Sensing Feedback for Category 2 & 3 Safety Applications Load Holding

EN 954-1, ISO 13849-1, & AS4024-1
(3/4 bodies only, other sizes approval pending)

CONTROL CATEGORY 2

**2/2 SV27 PO Check Pressure Controlled**

CONTROL CATEGORY 3

**2/2 Redundant SV27 PO Check Pressure Controlled**

ROSS' new Series SV27 Pilot Operated Check sensing valves, based upon the proven Series 27 valve family, combine the tough, dirt tolerant characteristics of poppet technology with sensing for actual internal position and state.

Electrical feedback is provided via a positively-driven, safety-rated DPST (Double-Pole Single-Throw) switch with normally open (NO) contacts. The DPST switch is actuated whenever the valve is not in the normal home position.

Enhanced safety can be achieved by installing an optional visual pressure indicator (988A30) or pressure switch kit (608A86) into the 1/8 NPT pressure verification port (PV) for verification of pressure release.

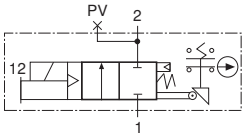
These new Sensing Valves are available in 2/2 normally closed functions with single or double solenoid pilot or pressure control actuation.

**FEATURES:**

- Pressure Controlled and Solenoid Pilot Controlled versions
- Poppet construction for near zero leakage & high dirt tolerance
- Directly operated safety-rated force-guided positive-break status switch (DPST)
- Holds a vertical load in the event of loss of air pressure (and electrical power with solenoid pilot controlled models)

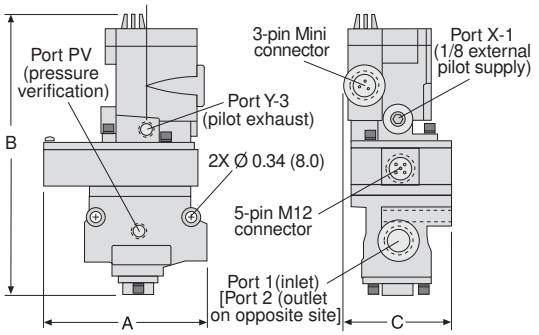
# Solenoid Pilot Controlled Sensing Valves Series SV27

## 2/2 Valves

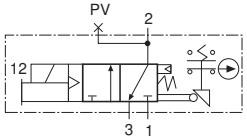



| Port Size | Valve Model Number | $C_v$ 1 - 2 | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|
| 1/2 | SV27NC105407PSAA1A** | 7.7 | 5.7 (145) | 9.3 (235) | 3.1 (77) | 4.6 (2.1) |
| 3/4 | SV27NC105507PSAA1A** | 9.0 | 5.7 (145) | 9.3 (235) | 3.1 (77) | 4.6 (2.1) |
| 1 | SV27NC105607PSAA1A** | 9.0 | 5.7 (145) | 9.3 (235) | 3.1 (77) | 4.6 (2.1) |
| 1 | SV27NC107607PSAA1A** | 24 | 6.8 (173) | 12.0 (303) | 4.9 (123) | 8.1 (3.7) |
| 1¼ | SV27NC107707PSAA1A** | 29 | 6.8 (173) | 12.0 (303) | 4.9 (123) | 8.1 (3.7) |
| 1½ | SV27NC107807PSAA1A** | 29 | 6.8 (173) | 12.0 (303) | 4.9 (123) | 8.1 (3.7) |

** "1A"=120 volts, 60 Hz solenoids. For 240 volts, 60 Hz, change "1A" to "2A"; for 24 volts, 60 Hz, change to "3A" ; for 24 volts DC, change to "1D".

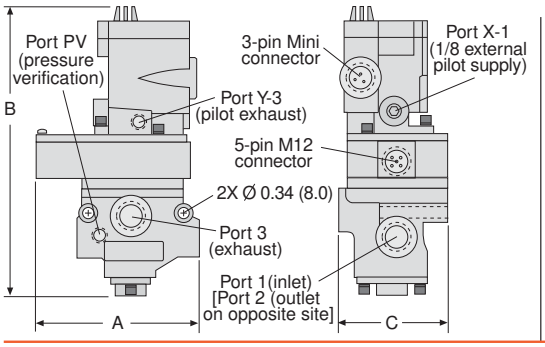


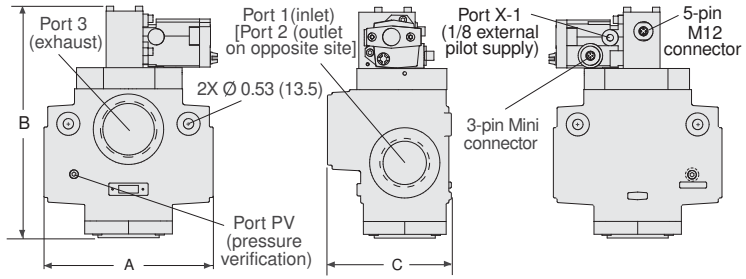

## 3/2 Valves




| Port Size 1, 2 | Port Size 3 | Valve Model Number | $C_v$ 1 - 2 | $C_v$ 3 | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|---|
| 1/2 | 1 | SV27NC305407PSAA1A** | 6.3 | 9.2 | 5.7 (145) | 9.6 (244) | 3.1 (77) | 4.5 (2.0) |
| 3/4 | 1 | SV27NC305507PSAA1A** | 7.7 | 11 | 5.7 (145) | 9.6 (244) | 3.1 (77) | 4.5 (2.0) |
| 1 | 1 | SV27NC305607PSAA1A** | 8.0 | 12 | 5.7 (145) | 9.6 (244) | 3.1 (77) | 4.5 (2.0) |
| 1 | 1½ | SV27NC307607PSAA1A** | 23 | 34 | 6.8 (173) | 12.0 (303) | 4.9 (123) | 7.8 (3.5) |
| 1¼ | 1½ | SV27NC307707PSAA1A** | 30 | 32 | 6.8 (173) | 12.0 (303) | 4.9 (123) | 7.8 (3.5) |
| 1½ | 1½ | SV27NC307807PSAA1A** | 30 | 31 | 6.8 (173) | 12.0 (303) | 4.9 (123) | 7.8 (3.5) |
| 1½ | 2½ | SV27NC309807PSAA1A** | 68 | 70 | 8.7 (219) | 11.8 (300) | 6.4 (161) | 18.1 (8.2) |
| 2 | 2½ | SV27NC309907PSAA1A** | 70 | 70 | 8.7 (219) | 11.8 (300) | 6.4 (161) | 18.1 (8.2) |
| 2½ | 2½ | SV27NC309957PSAA1A** | 70 | 71 | 8.7 (219) | 11.8 (300) | 6.4 (161) | 18.1 (8.2) |

** "1A"=120 volts, 60 Hz, solenoids. For 240 volts, 60 Hz, change "1A" to "2A"; for 24 volts, 60 Hz, change to "3A" ; for 24 volts DC, change to "1D".



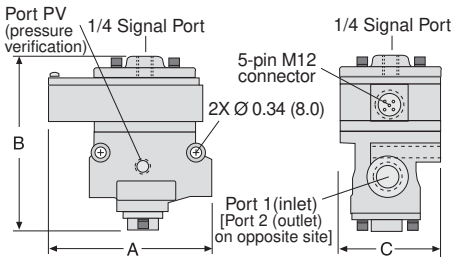



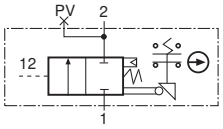

**STANDARD SPECIFICATIONS** (for valves on this page)**:**
**Solenoid Pilot:** AC or DC power. Rated for continuous duty.
**Standard Voltages:** 100–110 volts, 50 Hz; 100–120 volts, 60 Hz; 24 volts DC, 110 volts DC. For other voltages, consult ROSS.
**Power Consumption:** 87 VA inrush, 30 VA holding on 50 or 60 Hz; 14 watts on DC.
**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 (2.8 to 10 bar).
**Pilot Pressure:** Must be equal to or greater than inlet pressure.
**Switch Current/Voltage Max.:** 2.5 A/120 volts AC.
**Switch Current/Voltage Min.:** 50 mA/24 volts DC.
**Port Treads:** NPT standard. For BSPP threads, replace "N" in the model number with a "D", e.g., SV27DC105407PSAA1A.
*NOTE: Electrical life of switch varies with conditions and voltage; rated in excess of 15 million cycles.*

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

# Pressure Controlled Sensing Valves Series SV27

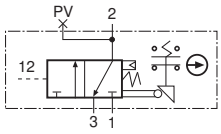
## 2/2 Valves

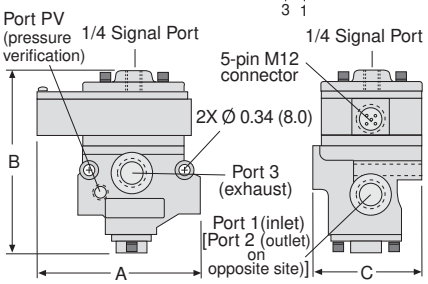



| Port Size | Valve Model Number | $C_v$ 1 - 2 | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|
| 1/2 | SV27NC105405ASAA | 7.7 | 5.7 (145) | 6.1 (155) | 3.1 (79) | 3.4 (1.6) |
| 3/4 | SV27NC105505ASAA | 9.0 | 5.7 (145) | 6.1 (155) | 3.1 (79) | 3.4 (1.6) |
| 1 | SV27NC105605ASAA | 9.0 | 5.7 (145) | 6.1 (155) | 3.1 (79) | 3.4 (1.6) |
| 1 | SV27NC107605ASAA | 24 | 6.8 (173) | 8.7 (220) | 4.1 (105) | 6.7 (3.0) |
| 1¼ | SV27NC107705ASAA | 29 | 6.8 (173) | 8.7 (220) | 4.1 (105) | 6.7 (3.0) |
| 1½ | SV27NC107805ASAA | 29 | 6.8 (173) | 8.7 (220) | 4.1 (105) | 6.7 (3.0) |

## 3/2 Valves

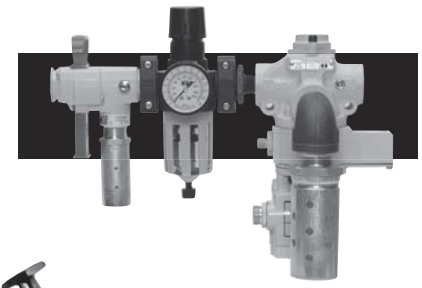


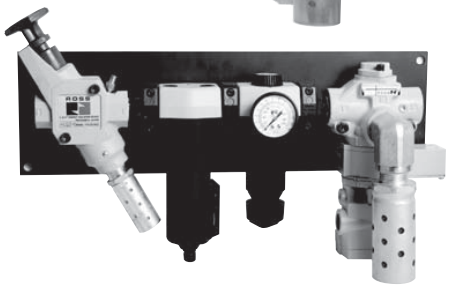




| Port Size 1, 2 | 3 | Valve Model Number | $C_v$ 1 - 2 | 3 | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|---|
| 1/2 | 1 | SV27NC305405ASAA | 6.3 | 9.2 | 5.7 (145) | 6.4 (163) | 3.6 (91) | 3.3 (1.5) |
| 3/4 | 1 | SV27NC305505ASAA | 7.7 | 11 | 5.7 (145) | 6.4 (163) | 3.6 (91) | 3.3 (1.5) |
| 1 | 1 | SV27NC305605ASAA | 8.0 | 12 | 5.7 (145) | 6.4 (163) | 3.6 (91) | 3.3 (1.5) |
| 1 | 1½ | SV27NC307605ASAA | 23 | 34 | 6.8 (173) | 8.8 (222) | 4.9 (123) | 6.4 (2.9) |
| 1¼ | 1½ | SV27NC307705ASAA | 30 | 32 | 6.8 (173) | 8.8 (222) | 4.9 (123) | 6.4 (2.9) |
| 1½ | 1½ | SV27NC307805ASAA | 30 | 31 | 6.8 (173) | 8.8 (222) | 4.9 (123) | 6.4 (2.9) |
| 1½ | 2½ | SV27NC309805ASAA | 68 | 70 | 8.7 (219) | 11.8 (300) | 6.4 (161) | 17.2 (7.8) |
| 2 | 2½ | SV27NC309905ASAA | 70 | 70 | 8.7 (219) | 11.8 (300) | 6.4 (161) | 17.2 (7.8) |
| 2½ | 2½ | SV27NC309955ASAA | 70 | 71 | 8.7 (219) | 11.8 (300) | 6.4 (161) | 17.2 (7.8) |

**STANDARD SPECIFICATIONS** (for valves on this page)**:**
**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 (2.8 to 10 bar).
**Pilot Pressure:** Must be equal to or greater than inlet pressure.
**Switch Current/Voltage Max.:** 2.5 A/120 volts AC.
**Switch Current/Voltage Min.:** 50 mA/24 volts DC.
**Port Treads:** NPT standard. For BSPP threads, replace "N" in the model number with a "D", e.g., SV27DC105405ASAA.
*NOTE: Electrical life of switch varies with conditions and voltage; rated in excess of 15 million cycles.*

# Air Entry Packages with 3/2 Normally Closed Sensing Valve





CONTROL CATEGORY 2

- Pre-engineered panel-mounted design with air entry via filter and regulator "FR", or filter, regulator, and lubricator "FRL"
- Includes 3/2 Normally Closed Sensing Valve with features described above
- Applications include Air Dump and Trapped-Pressure Release

| Model Number* | Air Entry Type | Port Size In | Out | $C_v$ 1 to 2 | 2 to 3 | Dimensions (inches/mm) Length | Width | Depth |
|---|---|---|---|---|---|---|---|---|
| **Category 2 with Modular L-O-X® and SV27 Sensing Valve** | | | | | | | | |
| RC208-09 | FR | 1/2 | 1 | 6.3 | 9.2 | 14.8 (375) | 11.0 (279) | 6.6 (168) |
| RC208L-09 | FRL | 1/2 | 1 | 6.3 | 9.2 | 14.8 (375) | 11.0 (279) | 6.6 (168) |
| **Category 2 with Manual L-O-X® and SV27 Sensing Valve** | | | | | | | | |
| RC208-06 | FR | 1/2 | 1 | 6.3 | 9.2 | 23.0 (585) | 12.8 (326) | 6.7 (171) |
| RC212-06 | FR | 3/4 | 1 | 7.7 | 11 | 23.0 (585) | 12.8 (326) | 6.7 (171) |
| RC216-06 | FR | 1 | 1 | 8.0 | 12 | 28.0 (712) | 17.0 (432) | 9.5 (242) |
| RC208L-06 | FRL | 1/2 | 1 | 6.3 | 9.2 | 23.0 (585) | 12.8 (326) | 6.7 (171) |
| RC212L-06 | FRL | 3/4 | 1 | 7.7 | 11 | 23.0 (585) | 12.8 (326) | 6.7 (171) |
| RC216L-06 | FRL | 1 | 1 | 8.0 | 12 | 31.8 (808) | 17.0 (432) | 9.5 (242) |

* NPT port threads. Specify voltage and hertz when ordering, M12 connectors available, consult ROSS. The standard Air Entry Packages are supplied with metal bowl and auto drain.

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

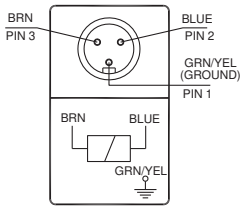
# Preassembled Wiring Kits for Sensing Valves Series SV27

The wiring kits for Series SV27 Sensing Valves are available in lengths of 4 or 10 meters, with a cord grip on each cable.
The kits for SV27 solenoid pilot controlled models come with 2 cables; one with a 3-pin MINI connector for the solenoid and one with a 5-pin M12 (Micro) connector for the sensing switch. The kits for the pressure controlled models include only one cable with a 5-pin M12 connector for the sensing switch.
(Note: Each cable has one connector.)

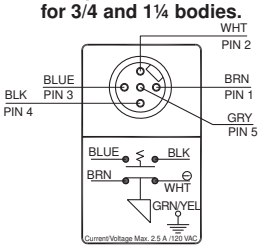
*For 3/4 and 1¼ inch bodies, the DPST switch is actuated whenever the valve is not in the normal home position. For 2 inch bodies, the DPST switch is only actuated whenever the valve is in the normal home position.

| Kit Number | Valve Type | Length (meters) | No. of Cables |
|---|---|---|---|
| 2239H77 | Solenoid Pilot | 4 | 2 |
| 2240H77 | Solenoid Pilot | 10 | 2 |
| 2241H77 | Pressure Controlled | 4 | 1 |
| 2242H77 | Pressure Controlled | 10 | 1 |

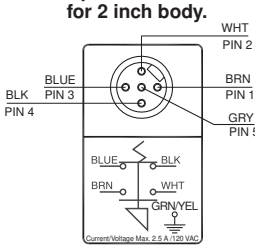
**Solenoid Cable with 3-pin MINI Connector**




**Sensing Switch Cable with 5-pin M12 Connector for 3/4 and 1¼ bodies.**

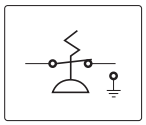



**Sensing Switch Cable with 5-pin M12 Connector for 2 inch body.**




**Optional Pressure Switch Kit (608A86)**

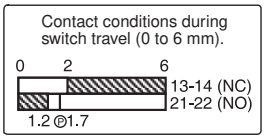
**Schematic**



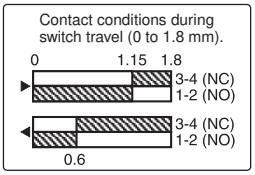
**Note:** Pressure switch closes on falling pressure of 5 psig.

**Integrated Double-Pole Single-Throw Switch (DPST)**

**Switch States for 3/4 and 1¼ bodies**




**Switch States for 2 inch body**

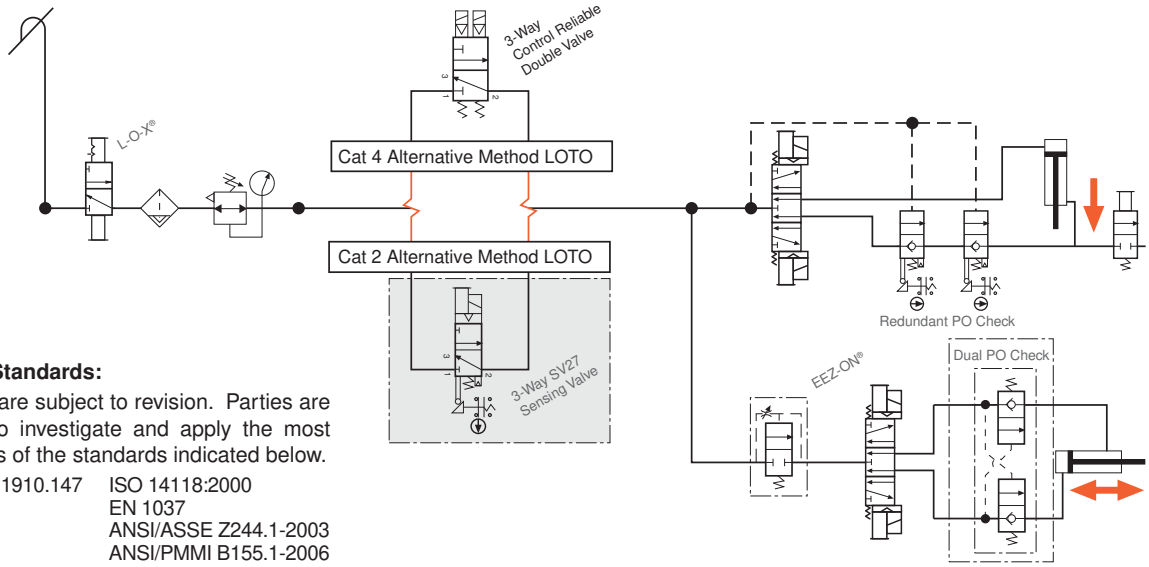



## General Illustration Safety-Related Applications

ROSS CONTROLS is the leader in safety-related pneumatic products. Shown here are a few examples of the variety of the ROSS safety-related products and their applications. Please contact us if you are interested in or confused about safety for your pneumatically operated equipment.

**ROSS Safety-Related Applications:**

* Cylinder hazard in 2 directions
* Pinch points
* Tooling or product damage
* Single point Lockout
* Press clutch/brake
* Counterbalance
* Monitored power systems
* Partial de-energization
* Vertical loads
* Cylinder hazard.




**Referenced Standards:**

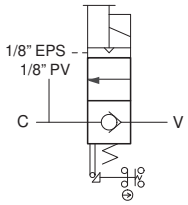
All standards are subject to revision. Parties are encouraged to investigate and apply the most recent editions of the standards indicated below.

OSHA 29 CFR 1910.147
CSA Z142-02
CSA Z460-05
ISO 13849-1
ISO 14118:2000
EN 1037
ANSI/ASSE Z244.1-2003
ANSI/PMMI B155.1-2006

**DISCLAIMER**
These circuits are illustrative only and not intended to be used literally for your application. Each machine is unique and has individual characteristics that must be considered when designing a safety circuit. In addition, the referenced standards are not an exhaustive list. There may be many additional local, state, national, and international standards as well as machine function specific standards pertinent to your machine. This document is not a substitute for a complete risk assessment of a machine's hazards, professional circuit design or acquiring an in depth understanding of standards/regulations relevant to an application or machine.

# Solenoid Pilot Controlled PO Check Sensing Valves Series SV27

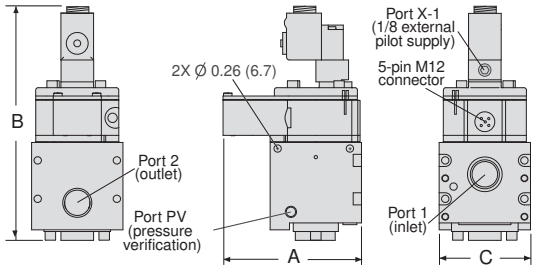
## 2/2 Valves



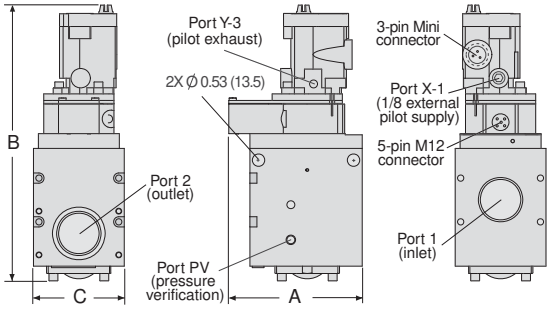

| Port Size | Valve Model Number* | $C_v$ 1 - 2 | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|
| 1/2 | SV27NC115408CSAA1A** | 4.5 | 5.0 (127) | 8.5 (215) | 3.3 (84) | 5.0 (2.3) |
| 3/4 | SV27NC115508CSAA1A** | 8.3 | 5.0 (127) | 8.5 (215) | 3.3 (84) | 5.0 (2.3) |
| 1 | SV27NC115608CSAA1A** | 10.3 | 5.0 (127) | 8.5 (215) | 3.3 (84) | 5.0 (2.3) |
| 1 | SV27NC117608CSAA1A** | 20 | 5.7 (145) | 11.8 (299) | 3.8 (99) | 12.5 (5.6) |
| 1¼ | SV27NC117708CSAA1A** | 29 | 5.7 (145) | 11.8 (299) | 3.8 (99) | 12.5 (5.6) |
| 1½ | SV27NC117808CSAA1A** | 33 | 5.7 (145) | 11.8 (299) | 3.8 (99) | 12.5 (5.6) |

** "1A"=120 volts, 60 Hz solenoids. For 24 volts DC, change "1A" to "1D".

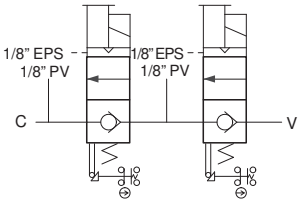
**Solenoid Pilot Controlled Model (CNOMO Style)**




**Solenoid Pilot Controlled Model (Pacer Style)**



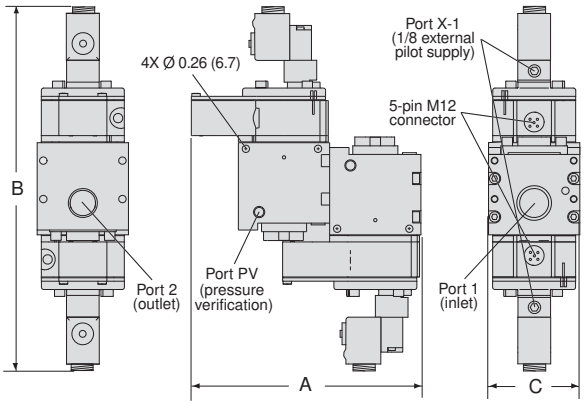

## 2/2 Valves Redundant



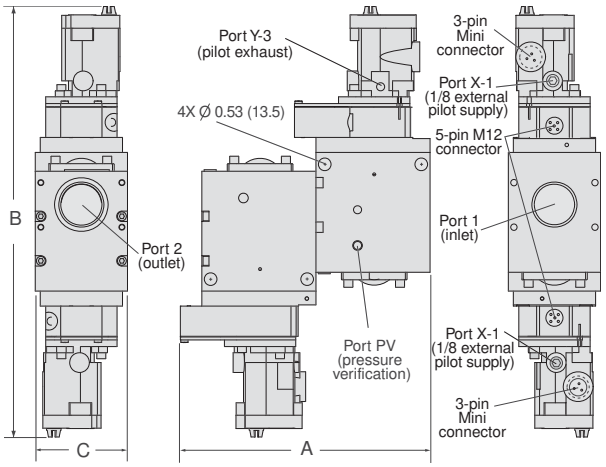

| Port Size | Valve Model Number* | $C_v$ 1 - 2 | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|
| 1/2 | SV27NC555408CSAA1A** | 3.8 | 8.3 (211) | 13.2 (335) | 3.3 (84) | 10.0 (4.5) |
| 3/4 | SV27NC555508CSAA1A** | 5.6 | 8.3 (211) | 13.2 (335) | 3.3 (84) | 10.0 (4.5) |
| 1 | SV27NC555608CSAA1A** | 8 | 8.3 (211) | 13.2 (335) | 3.3 (84) | 10.0 (4.5) |
| 1 | SV27NC557608CSAA1A** | 12 | 10.5 (267) | 18.1 (459) | 3.9 (99) | 25.0 (11.3) |
| 1¼ | SV27NC557708CSAA1A** | 19 | 10.5 (267) | 18.1 (459) | 3.9 (99) | 25.0 (11.3) |
| 1½ | SV27NC557808CSAA1A** | 22 | 10.5 (267) | 18.1 (459) | 3.9 (99) | 25.0 (11.3) |

** "1A"=120 volts, 60 Hz solenoids. For 24 volts DC, change "1A" to "1D".

**Solenoid Pilot Controlled Model (CNOMO Style)**



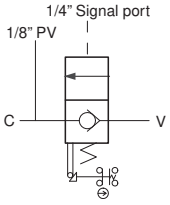

**Solenoid Pilot Controlled Model (Pacer Style)**



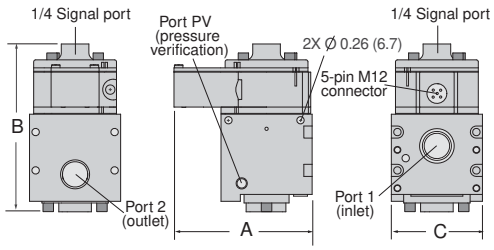

**STANDARD SPECIFICATIONS:** See page 80.

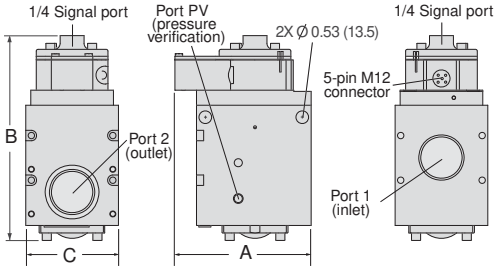
# Pressure Controlled PO Check Sensing Valves Series SV27

## 2/2 Valves

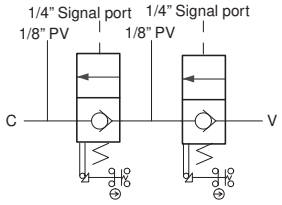



| Port Size | Valve Model Number* | $C_v$ 1 - 2 | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|
| 1/2 | SV27NC115405ASAA | 4.5 | 5.0 (127) | 6.1 (154) | 3.3 (84) | 4.0 (1.8) |
| 3/4 | SV27NC115505ASAA | 8.3 | 5.0 (127) | 6.1 (154) | 3.3 (84) | 4.0 (1.8) |
| 1 | SV27NC115605ASAA | 10.3 | 5.0 (127) | 6.1 (154) | 3.3 (84) | 4.0 (1.8) |
| 1 | SV27NC117605ASAA | 20 | 5.7 (145) | 8.6 (218) | 3.8 (99) | 11.0 (5.0) |
| 1¼ | SV27NC117705ASAA | 29 | 5.7 (145) | 8.6 (218) | 3.8 (99) | 11.0 (5.0) |
| 1½ | SV27NC117805ASAA | 33 | 5.7 (145) | 8.6 (218) | 3.8 (99) | 11.0 (5.0) |

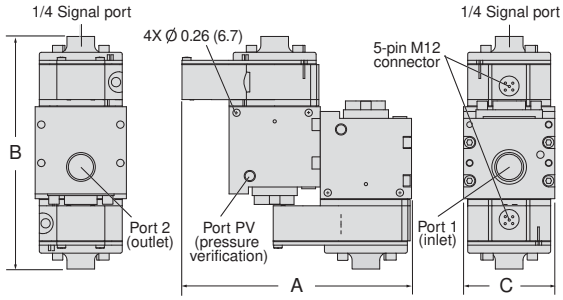


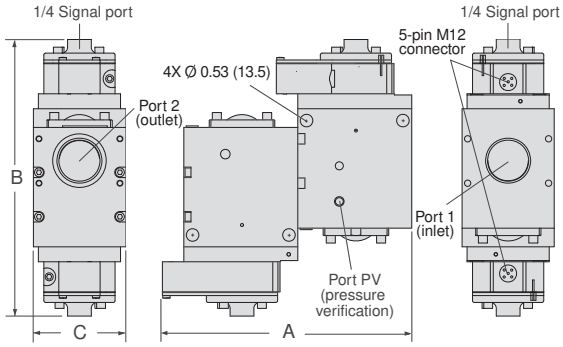




## 2/2 Valves Redundant




| Port Size | Valve Model Number* | $C_v$ 1 - 2 | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|
| 1/2 | SV27NC555405ASAA | 3.8 | 8.3 (211) | 8.5 (214) | 3.3 (84) | 9.0 (4.1) |
| 3/4 | SV27NC555505ASAA | 5.6 | 8.3 (211) | 8.5 (214) | 3.3 (84) | 9.0 (4.1) |
| 1 | SV27NC555605ASAA | 8 | 8.3 (211) | 8.5 (214) | 3.3 (84) | 9.0 (4.1) |
| 1 | SV27NC557605ASAA | 12 | 10.5 (267) | 11.7 (296) | 3.5 (88) | 22.0 (10.0) |
| 1¼ | SV27NC557705ASAA | 19 | 10.5 (267) | 11.7 (296) | 3.5 (88) | 22.0 (10.0) |
| 1½ | SV27NC557805ASAA | 22 | 10.5 (267) | 11.7 (296) | 3.5 (88) | 22.0 (10.0) |




**STANDARD SPECIFICATIONS** (for valves on this page and page 79)**:**
**Solenoid:** AC or DC power. Rated for continuous duty.
**Standard Voltages:** 120 volts AC, 60 Hz; 24 volts DC. For other voltages, consult ROSS.
**Power Consumption:** *CNOMO Style:* 11 VA inrush, 8.5 VA holding on 50 or 60 Hz; 6 watts on DC. *Pacer Style:* 87 VA inrush, 30 VA holding on 50 or 60 Hz; 14 watts on DC.
**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 (2.8 to 10 bar).
**Pilot Pressure:** Must be equal to or greater than inlet pressure.
**Switch Current/Voltage Max.:** 2.5 A/120 volts AC.
**Switch Current/Voltage Min.:** 50 mA/24 volts DC.
***NOTE:*** *Electrical life of switch varies with conditions and voltage; rated in excess of 15 million cycles.*
**Port Treads:** NPT standard. For BSPP threads, replace "N" in the model number with a "D", e.g., SV27DC115408CSAA1A.

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

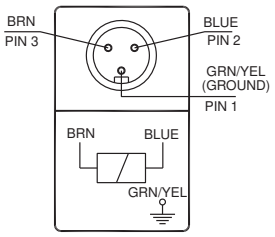
# Preassembled Wiring Kits for Sensing PO Check Valves Series SV27

The wiring kits for Series SV27 Sensing PO Check Valves are available in lengths of 4 or 10 meters, with a cord grip on each cable. The kits for SV27 PO Check solenoid pilot controlled models come with 2 cables; one with a 3-pin MINI connector for the solenoid and one with a 5-pin M12 (Micro) connector for the sensing switch. The kits for the air pilot controlled models include only one cable with a 5-pin M12 connector for the sensing switch. (Note: Each cable has one connector.)

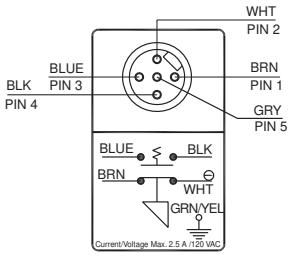
**For SV27 Redundant PO Check valves (CAT 3), order 2 kits.**

| Kit Number | Valve Type | Length (meters) | No. of Cables |
|---|---|---|---|
| 2239H77 | Solenoid Pilot | 4 | 2 |
| 2240H77 | Solenoid Pilot | 10 | 2 |
| 2241H77 | Pressure Controlled | 4 | 1 |
| 2242H77 | Pressure Controlled | 10 | 1 |

**Solenoid Cable with 3-pin MINI Connector**

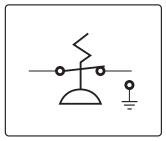



**Sensing Switch Cable with 5-pin M12 Connector.**




**Optional Pressure Switch Kit (608A86)**

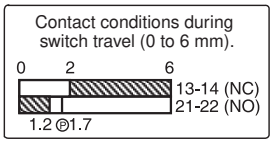
**Schematic**



**Note:** Pressure switch closes on falling pressure of 5 psig.

**Integrated Double-Pole Single-Throw Switch (DPST)**

**Switch States**

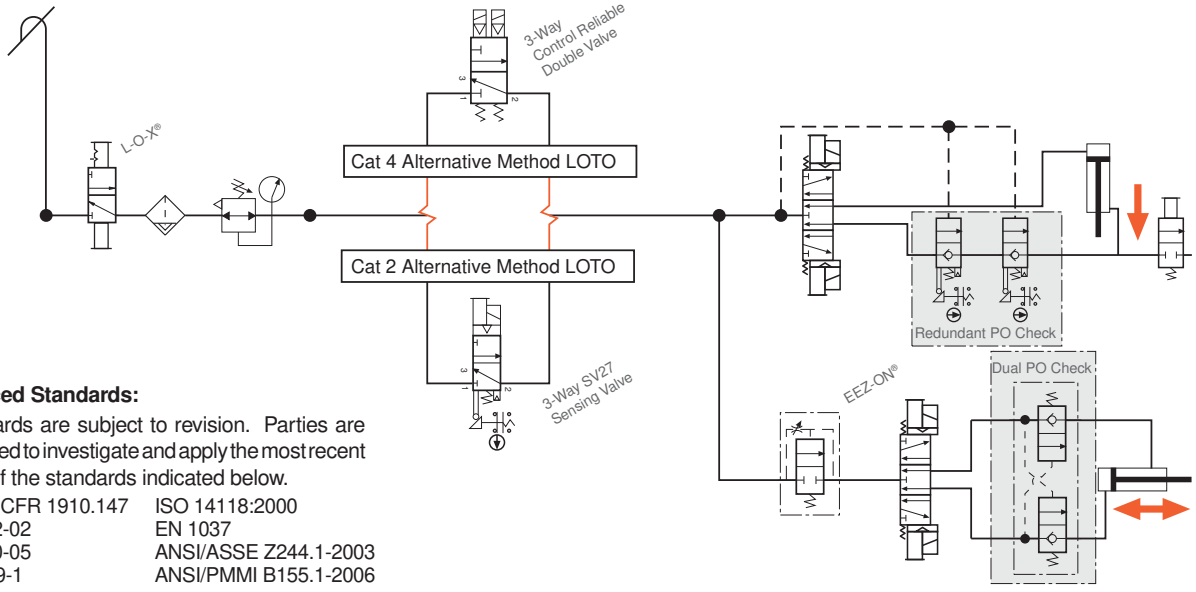



## General Illustration Safety-Related Applications

ROSS CONTROLS is the leader in safety-related pneumatic products. Shown here are a few examples of the variety of the ROSS safety-related products and their applications. Please contact us if you are interested in or confused about safety for your pneumatically operated equipment.

**ROSS Safety-Related Applications:**

* Cylinder hazard in 2 directions
* Pinch points
* Tooling or product damage
* Single point Lockout
* Press clutch/brake
* Counterbalance
* Monitored power systems
* Partial de-energization
* Vertical loads
* Cylinder hazard




**Referenced Standards:**

All standards are subject to revision. Parties are encouraged to investigate and apply the most recent editions of the standards indicated below.

| | |
|---|---|
| OSHA 29 CFR 1910.147 | ISO 14118:2000 |
| CSA Z142-02 | EN 1037 |
| CSA Z460-05 | ANSI/ASSE Z244.1-2003 |
| ISO 13849-1 | ANSI/PMMI B155.1-2006 |

**DISCLAIMER**

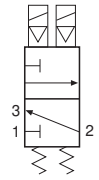
These circuits are illustrative only and not intended to be used literally for your application. Each machine is unique and has individual characteristics that must be considered when designing a safety circuit. In addition, the referenced standards are not an exhaustive list. There may be many additional local, state, national, and international standards as well as machine function specific standards pertinent to your machine. This document is not a substitute for a complete risk assessment of a machine's hazards, professional circuit design or acquiring an in depth understanding of standards/regulations relevant to an application or machine.

# DM[1] Series E

## Control Reliable Double Valves with Dynamic Monitoring

ISO 13849-1:2006 Category 3
PL e applications
(approval pending)

- **Dynamic Monitoring:** Monitoring and air flow control functions are integrated into two identical valve elements for CAT 3 applications. The valve exhausts downstream air if asynchronous movement of valve elements occurs during actuation or de-actuation, resulting in a residual outlet pressure of less than 1% of supply. If the abnormality clears itself, the valve will return to the ready-to-run state; there is no memory of the abnormal behavior, as in the ROSS DM[2]® Series E and DM[2]® Series C products that require an intentional reset following lockout.
- **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.
- **Ready-to-run:** If an abnormality clears itself upon the removal of electricity to both solenoids, it will be ready-to-run again. It does not remember the abnormality and stay in a locked-out state until intentionally reset. Therefore, cumulative abnormalities may go undetected.
- **Status Indicator:** The below products include a pressure switch with both NO and NC contacts to provide status feedback to the control system indicating whether the valve is in the "ready-to-run" condition or has experienced abnormal function. This indicator only reports status it is not part of a lockout function.
- **Silencers:** All models include high flow, clog resistant silencers.
- **Mounting:** Inline mounted with BSPP or NPT pipe threads. Inlet and outlet ports on both sides provide for flexible piping (plugs for unused ports included).



Simplified Schematic

| Port Sizes In-Out | Port Sizes Exh. | Valve Model Number* | Avg. $C_v$ In-Out | Avg. $C_v$ Exh. | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|---|
| 1/4 | 1/2 | DM1ENA20**31 | 1.34 | 2.43 | 4.96 (126.1) | 11.14 (283) | 4.87 (123.6) | 5.0 (2.27) |
| 3/8 | 1/2 | DM1ENA21**31 | 1.92 | 2.43 | 4.96 (126.1) | 11.14 (283) | 4.87 (123.6) | 5.0 (2.27) |

* NPT port threads. For BSPP threads , replace "N" in the model number with a "D".
** Insert voltage code: "A" = 24 volts DC; "B" = 110 volts AC, 50/60 Hz; "C" = 220 volts AC, 50/60 Hz; "D" = 12 volts DC.

***This valve is not designed for controlling clutch/brake mechanisms on mechanical power presses, see DM2® series D for mechanical power press applications.***

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

**Pilot Solenoid:** According to VDE 0580. Enclosure rating according to DIN 400 50 IP 65. Connector socket according to DIN 43650 Form A. Two solenoids, rated for continuous duty.

**Power Consumption (each solenoid):**

6.0 watts on DC; 15.8 VA inrush and 10.4 VA holding on AC.

**Standard Voltages:** 110 volts AC, 50/60 Hz; 220 volts AC, 50/60 Hz; 12 volts DC; 24 volts DC. For other voltages, consult ROSS.

**Ambient Temperature:** 15° to 122°F (4° to 50°C).

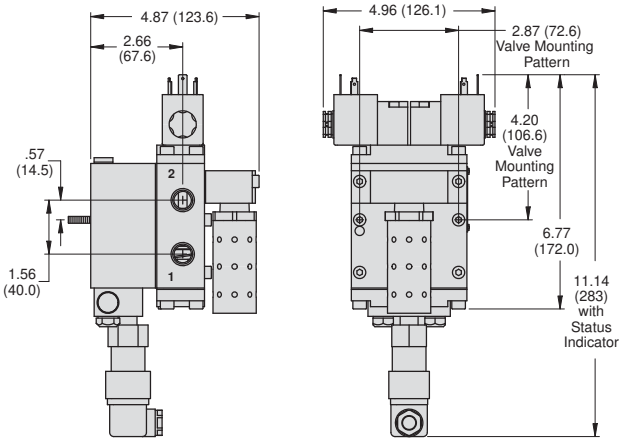
**Media Temperature:** 40° to 175°F (4° to 80°C).

**Flow Media:** Filtered, lubricated or unlubricated air (mineral oils according to DIN 51519, viscosity classes 32-46); 5 micron recommended.

**Inlet Pressure:** 30 to 116 psig (2 to 8 bar).

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

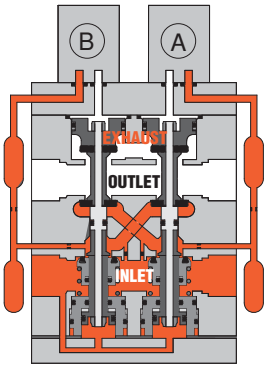
**DIMENSIONS –** inches (mm)



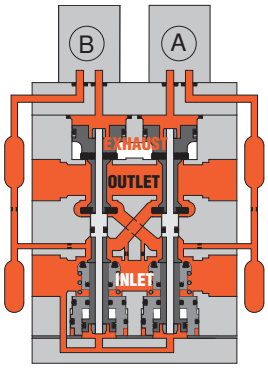

**IMPORTANT NOTE:** Please read carefully and thoroughly all of the **CAUTIONS** on the inside back cover.

# Overview of DM[1] Series E Double Valve Function

**Valve de-actuated (ready-to-run):**
The flow of inlet air pressure into the crossover passages from the inlet chamber is restricted by orifices that allow air pressure to bypass the lower inlet poppets. Flow is sufficient to quickly pressurize the pilot supply/timing chambers on both sides A and B. The upper inlet poppets prevent air flow from the crossover passages into the outlet chamber. Air pressure acting on the inlet poppets and return pistons securely hold the valve elements in the de-actuated position. (Internal air passages shown out of the valve body for clarity.)



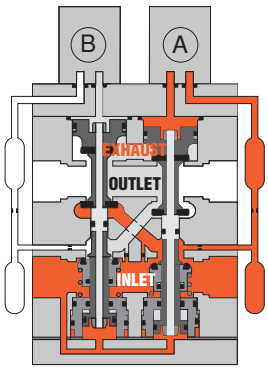
Valve ready-to-run



Valve actuated

**Valve actuated:**
Energizing the pilot solenoids simultaneously applies pressure to both pistons, forcing the internal parts to move to their actuated position, where inlet air flow to outlet is open and both exhaust poppets are closed. The outlet is then quickly pressurized, and pressure in the inlet, crossovers, outlet, and timing chambers are quickly equalized. De-energizing the main solenoids causes the valve elements to return to the ready-to-run (de-actuated) position.

**Asynchronous operation:**
If the valve elements operate in a sufficiently asynchronous manner on ACTUATION, the valve will shift into a position where one crossover and its related timing chambers will be exhausted, and the other crossover and its related timing chambers will be pressurized.
In the illustration, side B is in the de-actuated position, but has no pilot air available to actuate with and has full pressure on its upper and lower inlet poppets and return piston to hold it in place.



Valve in restricted outlet to exhaust state

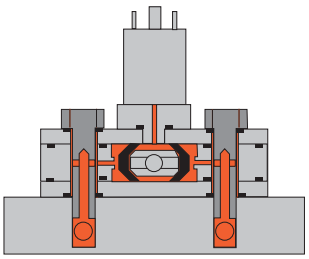
Inlet air flow on side B into its crossover is restricted and flows through the open upper inlet poppet on side A, through the outlet into the exhaust port, and from the exhaust port to atmosphere. Residual pressure in the outlet is less than 1% of inlet pressure.

Once the main solenoids are de-energized, actuating pressure is removed from the top of the main pistons and then the lower inlet poppet return spring along with inlet air pressure acting on the side A return piston will push side A back into the de-actuated position. Inlet air pressurizes the crossovers and volume chambers. Pressure in the crossovers helps hold the upper inlet poppets on seat. The valve will then be in the ready-to-run position. On the next attempt to actuate normally, if side B is still unable to actuate synchronously with side A, the same sequence of events described above will occur again.

**WARNING:**

If asynchronous operation occurs while DE-ACTUATING, the pilot supply/timing chambers on one side will still be exhausted as described above. However, this could be a temporary situation because the cause of the asynchronous operation may be able to correct itself allowing the stuck or slow acting side of the valve to eventually move back into the de-actuated position. Once the slow or stuck side has de-actuated, the pilot supply/timing chambers that were exhausted will then repressurize. If an external monitoring system is only checking the status indicator periodically this fault signal could be missed. The machine's safety system must be designed to ensure that this does not cause a hazardous situation.

**Status indicator:**
The status indicator pressure switch will actuate when the main valve is operating normally, and will de-actuate when the main valve operation is sufficiently asynchronous 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.

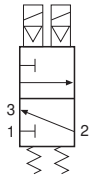

Status indicator in normal ready-to-run position

# DM2® Series E

## Control Reliable Double Valves with Dynamic Monitoring & Memory

ISO 13849-1:2006 Category 4
PL e applications
(approval pending)

- **Dynamic Monitoring with Memory:** Memory, monitoring, and air flow control functions are integrated into two identical valve elements for CAT 4 applications, except control of the clutch/brake mechanism on mechanical power press. Valves lock-out if asynchronous movement of valve elements occurs during actuation or de-actuation, resulting in a residual outlet pressure of less than 1% of supply.
- **An action is required for reset** – cannot be reset by removing and re-applying supply pressure or electrical power. Reset can only be accomplished by the integrated electrical (solenoid) 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:** Includes a pressure switch with both NO and NC contacts to provide status feedback to the control system indicating whether the valve is in the lockout or ready-to-run condition.
- **Silencers:** All models include high flow, clog resistant silencers.
- **Mounting:** Inline mounted with BSPP or NPT pipe threads. Inlet and outlet ports on both sides provide for flexible piping (plugs for unused ports included).



Simplified Schematic

| Port Sizes In-Out | Exh. | Valve Model Number* | Avg. $C_v$ In-Out | Exh. | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|---|
| 1/4 | 1/2 | DM2ENA20**21 | 1.34 | 2.43 | 4.96 (126.1) | 4.87 (123.6) | 11.14 (283) | 5.6 (2.43) |
| 3/8 | 1/2 | DM2ENA21**21 | 1.92 | 2.43 | 4.96 (126.1) | 4.87 (123.6) | 11.14 (283) | 5.6 (2.43) |

* NPT port threads. For BSPP threads , replace "N" in the model number with a "D".
** Insert voltage code: "A" = 24 volts DC; "B" = 110 volts AC, 50/60 Hz; "C" = 220 volts AC, 50/60 Hz; "D" = 12 volts DC.

***This valve is not designed for controlling clutch/brake mechanisms on mechanical power presses, see DM2® series D for mechanical power press applications.***

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

**Pilot Solenoid:** According to VDE 0580. Enclosure rating according to DIN 400 50 IP 65. Connector socket according to DIN 43650 Form A. Three solenoids, rated for continuous duty.

**Power Consumption (each solenoid):** 6.0 watts on DC; 15.8 VA inrush and 10.4 VA holding on AC.

**Reset Solenoid Power Consumption:** 6.0 wats on DC; 15.8 VA inrush and 10.4 VA holding on AC.

**Standard Voltages:** 110 volts AC, 50/60 Hz; 220 volts AC, 50/60 Hz; 12 volts DC; 24 volts DC. For other voltages, consult ROSS.

**Ambient Temperature:** 15° to 122°F (4° to 50°C).

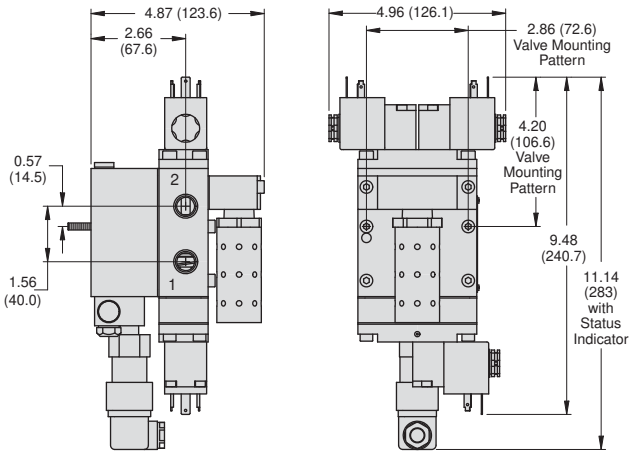
**Media Temperature:** 40° to 175°F (4° to 80°C).

**Flow Media:** Filtered, lubricated or unlubricated air (mineral oils according to DIN 51519, viscosity classes 32-46); 5 micron recommended.

**Inlet Pressure:** 30 to 116 psig (2 to 8 bar).

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

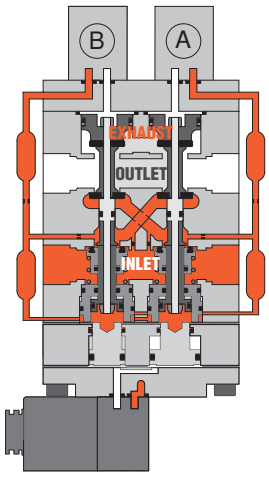
**DIMENSIONS –** inches (mm)



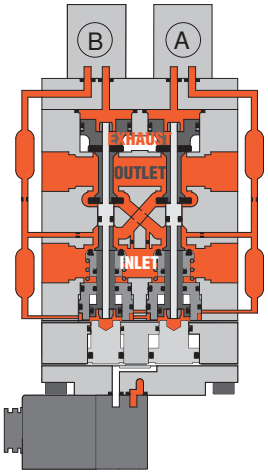

**IMPORTANT NOTE:** Please read carefully and thoroughly all of the **CAUTIONS** on the inside back cover.

# Overview of DM²® Series E Double Valve Function

**Valve de-actuated (ready-to-run):**
The flow of inlet air pressure into the crossover passages from the inlet chamber is restricted by orifices that allow air pressure to bypass the lower inlet poppets. Flow is sufficient to quickly pressurize the pilot supply/timing chambers on both sides A and B. The upper inlet poppets prevent air flow from the crossover passages into the outlet chamber. Air pressure acting on the inlet poppets and return pistons securely hold the valve elements in the de-actuated position. (Air passages shown out of position for clarity.)



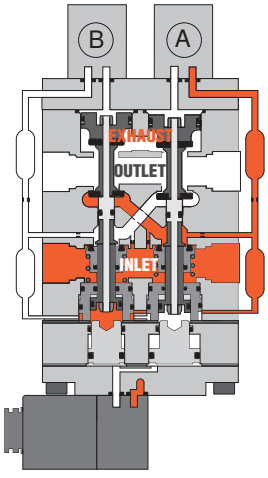
Valve ready-to-run



Valve actuated

**Valve actuated:**
Energizing the pilot solenoids simultaneously applies pressure to both pistons, forcing the internal parts to move to their actuated position, where inlet air flow to outlet is open and both exhaust poppets are closed. The outlet is then quickly pressurized, and pressure in the inlet, crossovers, outlet, and timing chambers are quickly equalized. De-energizing the main solenoids causes the valve elements to return to the ready-to-run (de-actuated) position.

**Valve locked-out:**
Whenever the valve elements operate in a sufficiently asynchronous manner, either on actuation or de-actuation, the valve will shift into a locked-out position. In the locked-out position, one crossover and its related timing chambers will be exhausted, and the other crossover and its related timing chambers will be pressurized. The valve element (side A) that is partially actuated has pilot air available to actuate it, but there is no air pressure on the return piston to de-actuate that valve element.

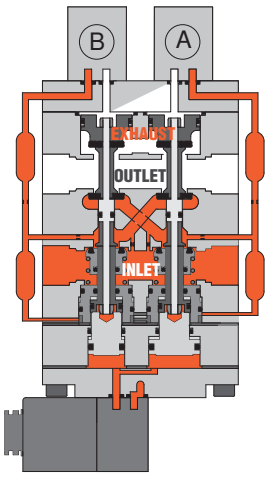


Valve locked-out

Air pressure in the crossover acts on the differential of side A stem diameters creating a latching force.

Side B is in the de-actuated position, but has no pilot air available to actuate with and has full pressure on its upper and lower inlet poppets and return piston to hold it in place. Inlet air flow on side B into its crossover is restricted and flows through the open upper inlet poppet on side A, 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. Also, the return springs can only return the valve elements to the intermediate (locked-out) position. Therefore, the valve will remain in the locked-out position even if the inlet air supply is removed and re-applied. A reset signal must be applied intentionally in order to reset the valve.

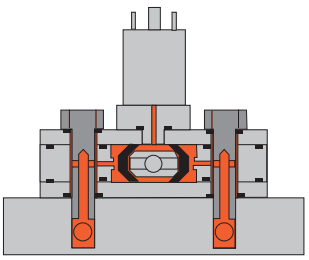
**Resetting the valve:**
Reset is accomplished by momentarily energizing the reset solenoid. Actuation of the reset solenoid provides inlet air pressure to the reset pistons which physically push the main valve elements to their de-actuated position. Inlet air pressurizes the crossovers and volume chambers, thereby applying air to the return pistons which then hold the upper inlet poppets on seat. De-actuation of the reset solenoid removes pressure from the lower side of the reset pistons, thus allowing them to return to their de-actuated position.



Valve being reset

**Reset anti-tie-down feature:**
Attempting to energize the valve's main solenoids while the reset solenoid is energized will cause side B to shift (overcoming the pressure on the small reset piston), but side A will not move due to the pressure on the larger reset piston on that side. This will cause the valve to go into and remain in the locked-out position until a reset signal is applied while the main solenoids are de-energized.

**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 when inlet pressure is removed. This device is not part of the valve lockout function, but, rather, only reports the status of the main valve.


Status indicator in normal ready-to-run position

# DM2® Series C

## Control Reliable Double Valves with Dynamic Monitoring & Memory

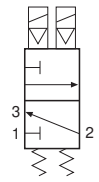
ISO 13849-1:2006
Category 4 PL e
applications

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

- **Dynamic Monitoring With Memory:** Memory, monitoring, and air flow control functions are integrated into two identical valve elements. Valves lock-out if asynchronous movement of valve elements occurs during actuation or de-actuation, resulting in a residual outlet pressure of less than 1% of supply.
- **An action is required for reset** – cannot be reset by removing and re-applying supply pressure. Reset can only be accomplished by the optional integrated electrical (solenoid) 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 NO & NC contacts to provide status feedback to the 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® Series C 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.

**Size 12 and 30**

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



Simplified Schematic

| Valve Size | Port Size In-Out | Valve Model Number* | Avg. $C_v$ | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|
| 4 | 1/2 - 1/2 | DM2CNA42**21 | 3 | 4.34 (110.2) | 12.00 (304.8) | 6.33 (160.8) | 5.9 (2.6) |
| 8 | 3/4 - 3/4 | DM2CNA54**21 | 4.4 | 5.41 (137.4) | 12.58 (319.5) | 7.48 (190.0) | 8.4 (3.7) |
| 8 | 1 - 1 | DM2CNA55**21 | 4.4 | 5.41 (137.4) | 12.58 (319.5) | 7.48 (190.0) | 8.4 (3.7) |
| 12 | 1 - 1 | DM2CNA66**21 | 8.5 | 6.74 (117.2) | 14.39 (365.5) | 9.42 (239.3) | 15.3 (6.7) |
| 30 | 1½ - 2 | DM2CNA88**21 | 22 | 9.85 (250.2) | 16.94 (430.3) | 11.82 (300.3) | 34.7 (15.1) |

* NPT port threads. For BSPP threads replace "N" in the model number with a "D".
** Insert voltage code: "A" = 24 volts DC; "B" = 110 volts AC, 50/60 Hz; "C" = 220 volts AC, 50/60 Hz; "D" = 12 volts DC.

***This valve is not designed for controlling clutch/brake mechanisms on mechanical power presses, see DM2® series D for mechanical power press applications.***

**STANDARD SPECIFICATIONS** (for valves on this page)**:**
**Pilot Solenoid:** According to VDE 0580. Enclosure rating according to DIN 400 50 IP 65. Connector socket according to DIN 43650 Form A. Three solenoids, rated for continuous duty.
**Standard Voltages:** 110 volts, 50/60 Hz; 220** volts, 50/60 Hz; 24 volts DC. For other voltages, consult ROSS.
** 220 volts AC not available in the U.S. (OSHA regulations limit press control voltage to no more than 120 volts AC.
**Power Consumption (each solenoid):**
*Size 4, 12, 30: Primary and reset solenoids:* 6.0 watts on DC; 15.8 VA inrush and 10.4 VA holding on AC.
*Size 8: 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.
**Enclosure Rating:** IP65, IEC 60529.
**Electrical Connection:** DIN 43650. Order connectors separately.
**Ambient Temperature:** 15° to 122°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); 5 micron recommended.
**Inlet Pressure:** 30 to 120 psig (2 to 8 bar).
**Reset Pressure:** For remote reset option – equal to inlet pressure.
**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 with pilot solenoids on top.

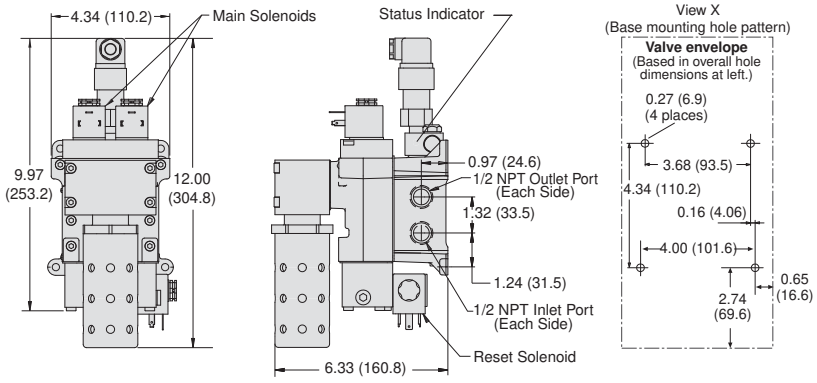
**IMPORTANT NOTE:** Please read carefully and thoroughly all of the **CAUTIONS** on the inside back cover.

# DM²® Series C

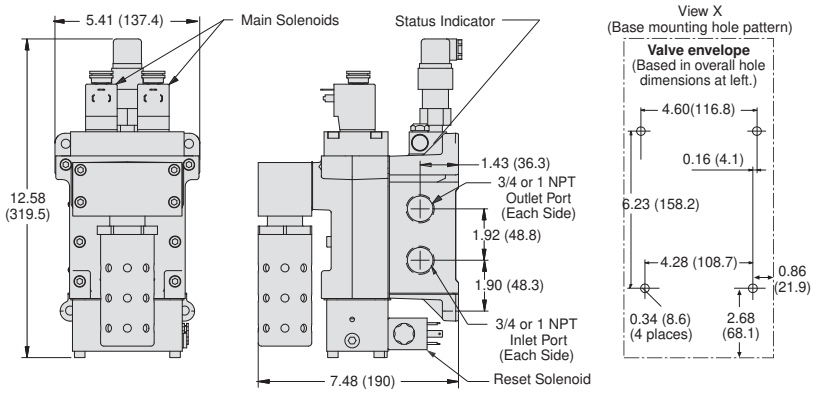
## Control Reliable Double Valves with Dynamic Monitoring & Memory

**DIMENSIONS –** inches (mm)

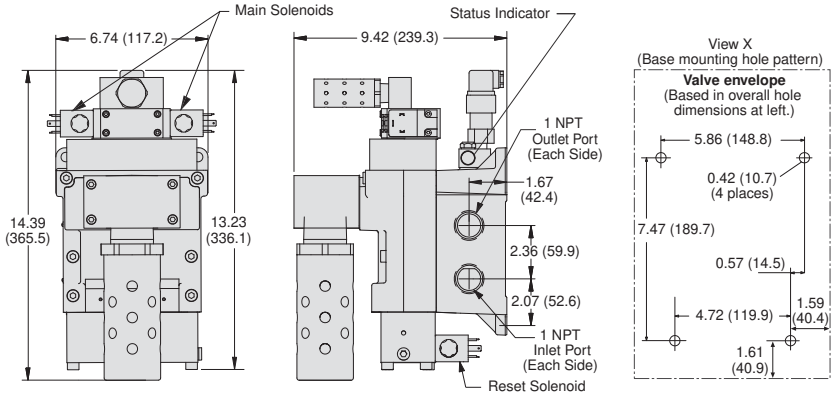
### SIZE 4



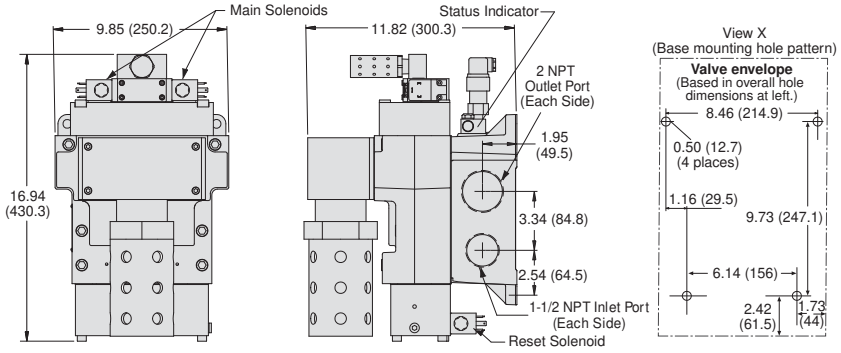

### SIZE 8




### SIZE 12

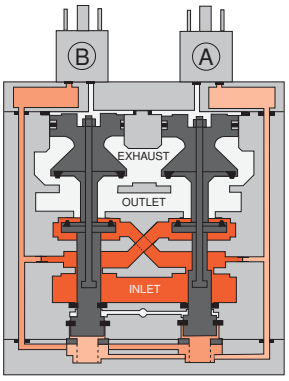



### SIZE 30

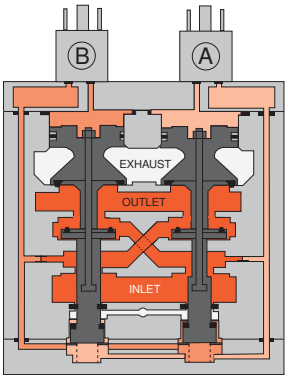


# Overview of DM²® Series C Double Valve Function

**Valve de-actuated:**
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 ready-to-run

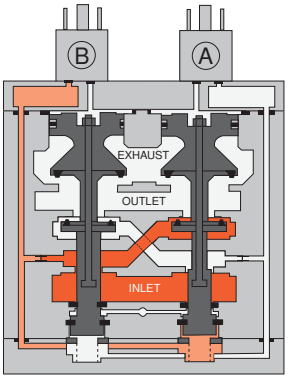


Valve actuated

**Valve actuated:**
Energizing the pilot valves simultaneously applies pressure to both pistons, forcing the internal parts to move to their actuated (open) position, where inlet air flow to crossover passages is fully open, inlet poppets are fully open and exhaust poppets are fully closed. The outlet is then quickly pressurized, and pressure in the inlet, crossovers, outlet, and timing chambers are quickly equalized.

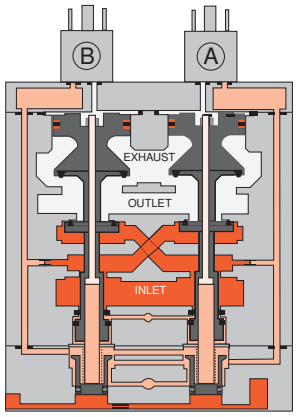
De-energizing the pilots quickly causes the valve elements to return to the ready-to-run position.

**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.

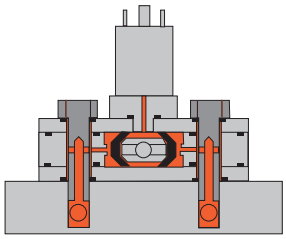


Valve locked-out

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

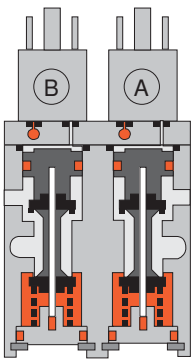


Valve being reset


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

**Status indicator:**
The optional 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.

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.



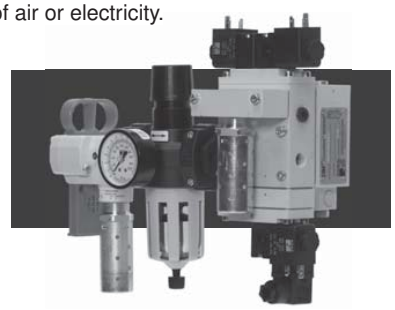
Size 12 & 30 pilots

# Air Entry Packages with Control Reliable Energy Isolation

***These systems are not designed for controlling clutch/brake mechanisms on mechanical power presses.***

## Category 4 with Modular L-O-X® and DM2® Series E

- Pre-engineered panel-mounted design with air entry via a filter and regulator "FR", or filter, regulator and lubricator "FRL".
- Includes DM2® Series E Double Valve with Monitoring & Memory:
  a) Self-contained dynamic monitoring system requires no further valve monitoring controls,
  b) Dynamic memory of abnormal function prevents unintentional reset with removal of air or electricity.
- All necessary features for safety applications are included:
  a) Electrical reset valve,
  b) Status indicator switch for valve condition (ready-to-run) feedback.

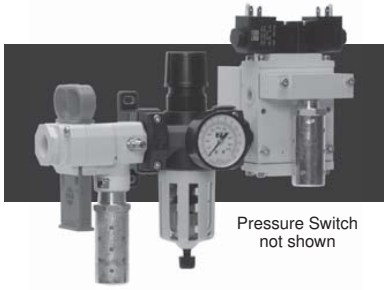


| Model Number* | Air Entry Type | Port Size In-Out | Port Size Exh. | $C_v$ 1 to 2 | $C_v$ 2 to 3 | Dimensions (inches/mm) Length | Width | Depth |
|---|---|---|---|---|---|---|---|---|
| RC404-09 | FR | 1/4 | 1/2 | 1.3 | 2.4 | 13.00 (330.0) | 11.68 (296.7) | 5.40 (134.7) |
| RC406-09 | FR | 3/8 | 1/2 | 1.9 | 2.4 | 13.00 (330.0) | 11.68 (296.7) | 5.40 (134.7) |
| RC404L-09 | FRL | 1/4 | 1/2 | 1.3 | 2.4 | 13.00 (330.0) | 11.68 (296.7) | 5.40 (134.7) |
| RC406L-09 | FRL | 3/8 | 1/2 | 1.9 | 2.4 | 13.00 (330.0) | 11.68 (296.7) | 5.40 (134.7) |

*NPT port threads. Specify voltage and hertz when ordering, M12 connectors available, consult ROSS.

## Category 3 with Modular L-O-X® and DM1 Series E

- Pre-engineered panel-mounted design with air entry via a filter and regulator "FR", or filter, regulator and lubricator "FRL".
- Includes DM1 Series E Double Valve with Monitoring:
  a) Self-contained dynamic monitoring system requires no further valve monitoring controls,
  b) Ready-to-run: If an abnormality clears itself upon the removal of electricity to both solenoids, it will be ready-to-run again. It does not remember the abnormality & stay in a locked-out state until intentionally reset. Therefore, cumulative abnormalities may go undetected,
  c) Status indicator switch for valve condition (ready-to-run) feedback.

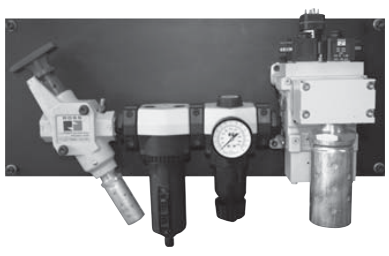



| Model Number* | Air Entry Type | Port Size In-Out | Port Size Exh. | $C_v$ 1 to 2 | $C_v$ 2 to 3 | Dimensions (inches/mm) Length | Width | Depth |
|---|---|---|---|---|---|---|---|---|
| RC304-09 | FR | 1/4 | 1/2 | 1.3 | 2.4 | 13.00 (330.0) | 11.00 (279.0) | 5.40 (134.7) |
| RC306-09 | FR | 3/8 | 1/2 | 1.9 | 2.4 | 13.00 (330.0) | 11.00 (279.0) | 5.40 (134.7) |
| RC304L-09 | FRL | 1/4 | 1/2 | 1.3 | 2.4 | 13.00 (330.0) | 11.00 (279.0) | 5.40 (134.7) |
| RC306L-09 | FRL | 3/8 | 1/2 | 1.9 | 2.4 | 13.00 (330.0) | 11.00 (279.0) | 5.40 (134.7) |

*NPT port threads. Specify voltage and hertz when ordering, M12 connectors available, consult ROSS.

## Category 4 with Manual L-O-X® and DM2® Series C

- Pre-engineered panel-mounted design with air entry via a filter and regulator "FR", or filter, regulator and lubricator "FRL"
- Includes DM2® Series C Double Valve with Monitoring & Memory:
  a) Self-contained dynamic monitoring system requires no further valve monitoring controls,
  b) Dynamic memory of abnormal function prevents unintentional reset with removal of air or electricity
- All necessary features for safety applications are included:
  a) Electrical reset valve,
  b) Status indicator switch for valve condition (ready to run) feedback



| Model Number* | Air Entry Type | Port Size In-Out | Port Size Exhaust | $C_v$ 1 to 2 | Dimensions (inches/mm) Length | Width | Depth |
|---|---|---|---|---|---|---|---|
| RC408-06 | FR | 1/2 | 1 | 3 | 24.0 (610) | 14.5 (369) | 7.4 (187) |
| RC412-06 | FR | 3/4 | 1 | 4.4 | 24.0 (610) | 15.7 (399) | 8.3 (211) |
| RC416-06 | FR | 1 | 1 | 4.4 | 27.0 (686) | 19.0 (483) | 9.0 (229) |
| RC408L-06 | FRL | 1/2 | 1 | 3 | 24.0 (610) | 14.5 (369) | 7.4 (187) |
| RC412L-06 | FRL | 3/4 | 1 | 4.4 | 24.0 (610) | 15.7 (399) | 8.3 (211) |
| RC416L-06 | FRL | 1 | 1 | 4 | 31.0 (788) | 19.0 (483) | 9.0 (229) |

*NPT port threads. Specify voltage and hertz when ordering, M12 connectors available, consult ROSS.

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

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# DM²® Series D Double Valves

The ROSS DM²® Series D double valves provide significant features in response to the changing demands of the mechanical press industry and its associated standards and regulations regarding the control of pneumatically controlled clutch and brake applications. The consensus requirements of the regulations and good practices require that, in case of a failure within the valve, the clutch and brake mechanisms be quickly exhausted, a monitor takes action to prevent further operation, and a method to alert personnel is incorporated. These features also make the valve suitable for use in other Category 3 & 4 safety-related applications.

A ROSS DM²® Series D double valve has two valve elements independently controlled by two solenoid pilots. The two valve elements share common inlet, outlet, and exhaust ports. When the pilot valves are simultaneously energized, the valve elements operate so that the valve functions as a 3/2 normally closed valve.

If one of the valve elements does not open or close synchronously with the other, the valve goes into a faulted condition, exhausts downstream air and keeps residual outlet pressure to less than 1% of inlet supply. This is an important safety characteristic of the ROSS DM²® Series D design.

Valve element redundancy provides an additional safety factor, as the likelihood of a malfunction in both valve elements in the same cycle is considered extremely remote.

DM²® valves also have an internal monitor that is integrated into the valve elements. Should the valve operate abnormally, the monitor will lock-out the valve and prevent further operation until corrective action is taken.

***IMPORTANT NOTE:***

Standards, regulations, and good practice all require that mechanical power presses or other hazardous machines using a pneumatically-controlled clutch and brake mechanism be equipped with a double valve with a self-contained monitoring device and/or an external monitoring system, which inhibits further operation of the valve and machine in the event of a failure within the valve. Of course, a double valve is just one of the components in a press control system, and all other elements of the system should be planned with safety as a primary consideration.

## DM²® Monitoring:

The DM²® is a patented 3/2 normally closed valve (with an intermediate, lockout position) distinguished by 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.

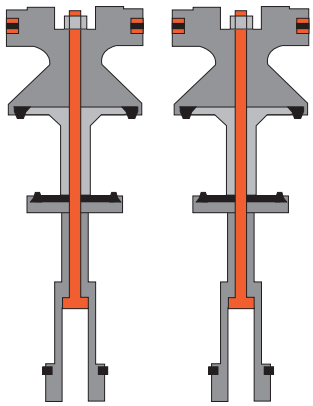
*Dynamic Memory* within a monitoring system indicates that when a valve lock-out occurs, the valve will retain the fault information regardless of air or electrical changes. The DM²® system can only be reset by a defined operation/procedure, and will not self-reset (turning the valve off and on) or reset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

## The Leader in Double Valve Design

ROSS has long been in the forefront of double valve research and development.

For over 60 years ROSS has been responding to the needs of press manufacturers and users by progressively improving double valve technology. Internal flow patterns of double valves developed by ROSS have included series flow, parallel flow, combined series-parallel tandem flow, and combined series-parallel Crossflow™.

Monitoring devices have also been offered in a variety of designs to satisfy differing requirements. Traditionally, in order to achieve complete monitoring capability, it has been necessary to add devices or components to the valve or to the control system.



The DM²® Series D valve combines the monitor and the main valve components into two identical piston-poppet assemblies. Two piston-poppet assemblies provide a redundant 3/2 normally closed air flow pattern and the patented internal design provides dynamic monitoring as well as complete memory.

During valve operation air pressure acting on changing combinations of assembly surfaces cause the assemblies to move to the required position. Force balances in the valve assure positive shifting forces during normal operation as well as a positive force to hold the assemblies in a locked-out position.

# DM²® Series D

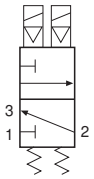
# Double Valves with Total Dynamic Monitoring & Complete Memory

## Self Monitored - Clutch/Brake Control


Size 8


Size 4


Size 2



Simplified Schematic

For Size 2 Certifications Approval Pending


Size 12


Size 30

**Valve Sizes:** DM²® Series D double valves are available in 5 sizes, providing a broad range of flow capabilities to meet your needs. For convenience, valves are designated by the nominal sizes 2, 4, 8, 12, and 30 with outlet ports ranging from 1/4" to 2".

**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.

**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.

**STANDARD SPECIFICATIONS:** For DM²® Series D double valves.
**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:** 110 volts, 50/60 Hz; 220** volts, 50/60 Hz; 24 volts DC. For other voltages, consult ROSS.
** 220 volts AC not available in the U.S. (OSHA regulations limit press control voltage to no more than 120 volts AC. Specify voltage and frequency on order.
**Power Consumption (each solenoid):**
***Size 2, 4, 12, 30:***
*For primary and reset solenoids:*
6.0 watts on DC; 15.8 VA inrush and 10.4 VA holding on AC.
***Size 8:*** *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:**
*Size 2, 4, 8, 12, 30:* DIN 43650, Form A. Order connectors separately.
**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); 5-micron recommended.
**Inlet Pressure:** *Size 2:* 45 to 150 psig (3.1 to 10.3 bar).
*Size 4, 8, 12, 30:* 30 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 (with pilot solenoids on top).

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

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# DM2® Series D Double Valves

## HOW TO ORDER

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

**DM2D D A 4 2 A 1 1**

**PRODUCT**

**THREAD**
BSPP ..... D
NPT ..... N
N/A (no base) ..... X

**REVISION LEVEL**

**BASIC SIZE**
2 ..... 2
4 ..... 4
8 ..... 5
12 ..... 6
30 ..... 8

**BASE PORT SIZE**
**Size 2** 1/4 inlet – 1/4 outlet ..... 0
3/8 inlet – 3/8 outlet ..... 1
**Size 4** 1/2 inlet – 1/2 outlet ..... 2
1/2 inlet – 3/4 outlet ..... 3
**Size 8** 3/4 inlet – 3/4 outlet ..... 4
1 inlet – 1 outlet ..... 5
**Size 12** 1inlet – 1outlet ..... 6
1inlet – 1½ outlet ..... 7
**Size 30** 1½ inlet – 2 outlet ..... 8
**Valve only (less base)** ..... X

**STATUS INDICATOR**
1 ..... YES
X ..... NO

**RESET TYPE**
1 ..... REMOTE
2 ..... SOLENOID
4 ..... MANUAL

**VOLTAGE**
A ..... 24 volts DC
B ..... 110 volts AC, 50/60 Hz
C** ..... 220 volts AC, 50/60 Hz
** 220 VAC not available in the U.S. (OSHA regulations limit press control voltage to no more than 120 volts AC).

**BASE MODEL NUMBERS and BASE SPECIFIC INFORMATION**

| Valve Size | Port Size Inlet | Port Size Outlet | Base Model Number* | Status Indicator | Weight lb (kg) |
|---|---|---|---|---|---|
| 2 | 1/4 | 1/4 | 1872C91 | No | 1.7 (0.8) |
| 2 | 1/4 | 1/4 | 1873C91 | Yes | 2.1 (1.0) |
| 2 | 3/8 | 3/8 | 1874C91 | No | 1.7 (0.8) |
| 2 | 3/8 | 3/8 | 1875C91 | Yes | 2.1 (1.0) |
| 4 | 1/2 | 1/2 | 1697C91 | No | 1.7 (0.8) |
| 4 | 1/2 | 1/2 | 1698C91 | Yes | 2.3 (1.1) |
| 4 | 1/2 | 3/4 | 1699C91 | No | 1.7 (0.8) |
| 4 | 1/2 | 3/4 | 1700C91 | Yes | 2.3 (1.1) |
| 8 | 3/4 | 3/4 | 1701C91 | No | 3.6 (1.6) |
| 8 | 3/4 | 3/4 | 1702C91 | Yes | 4.2 (1.9) |
| 8 | 1 | 1 | 1703C91 | No | 3.6 (1.6) |
| 8 | 1 | 1 | 1704C91 | Yes | 4.2 (1.9) |
| 12 | 1 | 1 | 1705C91 | No | 6.2 (2.8) |
| 12 | 1 | 1 | 1706C91 | Yes | 6.8 (3.1) |
| 12 | 1 | 1½ | 1707C91 | No | 6.2 (2.8) |
| 12 | 1 | 1½ | 1708C91 | Yes | 6.8 (3.1) |
| 30 | 1½ | 2 | 1709C91 | No | 12.0 (5.4) |
| 30 | 1½ | 2 | 1710C91 | Yes | 12.6 (5.7) |

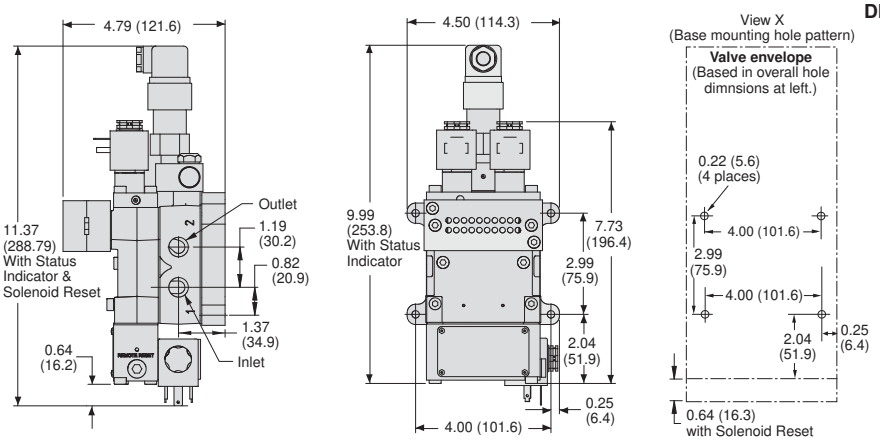
*NPT port threads. For BSPP threads add a "D" prefix to the model number, e.g., D1872C91.

**Valve Weight:** Valve and base assembly with status indicator and solenoid reset.

*Size 2:* 5.0 lb (2.3 kg).
*Size 4:* 6.0 lb (2.8 kg).
*Size 8:* 9.1 lb (4.2 kg).
*Size 12:* 15.5 lb (7.1 kg).
*Size 30:* 32.6 lb (14.8 kg).

## SIZE 2

**DIMENSIONS** – inches (mm)



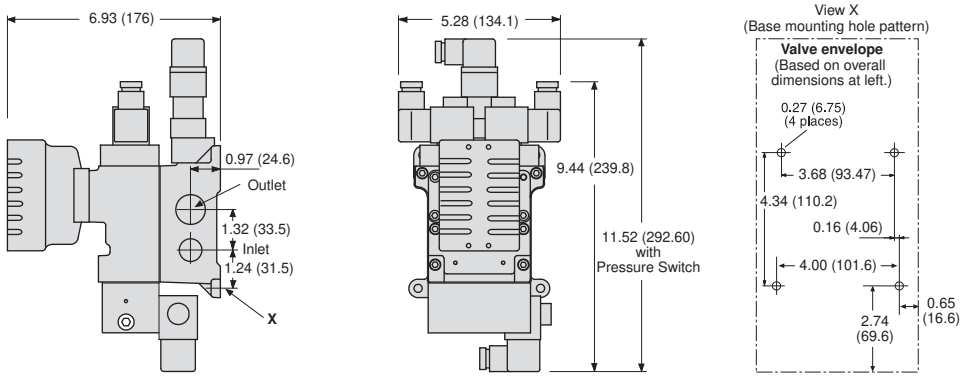

$C_v$ :
1 to 2: 2.17
2 to 3: 3.66

# DM²® Series D Double Valves

**DIMENSIONS** – inches (mm)

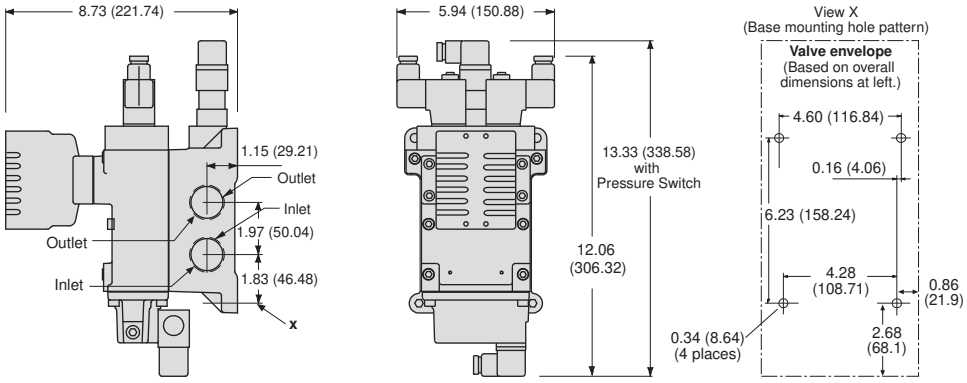
## SIZE 4

$C_V$:
1 to 2: 2.80
2 to 3: 6.70



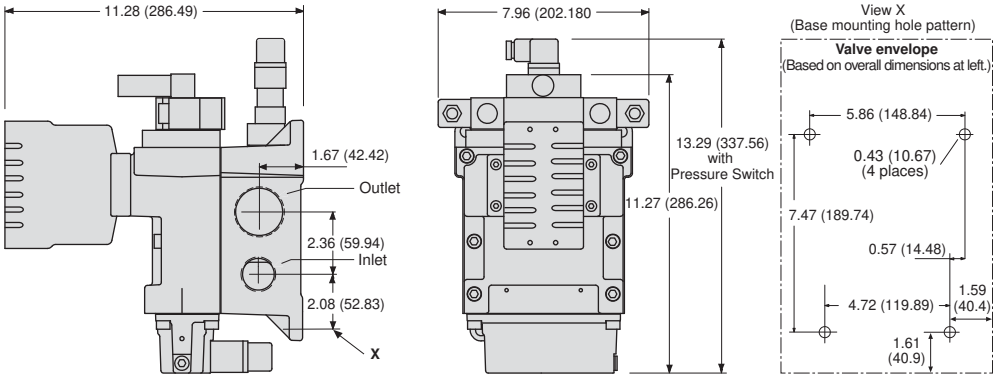

## SIZE 8

$C_V$:
1 to 2: 4.63
2 to 3: 12.55



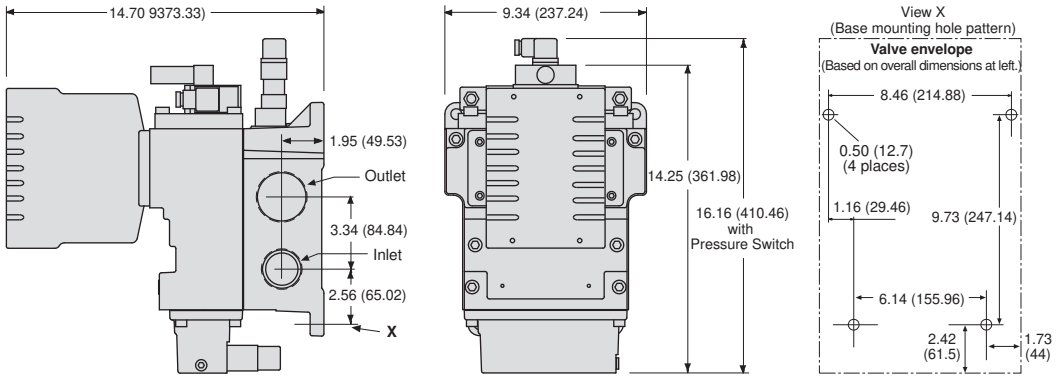

## SIZE 12

$C_V$:
1 to 2: 8.86
2 to 3: 20.78



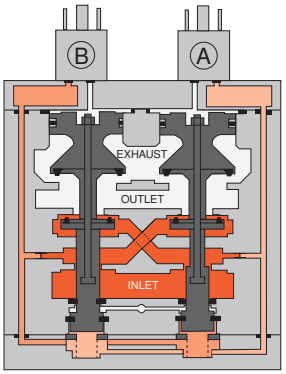

## SIZE 30

$C_V$:
1 to 2: 20.22
2 to 3: 53.68

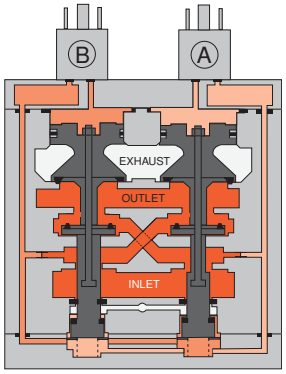


# Overview of DM²® Series D Double Valve Function

**Valve de-actuated:**
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 ready-to-run

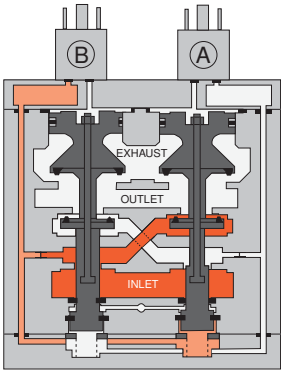


Valve actuated

**Valve actuated:**
Energizing the pilot valves simultaneously applies pressure to both pistons, forcing the internal parts to move to their actuated (open) position, where inlet air flow to crossover passages is fully open, inlet poppets are fully open and exhaust poppets are fully closed. The outlet is then quickly pressurized, and pressure in the inlet, crossovers, outlet, and timing chambers are quickly equalized.

De-energizing the pilots quickly causes the valve elements to return to the ready-to-run position.

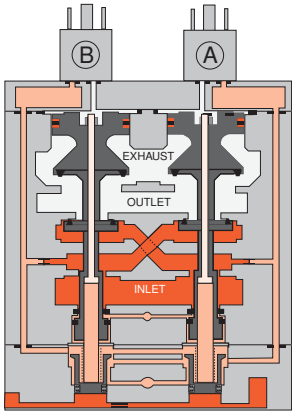
**Valve locked-out:**
Whenever the valve elements operate in a sufficiently asynchronous manner, either on actuation or de-actuation, the valve will move to a locked-out position. In the locked-out position, one crossover and its related timing chamber will be exhausted, and the other crossover and its 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.



Valve locked-out

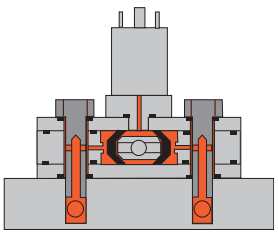
Side A is in a fully closed position, and has no pilot air available to actuate, but has full pressure on the inlet poppet and return piston to hold the element in the fully closed position.
Inlet air flow on side A into its crossover is restricted, and flows through the open inlet poppet on side B, 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.)



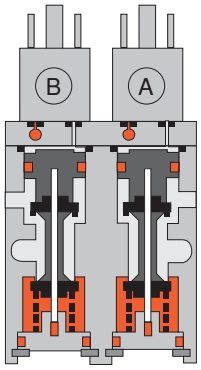
Valve being reset

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 (optional) in normal ready-to-run position

**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.

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 electrical current required to operate the pilots, to a minimum.



Size 12 & 30 pilots

# Preassembled Wiring Kits for DM[1] and DM[2®] Series Double Valve

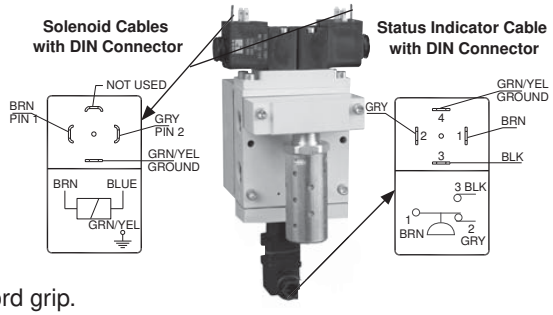
## DM[1] Series Wiring Kits

These kits include 2 cables with either a DIN or M12 connector plus a cord grip for each. They are available in lengths of 5 or 10 meters. Separate kits are available for the Status Indicator. (Note: Each cable has one connector.)

| Kit Number | Solenoid Connector Type | Length (meters) |
|---|---|---|
| 2243H77 | DIN | 5 |
| 2244H77 | DIN | 10 |
| 2245H77 | M12 | 5 |
| 2246H77 | M12 | 10 |

| Status Indicator Kit Number | Length (meters) |
|---|---|
| 2247H77 | 5 |
| 2248H77 | 10 |

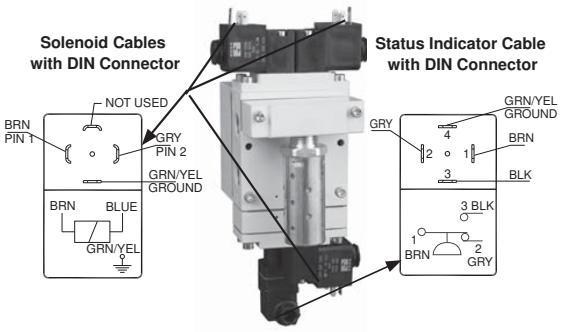
**Status Indicator kits** include one cable with DIN connector and a cord grip.




## DM[2®] Series Wiring Kits Standard Wiring Kits

Kits include three cables for the solenoids and one cable for the status indicator. All cables come with a cord grip. Solenoid cables come with either DIN or M12 connectors. They are available in lengths of 5 or 10 meters.
(Note: Each cable has one connector.)

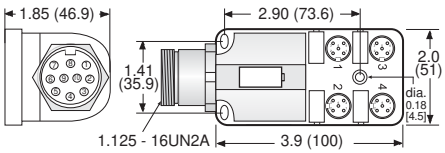
| Kit Number | Solenoid Connector Type | Length (meters) |
|---|---|---|
| 2283H77 | DIN | 5 |
| 2284H77 | DIN | 10 |
| 2288H77 | M12 | 5 |
| 2289H77 | M12 | 10 |



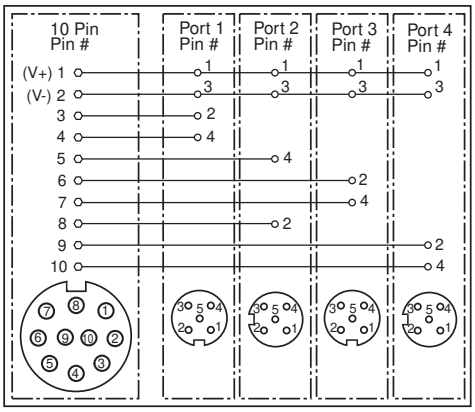

## Wiring Kits with J-Box

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 DM[2®] 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).

| Kit Number | Solenoid Connector Type | Length (meters) |
|---|---|---|
| 2249H77 | M12 - DIN | 1 |
| 2250H77 | M12 - DIN | 1 |




### J-Box Wiring




## 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 gage wire.

| Kit Number | Length (feet) |
|---|---|
| 2253H77 | 12 |
| 2254H77 | 20 |

| Kit Number | Length (feet) |
|---|---|
| 2255H77 | 30 |
| 2256H77 | 50 |

| PIN # | | PIN # | |
|---|---|---|---|
| 1 | +24 volts DC | 6 | - |
| 2 | Common volts DC | 7 | - |
| 3 | Solenoid B | 8 | - |
| 4 | Solenoid A | 9 | Remote Valve Fault Light |
| 5 | Remote Reset | 10 | Remote System OK Light |

| Wire Colors: | Wire Colors: |
|---|---|
| Orange | Orange w/Black |
| Blue | Red |
| White w/Black | Green/Yellow |
| Red w/Black | Black |
| Green w/Black | White |

## Outlet Port Pressure Monitoring Kit

Some customers prefer to monitor downstream pressure in addition to using the or DM[1] 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). A pressure switch is available separately - order part number 586A86.

**Kit Number** 2251H77

# Additional ROSS Double Valves

ROSS double valves, also known as “Control-Reliable” or “Press Safety” valves, are pneumatic control valves with two internal elements (redundant), both of which must operate correctly in order to supply pressure to the outlet port. The general function of these valves is that of a 3/2 normally closed valve (except for the Series 77 - 5/2 CrossMirror®). The main difference between ROSS double valves and standard pneumatic valves is that any circumstance which might cause one of the double valve elements to operate improperly will result in no output to the work device. This means that solenoid failures, loose electrical connections, broken wires, contamination inside the valve body, broken internals or even faulty valve signals will result in an exhausting or “fail-to-safe” condition.

ROSS double valves come in many shapes and sizes to fit any safety application.

Size 1 and 2 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, to check for proper operation of each valve element on every cycle.

Series 35 Serpar® valves are internally monitored double valves and are available in Size 4, 8, 12 and 30 ranging from 3/8” – 1 ½” 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.

**Control reliability does not end at the wire.**
The final element of control in pneumatic safety systems must be a control-reliable valve; otherwise the integrity of the entire system is limited.

All Category 4 electrical devices implemented into safety systems are reduced to Category -1 if they control a standard pneumatic valve in a critical machine operation. Failure of the standard pneumatic valve, for example, to become de-energized when a light curtain is broken could easily result in a hazardous condition. Consider the ROSS line of double valve and see what we can do to improve the integrity of your safety equipment.

**Series 35 Serpar®**
**3/2 double valve**
**Size 4 with L-G monitoring -**
**port sizes 3/8” - 3/4”**

**Series 35 - Crossflow™**
**3/2 double valve**
**with pressure switches**
**for external monitoring**
**Sizes 1 and 2 - port sizes 1/4” - 3/4”**

**Series 35 - SERPAR®**
**3/2 double valve with internal monitoring**
**available with L-G, E-P, or D-S monitoring options**
**Sizes 8, 12 and 30 - port sizes 1/2” - 1½”**

**Series 77 CrossMirror®**
**5/2 double valve for**
**cylinder applications**
**Sizes 2 and 4 - port sizes 1/2” - 3/4”**

**Double Valves with Pressure Switches for External Monitoring feature:**

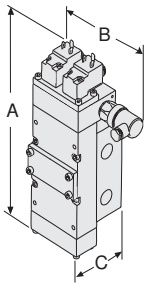
- Designed to enable users to comply with current safety regulations
- Can be integrated with external monitoring systems to provide for lockout and inhibiting further machine operation until the controls system is reset
- Default to de-energized position upon fault condition
- Built-in non-clogging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

**Double Valves with Internal Monitoring & Lockout feature:**

- 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

# 5/2 CrossMirror® Solenoid Pilot Controlled Double Valves Series 77

5/2 CrossMirror® double valve with pressure switch




ISO 13849-1:2006
Category 4 PL e
applications

Size 2 & 4 Certifications

## Valve Size 2

| Model* Number | Port Sizes 1 | 2, 3, 4, 5 | $C_v$ 1-2 | 1-4 | 2-3 | 4-5 | Pressure Switch | Dimensions inches (mm) A | B | C | Weight lb (kg) | Replacements* Valve No. | Base No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7776A3410 | 1/2 | 3/8 | 2.0 | 1.6 | 1.6 | 2.8 | Without | 11.1 (282) | 4.1 (104) | 3.2 (81) | 7.6 (3.4) | 7776A3400 | 996C91 |
| 7776A3411 | 1/2 | 3/8 | 2.0 | 1.6 | 1.6 | 2.8 | With | 11.1 (282) | 6.7 (170) | 3.2 (81) | 8.4 (3.8) | 7776A3401 | 996C91 |

* Model number includes base supplied with NPT threads. For BSPP threads, order model or base with a "D" prefix, e.g., D7776A3410, D996C91.
• For pressure switch option, order model or valve with a "Z" suffix for 110 volts AC or "W" suffix for 24 volts DC, e.g., 7786A3411Z, 7776A3401Z.

## Valve Size 4

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7776A4420 | 3/4 | 1/2 | 3.2 | 3.4 | 2.7 | 7.2 | Without | 12.1 (307) | 4.3 (109) | 4.1 (104) | 10.2 (4.6) | 7776A4400 | 1049C91 |
| 7776A4421 | 3/4 | 1/2 | 3.2 | 3.4 | 2.7 | 7.2 | With | 12.1 (307) | 6.9 (175) | 4.1 (104) | 11.2 (5.1) | 7776A4401 | 1049C91 |
| 7776A5410 | 3/4 | 3/4 | 3.2 | 3.4 | 2.7 | 7.2 | Without | 12.1 (307) | 4.3 (109) | 4.1 (104) | 10.2 (4.6) | 7776A4400 | 1153C91 |
| 7776A5411 | 3/4 | 3/4 | 3.2 | 3.4 | 2.7 | 7.2 | With | 12.1 (307) | 6.9 (175) | 4.1 (104) | 11.2 (5.1) | 7776A4401 | 1153C91 |

* Model number includes base supplied with NPT threads. For G threads, order model or base with a "D" prefix, e.g., D7776A4420, D1049C91.
• For pressure switch option, order model or valve with a "Z" suffix for 110 volts AC or "W" suffix for 24 volts DC, e.g., 7776A4421W, 7776A4401W.

## Valve Size 4 SAE

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S7776A4H10 | SAE 12 | SAE 12 | 3.2 | 3.4 | 2.7 | 7.2 | Without | 12.1 (307) | 4.3 (109) | 4.1 (104) | 10.2 (4.6) | 7776A4400 | 1159G91 |
| S7776A4H11 | SAE 12 | SAE 12 | 3.2 | 3.4 | 2.7 | 7.2 | With | 12.1 (307) | 6.9 (175) | 4.1 (104) | 11.2 (5.1) | 7776A4401 | 1159G91 |

* Model number includes base.
• For pressure switch option, order model or valve with a "Z" suffix for 110 volts AC or "W" suffix for 24 volts DC, e.g., S7776A4H11Z, 7776A4401Z.

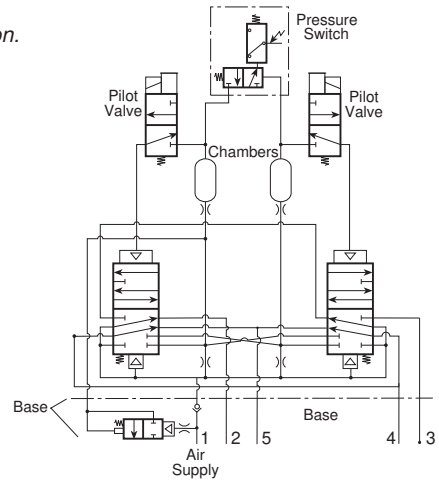
***Pressure Switches:*** *Pressure switch provides a signal when valve is in a faulted position.*

**The NEW ROSS 5/2 CrossMirror® double valve features:**

- Covered by multiple global patents and patents pending
- Interrelated dual stainless steel precision spool & sleeve construction
- Four-way, five port, two position design
- Base-mounted design
- Designed to enable users to comply with current safety regulations
- Optional pressure switch to provide signal for external monitoring

**APPLICATIONS:**

- Amusement park rides
- Pinch point applications
- Die clamp applications
- Long cylinder stroke applications
- Shearing equipment



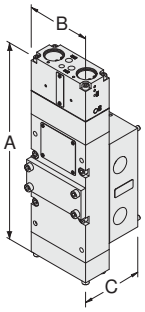

***This valve is not designed for controlling clutch/brake mechanisms on mechanical power presses.***

**STANDARD SPECIFICATIONS** (for valves on this page)**:**
**Pilot Solenoids:** Rated for continuous duty.
**Standard Voltages:** 100-110 volts, 50 Hz; 100-120 volts, 60 Hz; 24 volts DC; 110 volts DC. For other voltages, consult ROSS.
**Power Consumption:** Each solenoid, 18 VA inrush, 14 VA holding on 50 or 60 Hz; 6 watts on DC.

**Electrical Connections:** Uses cord-grip connectors at solenoids. Order connectors separately (see page 108).
**Ambient Temperature:** 40° to 120°F (4° to 50°C).
**Flow Media:** Filtered air; 5 micron recommended.
**Inlet Pressure:** 40 to 150 psig (2.5 to 10 bar).
**Media Temperature:** 40° to 175°F (4° to 80°C).

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

# 5/2 CrossMirror® Pressure Controlled Double Valves Series 77




ISO 13849-1:2006
Category 4 PL e
applications

**Size 2 & 4 Certifications**

This Series 77 5/2 CrossMirror® valve is a control reliable, pressure controlled 4-way double valve that is controlled by two separate pneumatic signals essentially providing "AND" gate control for the output ports. Both pilot signals must be provided within approximately 500 milliseconds of each other to actuate the valve. Proper actuation shifts output pressure to port 4. If the valve is not actuated, not provided appropriate pneumatic signals within the discordance window or if the valve actuates abnormally, inlet pressure will only be passed to port 2 - cylinder retracted.

This valve is constructed with precision, stainless steel spools as the main valve elements, and is designed to offer added safety to the operation of many pneumatically controlled machines.

## Valve Size 2

| Model* Number | Port Sizes 1 | Port Sizes 2, 3, 4, 5 | $C_v$ 1-2 | $C_v$ 1-4 | $C_v$ 2-3 | $C_v$ 4-5 | Pressure Switch | Dimensions inches (mm) A | B | C | Weight lb (kg) | Replacements* Valve No. | Base No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7786A3410 | 1/2 | 3/8 | 2.0 | 1.6 | 1.6 | 2.8 | Without | 10.9 (277) | 4.1 (104) | 3.2 (81) | 7.6 (3.4) | 7786A3400 | 996C91 |
| 7786A3411 | 1/2 | 3/8 | 2.0 | 1.6 | 1.6 | 2.8 | With | 10.9 (277) | 6.7 (170) | 3.2 (81) | 8.4 (3.8) | 7786A3401 | 996C91 |

* Model number includes base supplied with NPT threads. For G threads, order model or base with a "D" prefix, e.g., D7786A3410, D996C91
• For pressure switch option, order model or valve with a "Z" suffix for 110 volts AC or "W" suffix for 24 volts DC, e.g., 7786A3411Z, 7786A3401Z .

## Valve Size 4

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7786A4420 | 3/4 | 1/2 | 3.2 | 3.4 | 2.7 | 7.2 | Without | 12.1 (307) | 4.3 (109) | 4.1 (104) | 10.6 (4.6) | 7786A4400 | 1049C91 |
| 7786A4421 | 3/4 | 1/2 | 3.2 | 3.4 | 2.7 | 7.2 | With | 12.1 (307) | 6.9 (175) | 4.1 (104) | 11.6 (5.1) | 7786A4401 | 1049C91 |
| 7786A5410 | 3/4 | 3/4 | 3.2 | 3.4 | 2.7 | 7.2 | Without | 12.1 (307) | 4.3 (109) | 4.1 (104) | 10.6 (4.6) | 7786A4400 | 1153C91 |
| 7786A5411 | 3/4 | 3/4 | 3.2 | 3.4 | 2.7 | 7.2 | With | 12.1 (307) | 6.9 (175) | 4.1 (104) | 11.6 (5.1) | 7786A4401 | 1153C91 |

* Model number includes base supplied with NPT threads. For G threads, order model or base with a "D" prefix, e.g., D7786A4420, D1049C91.
• For pressure switch option, order model or valve with a "Z" suffix for 110 volts AC or "W" suffix for 24 volts DC, e.g., 7786A4421W, 7786A4401W.

## Valve Size 4 SAE

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S7786A4H10 | SAE 12 | SAE 12 | 3.2 | 3.4 | 2.7 | 7.2 | Without | 12.1 (307) | 4.3 (109) | 4.1 (104) | 10.6 (4.6) | 7786A4400 | 1159G91 |
| S7786A4H11 | SAE 12 | SAE 12 | 3.2 | 3.4 | 2.7 | 7.2 | With | 12.1 (307) | 6.9 (175) | 4.1 (104) | 11.6 (5.1) | 7786A4401 | 1159G91 |

* Model number includes base.
• For pressure switch option, order model or valve with a "Z" suffix for 110 volts AC or "W" suffix for 24 volts DC, e.g., S7786A4H11Z, 7786A4401Z.

**FEATURES:**

- Interrelated dual stainless steel precision spool & sleeve construction
- Four-way, five port, two position design
- Base-mounted design
- Designed to enable users to comply with current safety regulations
- Optional pressure switch to provide signal for external monitoring

***This valve is not designed for controlling clutch/brake mechanisms on mechanical power presses.***

**STANDARD SPECIFICATIONS** (for valves on this page)**:**
**Ambient Temperature:** 40° to 120°F (4° to 50°C).
**Media Temperature:** 40° to 175°F (4° to 80°C).
**Flow Media:** Filtered air; 5 micron recommended.
**Inlet Pressure:** 40 to 100 psig (2.5 to 7 bar).
**Pilot Pressure:** Must be equal or greater than inlet pressure, but should not exceed maximum inlet pressure.

**Pressure Switch Rating:**
*Max Current 4A, Max 250 volts AC.*
*Max Current 50 mA, Max 24 volts DC.*
***Pressure Switch:*** *Pressure Switch signal indicates when the input signals or parts movement is asynchronous.*

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

# 5/2 CrossMirror® Pressure Controlled Double Valves Series 77

## VALVE OPERATION

### Normal Operation:

After installation the valve is operated by pressurizing both pilot supply ports (S1 and S2) simultaneously. This causes both main valve elements to be actuated so that air from inlet port 1 flows to outlet port 4. Air downstream of port 2 is exhausted through port 3.

When the pilot supply ports are de-pressurized, both valve elements are de-actuated, and air then flows from inlet port 1 to outlet port 2. Air downstream of port 4 is exhausted through port 5.

### Safety Function:

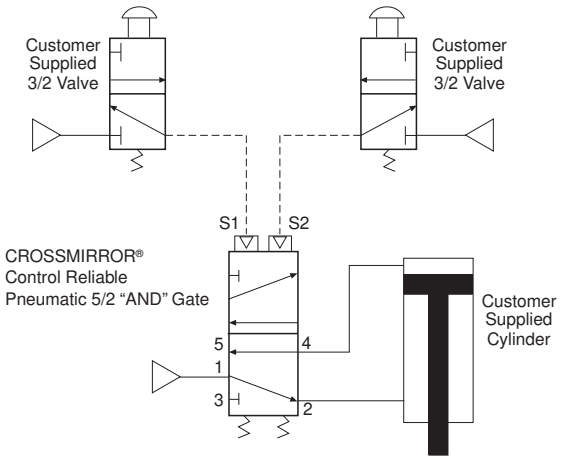
If the two main valve elements are not actuated or de-actuated synchronously, within 500ms, the valve defaults so that outlet port 2 receives full inlet pressure, and outlet port 4 is exhausted through port 5. If this abnormal operation is the result of a temporary circumstance, the valve will be ready to resume normal operation as soon as both pilot signal ports have been de-pressurized and both main valve elements have returned to their normal ready-to-run position. Applying pressure to both signal ports simultaneously will resume normal operation.

If the cause of the abnormal operation is still present, the valve will either remain in the default position (pressure on port 2 and not port 4) or will again go into this position on the next actuation attempt. The source of the abnormality must be investigated and corrected before further operation.

### Pressure Switch:

Valves with model numbers ending in the number 1 have a pressure switch to provide user feedback when movement of the main valve elements was asynchronous.

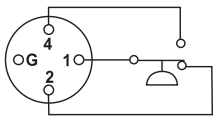
### Typical 2-Hand-Anti-Tie-Down Application




### Status Indicator (pressure switch)

Terminals 1 and 4 are connected when air pressure is present and the valve is "Ready-to-Run". If an abnormal operation has occured or pressure is removed from the valve inlet, terminals 1 and 2 are connected.

**Note:** DC voltage pressure switches do not have a ground terminal.




Pin 1: Common
Pin 2: Normally Closed
Pin G: Not used
Pin 4 : Normally Open

### Pneumatic cylinder applications.

- Two hand control EN574 Type III C
- Forming applications
- Pinch point applications
- Cutting applications
- Shearing equipment
- Clamping applications

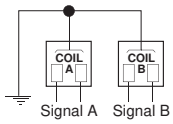
## Service Kits

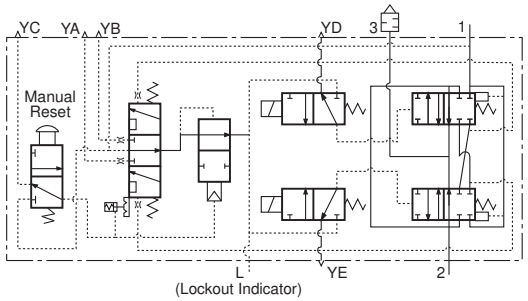
| Valve Size | Valve Model Number | Valve Body Seal and Gasket Kit | Valve Body Service Kit | Base Service Kit | Pressure Switch Assembly Service Kit | Pressure Switch | Pressure Switch Connector |
|---|---|---|---|---|---|---|---|
| 2 | 7786A3400 | 2216K77 | 2218K77 | 1694K77 | N/A | N/A | N/A |
| | 7786A3401 | 2216K77 | 2218K77 | 1694K77 | 1696K77 | AC - 518E30<br>DC - 798E30 | 522E30 |
| 4 | 7786A4400 | 2217K77 | 2219K77 | 1695K77 | N/A | N/A | N/A |
| | 7786A4401 | 2217K77 | 2219K77 | 1695K77 | 1696K77 | AC - 518E30<br>DC - 798E30 | 522E30 |

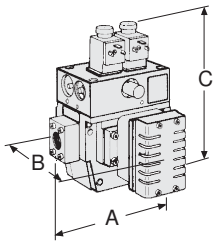
**IMPORTANT NOTE:** Please read carefully and thoroughly all of the **CAUTIONS** on the inside back cover.

# SERPAR® Double Valves with L-G Monitor Series 35

## Size 4

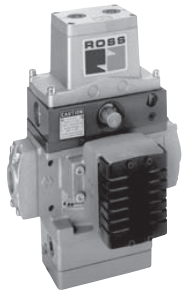


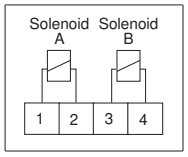



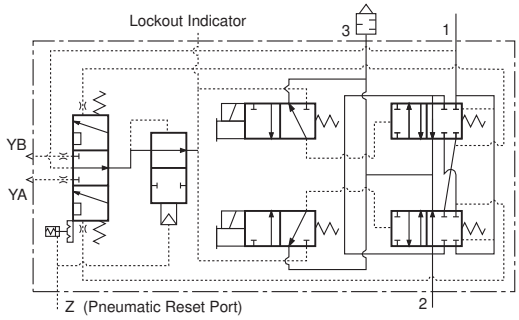



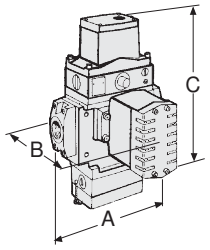

| Valve Size | Port Size | Monitor Reset | Valve Model Numbers Right Inlet | Left Inlet | Average $C_v$* In-Out | Out-Exh. | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|---|---|---|
| 4 | 3/8 | Manual | 3573D3191 | 3573D3195 | 3.0 | 6.0 | 7.4 (188) | 6.3 (160) | 7.4 (188) | 8.3 (3.7) |
| 4 | 3/8 | Remote | 3573D3192 | 3573D3196 | 3.0 | 6.0 | 7.4 (188) | 6.3 (160) | 7.4 (188) | 8.3 (3.7) |
| 4 | 1/2 | Manual | 3573D4211 | 3573D4215 | 3.0 | 8.0 | 7.4 (188) | 6.3 (160) | 7.4 (188) | 8.3 (3.7) |
| 4 | 1/2 | Remote | 3573D4212 | 3573D4216 | 3.0 | 8.0 | 7.4 (188) | 6.3 (160) | 7.4 (188) | 8.3 (3.7) |
| 4 | 3/4 | Manual | 3573D5211 | 3573D5215 | 3.0 | 9.0 | 7.4 (188) | 6.3 (160) | 7.4 (188) | 8.3 (3.7) |
| 4 | 3/4 | Remote | 3573D5212 | 3573D5216 | 3.0 | 9.0 | 7.4 (188) | 6.3 (160) | 7.4 (188) | 8.3 (3.7) |

## Sizes 8, 12, 30






| Valve Size | Port Size | Valve Model Numbers w/ Overrides | w/o Overrides | Average $C_v$ In-Out | Out-Exh. | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|---|---|
| 8 | 1/2 | 3573A4142 | 3573A4162 | 3.5 | 8.5 | 8.5 (216) | 7.1 (180) | 12.3 (312) | 15.3 (6.9) |
| 8 | 3/4 | 3573A5142 | 3573A5162 | 4.0 | 12 | 8.5 (216) | 7.1 (180) | 12.3 (312) | 19.0 (8.6) |
| 12 | 3/4 | 3573A5152 | 3573A5172 | 8.0 | 15 | 9.0 (228) | 8.5 (216) | 13.4 (340) | 19.0 (8.6) |
| 8 | 1 | 3573A6152 | 3573A6172 | 4.0 | 12 | 8.5 (216) | 7.1 (180) | 12.3 (312) | 15.3 (6.9) |
| 12 | 1 | 3573A6162 | 3573A6182 | 8.5 | 19 | 9.0 (228) | 8.5 (216) | 13.4 (340) | 19.0 (8.6) |
| 12 | 1¼ | 3573A7162 | 3573A7182 | 9.0 | 21 | 9.0 (228) | 8.5 (216) | 13.8 (351) | 19.0 (8.6) |
| 30* | 1¼ | 3573A7152 | 3573A7172 | 20 | 42 | 12.4 (314) | 11.1 (282) | 17.7 (450) | 37.5 (16.9) |
| 30* | 1½ | 3573A8162 | 3573A8182 | 21 | 43 | 12.4 (314) | 11.1 (282) | 17.7 (450) | 37.5 (16.9) |

*2 inch port size available on size 30 valves. Order part number 1999H77 flange kit separately.

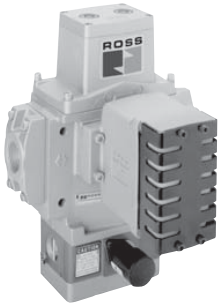
**STANDARD SPECIFICATIONS** (for valves on this page)**:**
**Pilot Solenoids:** Two, rated for continuous duty.
*Standard voltages:* 100-110 volts, 50 Hz; 100-120 volts, 60 Hz; 24 volts DC; 110 volts DC. For other voltages, consult ROSS.
**Power Consumption:**
*Size 4:* Each solenoid, 30 VA inrush, 16 VA holding on 50 or 60 Hz; 11 watts on DC.
*Sizes 8,12,30:* Each solenoid, 87 VA inrush, 30 VA holding on 50 or 60 Hz; 14 watts on DC.
**Electrical Connections:** Size 4 uses cord-grip connectors at solenoids. Order connectors separately on Serpar® size 4 (see page 108); terminal strip on sizes 8, 12 and 30.

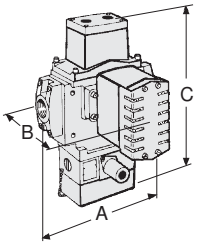
**Ambient Temperature:** 40° to 120°F (4° to 50°C).
**Media Temperature:** 40° to 175°F (4° to 80°C).
**Flow Media:** Filtered air; 5 micron recommended.
**Inlet Pressure:** *Size 4:* 30 to 100 psig (2 to 7 bar).
*Sizes 8,12,30:* 30 to 125 psig (2 to 8.5 bar).
**L-G Reset Pressure:** *Size 4:* Remote pneumatic reset models require a pressure of at least 30 psig (2 bar). Manual reset models use internal valve pressure.
*Sizes 8,12,30:* 60 psig (4 bar) minimum.
**Inlet Port:** Models are available with the inlet port on either the right or the left side of the valve body (size 4 only).

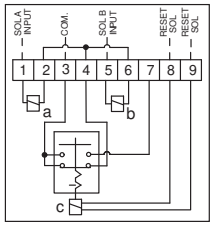
**IMPORTANT NOTE:** Please read carefully and thoroughly all of the **CAUTIONS** on the inside back cover.

# SERPAR® Double Valves with E-P Monitor Series 35

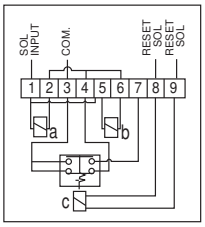
## Sizes 8 to 30



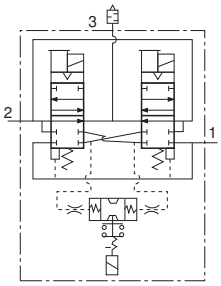



Dual Input Wiring Diagram




Single Input Wiring Diagram



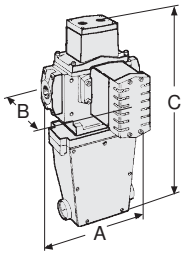

**During lock-out:** Terminals 3 and 7 are connected which allows a panel light, bell, or other electrical device to be wired through terminals 7 and 3 to serve as a lockout indicator.

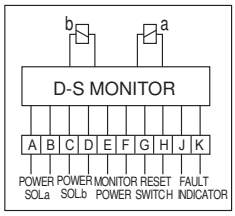
**Valve Model Number**

| Valve Port | | Single Signal Input | | Dual Signal Input | | Avg. $C_v$ | | Dimensions inches (mm) | | | Weight |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Size | Size | w/ Overrides | w/o Overrides | w/ Overrides | w/o Overrides | In-Out | Out-Exh | A | B | C | lb (kg) |
| 8 | 1/2 | 3573A4141 | 3573A4161 | 3573A4341 | 3753A4361 | 3.5 | 8.5 | 8.5 (216) | 7.2 (184) | 11.4 (288) | 11.8 (5.3) |
| 8 | 3/4 | 3573A5141 | 3573A5161 | 3573A5341 | 3573A5361 | 4.0 | 12 | 8.5 (216) | 7.2 (184) | 11.4 (288) | 11.8 (5.3) |
| 12 | 3/4 | 3573A5151 | 3573A5171 | 3573A5351 | 3573A5371 | 8.0 | 15 | 8.6 (219) | 8.6 (219) | 12.0 (303) | 15.5 (7.0) |
| 8 | 1 | 3573A6151 | 3573A6171 | 3573A6351 | 3573A6371 | 4.0 | 12 | 8.5 (216) | 7.2 (184) | 11.4 (288) | 11.8 (5.3) |
| 12 | 1 | 3573A6161 | 3573A6181 | 3573A6361 | 3573A6381 | 8.5 | 19 | 8.6 (219) | 8.6 (219) | 12.0 (303) | 15.5 (7.0) |
| 12 | 1¼ | 3573A7161 | 3573A7181 | 3573A7361 | 3573A7381 | 9.0 | 21 | 9.0 (228) | 8.5 (216) | 12.8 (324) | 15.5 (7.0) |
| 30 | 1¼ | 3573A7151 | 3573A7171 | 3573A7351 | 3573A7371 | 20 | 42 | 12.4 (314) | 11.1 (282) | 17.3 (440) | 35.0 (15.8) |
| 30 | 1½ | 3573A8161 | 3573A8181 | 3573A8361 | 3573A8381 | 21 | 43 | 12.4 (314) | 11.1 (282) | 17.3 (440) | 35.0 (15.8) |

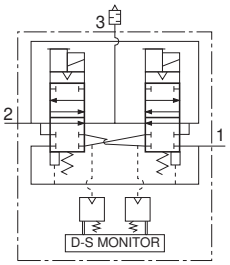
# SERPAR® Double Valves with D-S Monitor Series 35

## Sizes 8 to 30




Wiring Diagram




| Valve Size | Port Size | Valve Model Number w/ Overrides | w/o Overrides | Avg. $C_v$ In-Out | Out-Exh. | Dimensions inches (mm) A | B | C | Weight lb (kg) |
|---|---|---|---|---|---|---|---|---|---|
| 8 | 1/2 | 3573B4143 | 3573B4163 | 3.5 | 8.5 | 8.5 (216) | 7.2 (184) | 16.5 (418) | 16.8 (7.6) |
| 8 | 3/4 | 3573B5143 | 3573B5163 | 4.0 | 12 | 8.5 (216) | 7.2 (184) | 16.5 (418) | 16.8 (7.6) |
| 12 | 3/4 | 3573B5153 | 3573B5173 | 8.0 | 15 | 9.0 (229) | 8.6 (219) | 17.8 (451) | 20.5 (9.2) |
| 8 | 1 | 3573B6153 | 3573B6173 | 4.0 | 12 | 8.5 (216) | 7.2 (184) | 16.5 (418) | 16.8 (7.6) |
| 12 | 1 | 3573B6163 | 3573B6183 | 8.5 | 19 | 9.0 (229) | 8.6 (219) | 17.8 (451) | 20.5 (9.2) |
| 12 | 1¼ | 3573B7163 | 3573B7183 | 9.0 | 21 | 9.0 (229) | 8.6 (219) | 17.8 (451) | 20.5 (9.2) |
| 30* | 1¼ | 3573B7153 | 3573B7173 | 20 | 42 | 12.4 (314) | 11.1 (282) | 21.8 (553) | 39.3 (17.7) |
| 30* | 1½ | 3573B8163 | 3573B8183 | 21 | 43 | 12.4 (314) | 11.1 (282) | 21.8 (553) | 39.3 (17.7) |

*2 inch port size available on size 30 valves. Order part number 1999H77 flange kit separately.

**STANDARD SPECIFICATIONS** (for valves on this page)**:**
**Pilot Solenoids:** Two, rated for continuous duty.
**Standard voltages:** 100-110 volts, 50 Hz; 100-120 volts, 60 Hz; 24 volts DC; 110 volts DC. Other voltages available.
**Power Consumption: Each** solenoid, 87 VA inrush, 30 VA holding on 50 or 60 Hz; 14 watts on DC.
**E-P Reset Solenoid:** Rated for *intermittent* duty.
Voltages: 24-48 or 100-120 volts AC or DC (for E-P only).

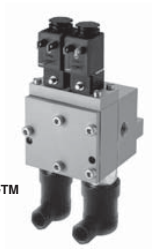
**D-S Monitor:** Uses same voltage and frequency as pilot solenoids, but power supply must be independent and continuous. Standard Voltages: 100-110 volts 50 Hz; 100-120 volts 60 Hz; 24 volts DC (no other voltages available for D-S).
**Ambient Temperature:** 40° to 120°F (4° to 50°C).
**Media Temperature:** 40° to 175°F (4° to 80°C).
**Flow Media:** Filtered air; 5 micron recommended.
**Pressure Range:** 30 to 125 psig (2 to 8.5 bar).

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

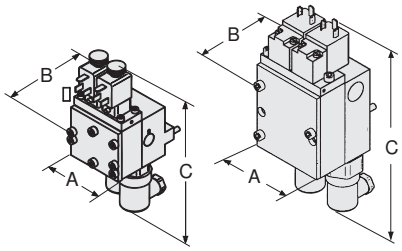
# Crossflow™ Double Valves* Series 35

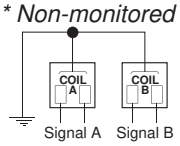
## Size 1 & 2

EMIII HZ 97170


Crossflow™ Size 1


Crossflow™ Size 2




| Valve Size | Model Number* | Avg. $C_v$ 1-2 | Avg. $C_v$ 2-3 | Pressure Switches** | Press. Switch Provision | Port Sizes 1 & 2 | Port Sizes 3 | Dimensions inches (mm) A | B | C | Avg. Response Constants M | F In-Out | F Out-Exh. | Weight lb (kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 3573B2632 | 0.9 | 1.4 | None | Yes | 1/4 | 1/4 | 2.7 (69) | 3.3 (84) | 5.0 (127) | 28 | 4.6 | 3.4 | 2.1 (95) |
| 1 | 3573B2640 | 0.9 | 1.4 | None | No | 1/4 | 3/8 | 2.7 (69) | 3.3 (84) | 5.0 (127) | 24 | 4.4 | 3.1 | 2.1 (95) |
| 1 | 3573B2642 | 0.9 | 1.4 | Two | Yes | 1/4 | 1/4 | 2.7 (69) | 3.3 (84) | 7.5 (191) | 28 | 4.6 | 3.4 | 2.5 (1.14) |
| 1 | 3573B2644 | 1.2 | 1.7 | Two | Yes | 3/8 | 3/8 | 2.7 (69) | 3.3 (84) | 7.6 (195) | 25 | 3.1 | 2.8 | 2.9 (1.32) |
| 1 | 3573B2645 | 1.2 | 1.7 | None | Yes | 3/8 | 3/8 | 2.7 (69) | 3.3 (84) | 5.1 (130) | 25 | 3.1 | 2.8 | 2.5 (1.14) |
| 2 | 3573B4620 | 3.7 | 6.6 | None | No | 1/2 | 1/2 | 3.4 (86) | 3.2 (81) | 6.3 (160) | 30 | 1.2 | 1.0 | 4.3 (1.95) |
| 2 | 3573B4632 | 3.7 | 6.6 | None | Yes | 1/2 | 1/2 | 3.4 (86) | 3.2 (81) | 6.5 (165) | 30 | 1.2 | 1.0 | 4.3 (1.95) |
| 2 | 3573B4640 | 3.7 | 9.0 | None | No | 1/2 | 3/4 | 3.4 (86) | 3.2 (81) | 6.5 (165) | 25 | 1.1 | 0.9 | 4.3 (1.95) |
| 2 | 3573B4642 | 3.7 | 6.6 | Two | Yes | 1/2 | 1/2 | 3.4 (86) | 3.2 (81) | 9.0 (229) | 30 | 1.2 | 1.0 | 4.8 (2.18) |
| 2 | 3573B4643 | 4.2 | 9.0 | None | No | 3/4 | 3/4 | 3.4 (86) | 3.2 (81) | 6.5 (165) | 25 | 1.1 | 0.9 | 4.7 (2.13) |
| 2 | 3573B4644 | 4.2 | 9.0 | Two | Yes | 3/4 | 3/4 | 3.4 (86) | 3.2 (81) | 9.0 (165) | 25 | 1.1 | 0.9 | 5.2 (2.36) |
| 2 | 3573B4645 | 4.2 | 9.0 | None | Yes | 3/4 | 3/4 | 3.4 (86) | 3.2 (81) | 6.5 (165) | 25 | 1.1 | 0.9 | 4.7 (2.13) |
| 2 | 3573B4652 | 3.7 | 9.0 | None | Yes | 1/2 | 3/4 | 3.4 (86) | 3.2 (81) | 9.0 (165) | 25 | 1.1 | 0.9 | 4.3 (1.95) |

* Model number includes base. For BSPP threads, order with a "D" prefix. For JIS threads, order with a "J" prefix. Valve and base can be ordered separately; consult ROSS.
** Only valves with pressure switches should be used to control clutch/brake mechanisms on press machinery. The pressure switches must be used in conjunction with a monitoring device to assist with OSHA compliance (Ref. 1910.217).

## Valve Response Time

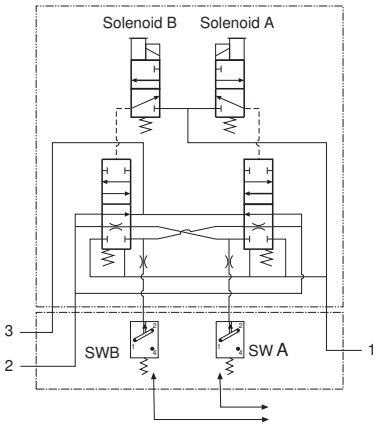
The constants below, designated M and F, can be used to determine the amount of time required to fill or exhaust a volume of any size using the following formula:

**Vlv. Resp. Time (msec)= M + F *V**

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

## *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). The valves on this page do not have a built-in monitor, and must only be used in conjunction with an external monitoring system. Such monitoring system must be capable of inhibiting the operation of the valve in the event of a failure within the valve.




**To customer's external monitor**

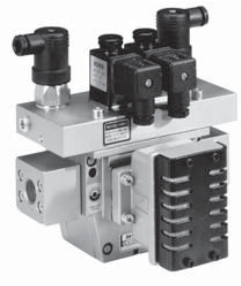
**STANDARD SPECIFICATIONS** (for valves on this page)**:**
**Pilot Solenoids:** Two, rated for continuous duty.
**Standard Voltages:** 100-110 volts, 50 Hz; 100-120 volts, 60 Hz; 24 volts DC; 110 volts DC. For other voltages, consult ROSS.
**Power Consumption:**
*Size 1:* Each solenoid, 12 VA maximum inrush, 9.8 VA maximum holding on 50 or 60 Hz; 7.5 watts nominal on DC.
*Size 2:* Each solenoid, 8.5 VA maximum inrush, 8.5 VA maximum holding on 50 or 60 Hz; 6 watts maximum on DC.

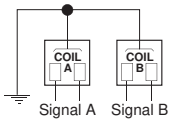
**Electrical Connections:** Uses two cord-grip connectors at solenoids (order separately).
*Size 1: DIN 43650 Form B connector P/N 266K77.*
*Size 2: Din 43650 Form A connector P/N 937K87.*
**Ambient Temperature:** 40° to 120°F (4° to 50°C).
**Media Temperature:** 40° to 175°F (4° to 80°C).
**Flow Media:** Filtered air; 5 micron recommended.
**Inlet Pressure:** 40 to 100 psig (2.8 to 7 bar).
**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.

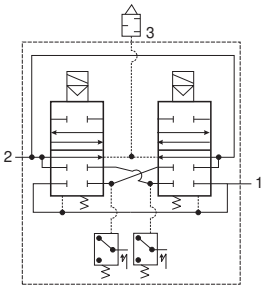
**IMPORTANT NOTE:** Please read carefully and thoroughly all of the **CAUTIONS** on the inside back cover.

# Crossflow™ Double Valves with Pressure Switches* Series 35

## Size 4



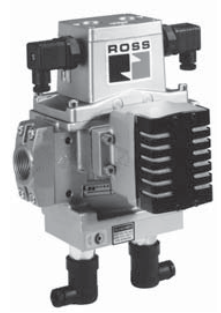


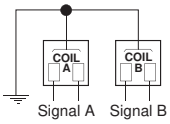



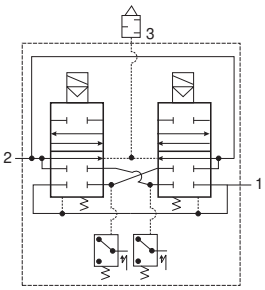

| Valve Size | Port Size | Model Number* Flanged Ports Inlet Right | Inlet Left | Standard Flow SCFM/Min (l/sec.) | Weight lb (kg) |
|---|---|---|---|---|---|
| 4 | 3/8 | 3573C3270 | 3573C3276 | 190 (90) | 8.4 (3.8) |
| 4 | 1/2 | 3573C4270 | 3573C4276 | 190 (90) | 8.4 (3.8) |
| 4 | 3/4 | 3573C5230 | 3573C5236 | 190 (90) | 8.4 (3.8) |

*NPT port threads. For BSPP threads, order base with a "D" prefix.

## Sizes 8, 12, 30




| Valve Size | Port Size | Model Number* Flanged Ports | Standard Flow SCFM/Min. (l/sec.) | Weight lb (kg) |
|---|---|---|---|---|
| 8 | 1/2 | 3573B4638 | 297 (140) | 11.4 (5.2) |
| 8 | 3/4 | 3573B5638 | 297 (140) | 11.4 (5.2) |
| 8 | 1 | 3573B6638 | 297 (140) | 11.4 (5.2) |
| 12 | 3/4 | 3573B5632 | 297 (140) | 11.4 (5.2) |
| 12 | 1 | 3573B6632 | 297 (140) | 11.4 (5.2) |
| 12 | 1¼ | 3573B7632 | 297 (140) | 11.4 (5.2) |
| 30 | 1¼ | 3573B7630 | 1,800 (850) | 33.9 (15.4) |
| 30 | 1½ | 3573B8630 | 1,800 (850) | 33.9 (15.4) |

*NPT port threads. For BSPP threads, order base with a "D" prefix.

## * 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).

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.

**STANDARD SPECIFICATIONS** (for valves on this page)**:**
**Pilot Solenoids:** Two, rated for continuous duty.
**Standard Voltages:** 24, 48, 110, 220 volts AC, 50/60 Hz; 24 volts DC; 110 volts DC. For other voltages, consult ROSS.
*Voltages at pressure switches must not exceed 250 volts.*
**Power Consumption:**
***Size 4:***
Each solenoid: 35 VA maximum in-rush, 22 VA holding on 50 or 60 Hz; 14 watts nominal on DC.
***Size 8, 12, 30:***
Each solenoid: 87 VA maximum in-rush, 30 VA holding on 50 or 60 Hz; 14 watts nominal on DC.
**Electrical Connections:** Uses cord-grip connectors at solenoids. Order connectors separately (see page 104).

**Electrical Connection**:
Connectors according to DIN 43650 A (ISO 4400), must be ordered separately.
**Ambient Temperature:** 40° to 120°F (4° to 50°C).
**Flow Media:** Filtered air; 5 micron recommended.
**Inlet Pressure:**
*Size 4:* 40 to 150 psig (2.5 to 10 bar).
*Size 8, 12, 30:* 30 to 125 psig (2 to 8.5 bar).
**Media Temperature:** 40° to 175°F (4° to 80°C).
Enclosure Rating: IP 65 according to IEC-Publication 144 and DIN 40050, Sheet 1.
**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.

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

# Accessories

## 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 by ordering part number: **670B94**.

## ELECTRICAL CONNECTORS

Electrical connectors are required to connect the valve solenoids to the drop cords supplying electrical power. Each connector can be positioned so that the cord exits upward or to the side. Cords of 6 mm to 10 mm diameter can be used. Connectors with a light in a translucent housing are also available to serve as indicator lights. Order connectors by the part numbers given in the chart below.

**WIRED CONNECTORS** have a 2 meter (6½ ft) cord with three 18 gauge conductors. Cord exits upward, and is available in either 6 mm or 10 mm diameter.

**CONNECTORS for THREADED CONDUIT** accept 1/2 inch electrical conduit fittings.

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

## RESET VALVES for MODELS with REMOTE RESET

On valve models with solenoid reset, a solenoid on the valve is actuated 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 double valve. ROSS offers 3/2 normally closed valves with either manual or electric control that are suitable for this purpose. The valves, pictured below, are suggested.

**Model Numbers of Reset Valves**

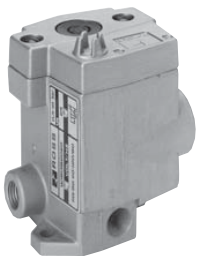
| Description | Valve Model Numbers |
|---|---|
| Pushbutton: Green | 1223A1005 |
| Direct Solenoid Control for line mounting | 1613B1020* |
| Direct Solenoid Control for base mounting | W1413A1409* (Base: 516B91) |

**Port threads:** NPT standard. For BSPP threads, add a "D" prefix to the model number, e.g., D1223A1005. In the case of the W1413A1409, the prefix should be added to the base model instead of the valve.

**Part Numbers of Electrical Connectors**

| Connector Type | Without Light | With Light* |
|---|---|---|
| For use with dropcord (Cord not included) | 937K87 | 936K87* |
| Wired with 6-mm cord | 721K77 | 720K77* |
| Wired with 10-mm cord | 371K77 | 383K77* |
| For use with threaded conduit | 723K77 | 724K77* |

**Direct Solenoid Model for Line Mounting:** 1613B1020*



**Direct Solenoid Mode for Base Mounting**
Valve: W1413A1409*
Sub-Base: 516B91

**Pushbutton Models**
Green button: 1223A1005

* Specify solenoid voltage and Hz when ordering.

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

# MODEL NUMBER INDEX



If your part number is not listed, consult ROSS or your local ROSS distributor.

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# MODEL NUMBER INDEX



If your part number is not listed, consult ROSS or your local ROSS distributor.

## MODEL NUMBER INDEX



# Additional ROSS Literature

| Catalog/Bulletin Number (If Applicable) | Description | Form Number |
|---|---|---|
| 200 | Dale Series Poppet and Manifold Valves | A10343 |
| 600 | ROSS ISO Valves and Serial Bus Communication | A10309 |
| 450 | Modular Press Solutions | A10155 |
| N/A | Fluid Power Safety for Machine Guarding | A10264 |
| 505 | DM$^{2®}$ 3/2 Double Valves with Total Dynamic Monitoring and Memory | A10295 |
| 510 | Safety-Related Products | A10296 |
| 420 | Filters, Pressure Regulators, Lubricators, Silencers, and Reclassifiers - Including MD4$^{TM}$ Series | A10120 |

To order any of the catalogs/bulletins listed above, contact ROSS or your local ROSS distributor.
The above literature can also be downloaded in PDF format at www.rosscontrols.com.

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# 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**

| Prefix Letter | Pneumatic Port Threads | Threaded Electrical Opening |
|---|---|---|
| None | NPT (ANSI B2.1) | NPT |
| **C*** | ISO 228/1, DIN 259 Parallel, BSPP | — |
| **D** | ISO 228/1, DIN 259 Parallel, BSPP | G |
| **J** | JIS B0203 Tapered | ISO |
| **S** | SAE 1926- ISO 11926 | NPT |

*Used only for filters, regulators, lubricators.

### Flow Ratings

Flow ratings are expressed as $C_V$ where $C_V$ = 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 $C_V$ values, the figures given in this catalog should not be used to compare ROSS valves with those of other makers. The $C_V$ ratings given here are intended only for use with performance charts published by ROSS. The $C_V$ 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.

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.

For example: Model 2773B5001, 120 volts, 60 Hz.
Model W6076B2401, 220 volts, 50 Hz.

### 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 on the back cover of this catalog.**

# Cautions

**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. 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.

*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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*This catalog presents an overview of the extensive ROSS product line. Other literature is available for engineering, maintenance, and service requirements. If you need products or specifications not shown here, please contact ROSS or your ROSS distributor. They will be happy to assist you in selecting the best product for your application.*

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