

ROSS[®]
FLUID POWER
PRODUCTS
FOR PNEUMATIC
SOLUTIONS

• *Manufacturers of Premium Pneumatic Controls since 1921* •



Consider it **DONE!**

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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!



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

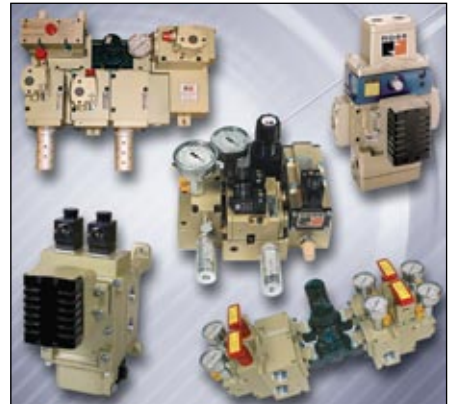
For details, visit the Hollow Glass page at www.rosscontrols.com.



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 page at www.rosscontrols.com.



Steel Industry & Primary Metals Processing Products

- Valve stands, panels & enclosures
- High flow, dirt tolerant valve accessories
- High flow FRLs
- 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 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,
- DM¹ Series E, DM² Series E and C
- Manual and solenoid L-O-X[®] valves for energy isolation
- EEZ-ON[®] valves for gradual start-up
- Manual L-O-X[®] with EEZ-ON[®] operation
- Modular L-O-X[®] air entry combination
- SV27 Category 2 Monitored in-line valves
- Pilot operated check valves (single/double channel sensing available)
- Check valves
- HSR[®] two-hand antie-tie-down controls
- HOZE-FUZE[®] to prevent hose whip
- Silencers & reclassifiers
- Lockout verification accessories

For details, visit the Safety 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 Controls
- Safety Systems

For details, visit the Aluminum 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

Visit www.rosscontrols.com to download our literature in PDF format.

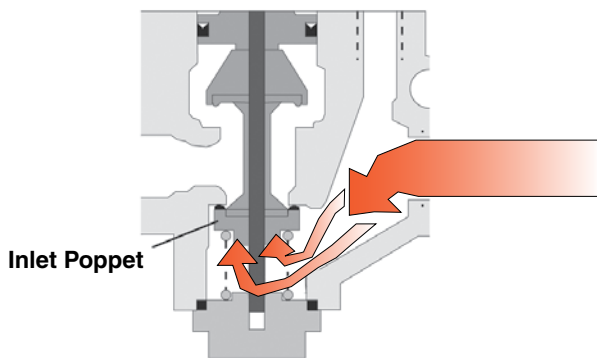


The ROSS Poppet Valve . . . A ROSS Speciality from the Beginning

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.

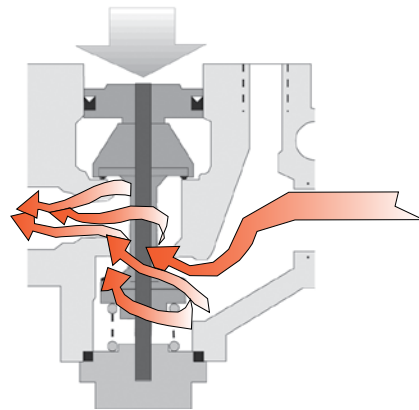
Pilot air pressure, working on a large piston, produces a very strong actuating force.



Self-Cleaning and Dirt Tolerant

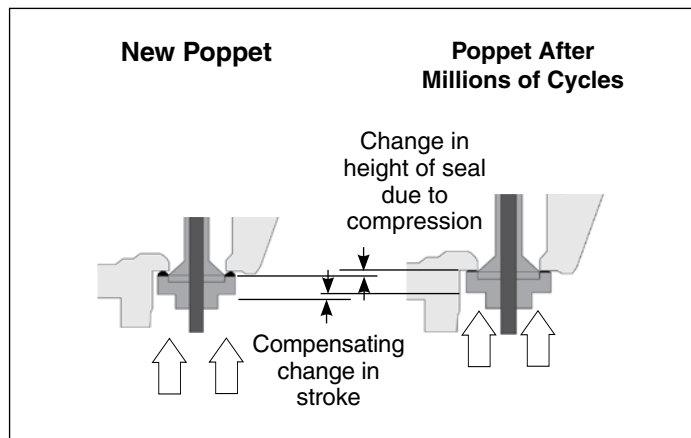
The flow velocity for a given volume of air is dependent upon the area through which it is flowing. The smaller the area, the greater the velocity.

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

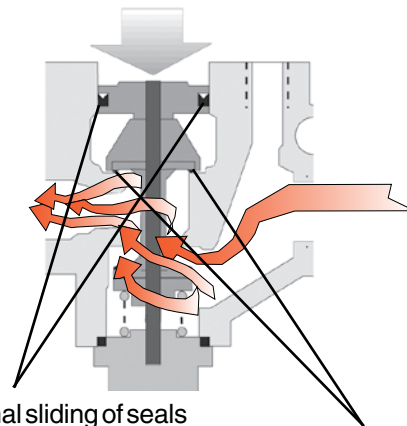
Because of its superior design, any change in the height of the valve seal (due to compression) is automatically compensated for by an equal change in the length of stroke.



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.



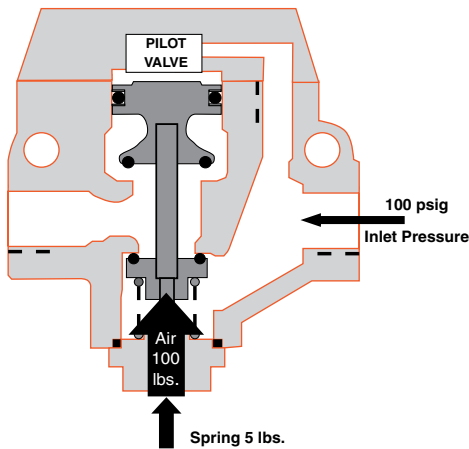
There is minimal sliding of seals in a poppet valve (sliding seals are highly prone to varnish). The friction and therefore, the repeatability, remain consistent for millions of cycles.

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.

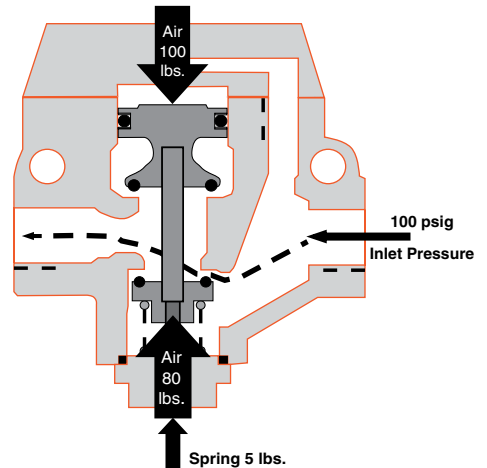
1 - Valve Not Actuated



Net Upward Force: 85 lb.

This force keeps the inlet poppet well sealed.

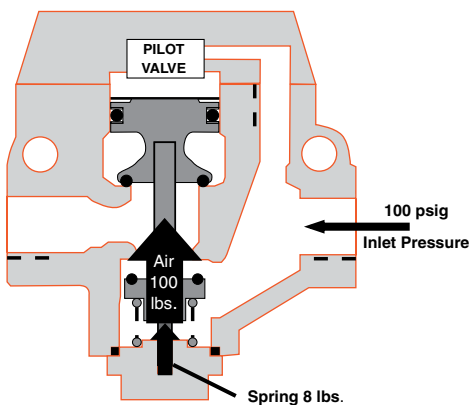
2 - Actuating Signal Applied



Net Downward Force: 75 lb.

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.

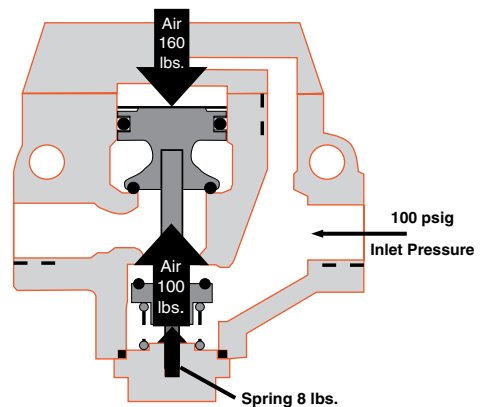
3 - Valve Actuated



Net Downward Force: 52 lb.

This force seals the exhaust poppet and holds the valve element open.

4 - De-actuating Signal Removed



Net Upward Force: 108 lb.

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 top left illustration).

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

Poppet- ISO W64, ANSI W74, SAE 84 Series

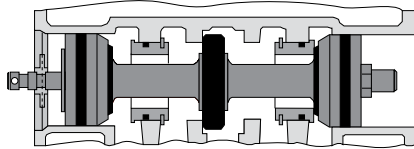
Poppet surfaces face-seal against flat poppet seats.

FEATURES

- Large pilot pistons
- Mechanical detents
- Self-cleaning
- Short stroke
- Viton 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

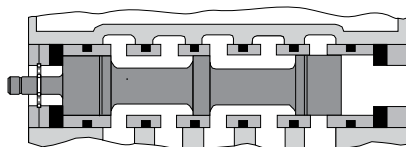
FEATURES

- 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.

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



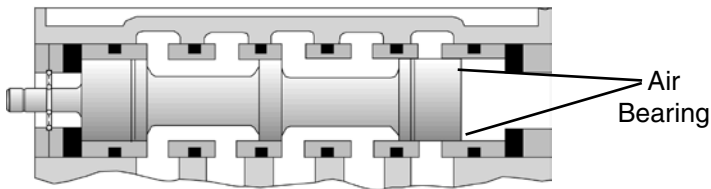
APPLICATIONS

- 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!

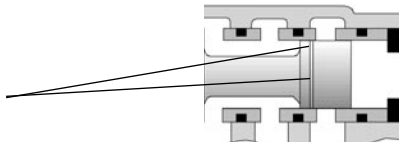
Balanced Design

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.



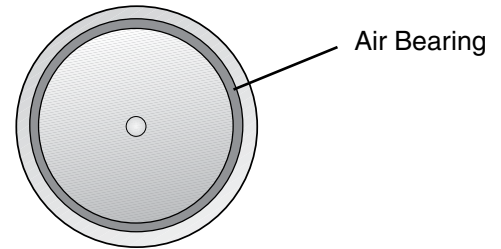
Air Bearing

Illustration of micro air-bearing concept



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.



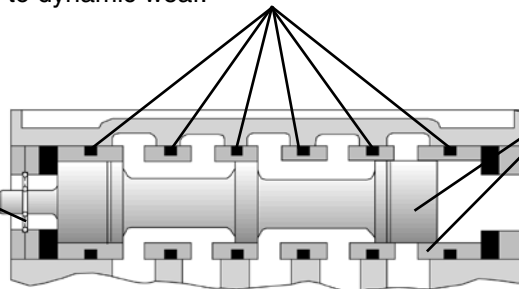
Air Bearing

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

Other Significant Features

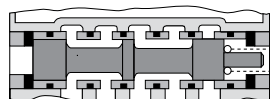
O-rings isolate the precision steel sleeve from valve body and mounting torque distortions. O-rings are static and are not subject to dynamic wear.

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

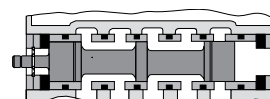


The stainless steel spool and sleeve are matched and selectively assembled to maintain a clearance of 1 to 2 ten-thousandths of an inch over the diameter. The stainless steel components are also immune to most chemicals.

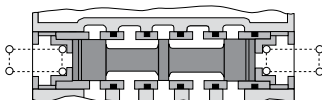
Spool valve construction can be made in 2 and 3 position functions.



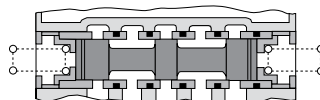
Single Control
(2 position)



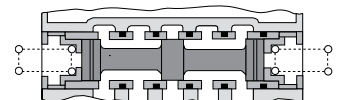
Double Momentary [Impulse] Control
(2 position)



Power Center, Double Control
(3 position)



Closed Center, Double Control
(3 position)

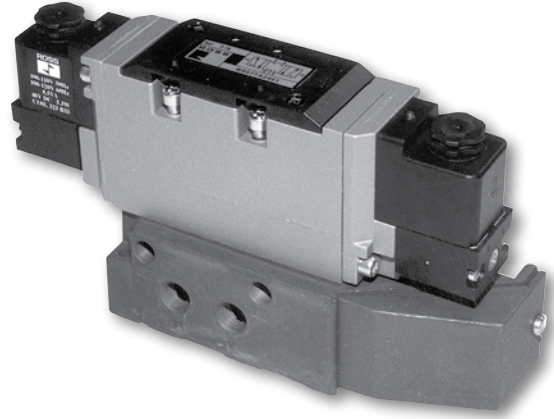


Open Center, Double Control
(3 position)

ROSS Offers a Wide Range of Products for Base or Line Mounting

Features of ROSS Base-Mount Valves

1. All piping is to the base, not the valve, for easy valve removal and servicing.
2. Valves mount on standard ISO, ANSI, or SAE bases.
3. Available in poppet, stainless steel spool & sleeve, or resilient seal spool constructions.
4. Valves are fully-interchangeable with any other valves using a standard mounting interface.
5. Valves are easily manifold mounted, for compact multi-valve installations.
6. Two and three position valves available in all sizes.
7. Port sizes up to 1½", C_v ratings up to 22.
8. Electrical connections provided by body-to-base/plug-in base (ANSI or ISO 5599/II), drop-cord plug (ISO5599/I), and 3 or 5-pin connectors (SAE).
9. Variety of interposed control devices are available.

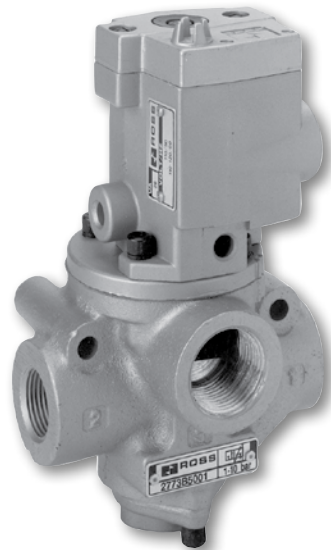


Base-Mount

Choose the Best Valve for Your Requirements Without Making Compromises.

Features of ROSS Line-Mount Valves

1. Low weight; compact size.
2. **LOGICAIR**® adaptors provide special functions:
 - Timed sequence actuation and/or deactuation
 - Momentary control of actuation/deactuation from one pressure source
 - Actuating force multiplier, for use with low signal pressures.
3. Available with choices of internal components for three different temperature ranges.
4. Choose from five flow patterns: 2/2 normally-open/-closed, 3/2 normally-open/closed, or 4/2 designs.
5. Port sizes up to 2½"; C_v ratings up to 70.
6. Can be mounted close to actuator, reducing length of pipe to be pressurized/exhausted on each cycle.
7. Long life expectancy.
8. Consistent response times over the life of the valve.

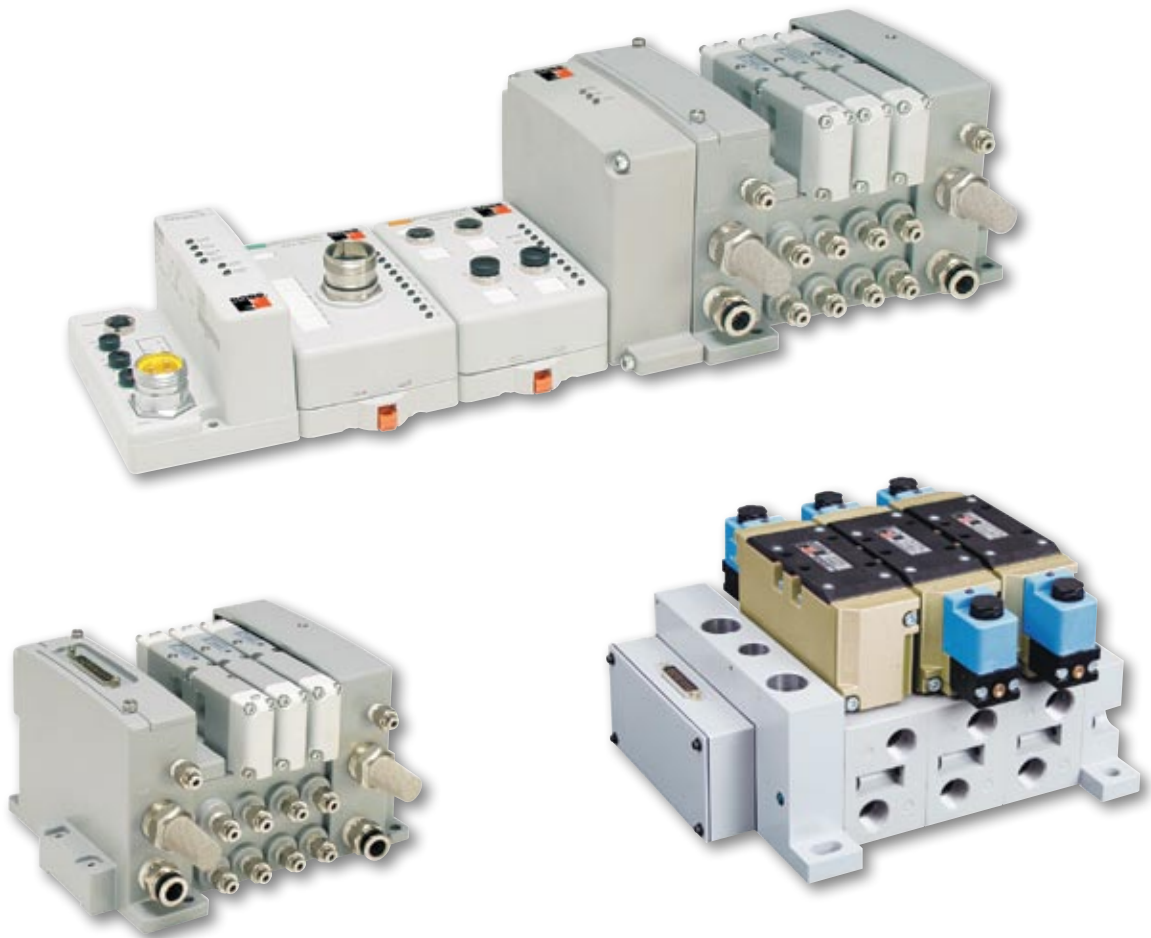


Line-Mount

ISO Valves and Serial Bus Communication from ROSS CONTROLS®

For more information please refer to

BULLETIN 600

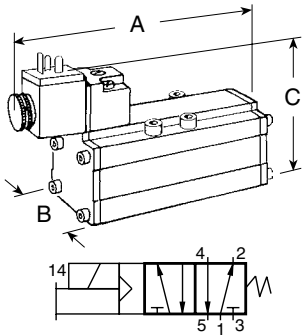


Please visit the ROSS web site to view the complete Bulletin 600 (Form #A10309)
at www.rosscontrols.com.



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

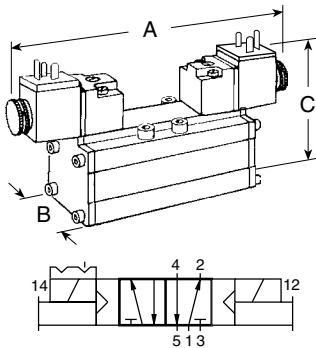
5/2 Valves – Single Solenoid Pilot Controlled, Spring Return



ISO Size	Range of Port Sizes	Valve Model Number*	Avg. C _v	Dimensions inches (mm)			Weight lb (kg)
				A	B	C	
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)

* Base and electrical connector not included. See pages 18-19 for accessories.

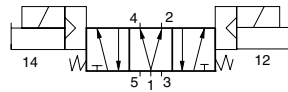
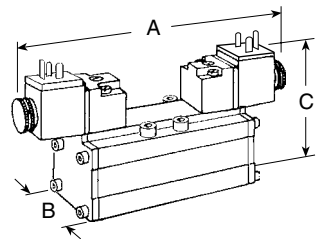
5/2 Valves – Double Solenoid Pilot Controlled, Detented



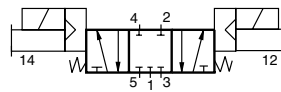
ISO Size	Range of Port Sizes	Valve Model Number*	Avg. C _v	Dimensions inches (mm)			Weight lb (kg)
				A	B	C	
1	1/8 - 3/8	W6076B2407	0.8	6.59 (167.4)	1.64 (41.7)	3.25 (82.6)	1.8 (0.9)
2	3/8 - 1/2	W6076B3407	1.9	7.39 (187.7)	2.10 (53.4)	3.55 (90.2)	2.7 (1.2)
3	1/2 - 3/4	W6076B4407	3.8	6.62 (168.2)	2.55 (64.8)	3.73 (94.8)	3.9 (1.8)

* Base and electrical connector not included. See pages 18-19 for accessories.

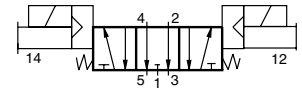
5/3 Valves – Double Solenoid Pilot Controlled



Power Center



Closed Center



Open Center

ISO Size	Range of Port Sizes	Valve Model Number*			Avg. C _v	Dimensions inches (mm)			Weight lb (kg)
		Power Center	Closed Center	Open Center		A	B	C	
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)

* Base and electrical connector not included. See pages 18-19 for 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 110; 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.

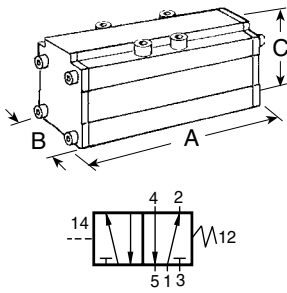
Manual Override: Flush, non-locking.

IMPORTANT NOTE

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

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

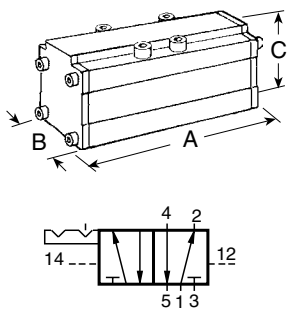
5/2 Valves – Single Pressure Controlled, Spring Return



ISO Size	Range of Port Sizes	Valve Model Number*	Avg. C_v	Dimensions inches (mm)			Weight lb (kg)
				A	B	C	
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)

* Base not included. See pages 18-19 for accessories.

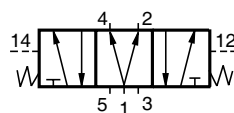
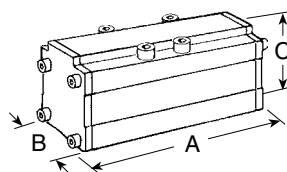
5/2 Valves – Double Pressure Controlled, Detented



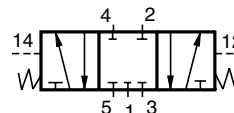
ISO Size	Range of Port Sizes	Valve Model Number*	Avg. C_v	Dimensions inches (mm)			Weight lb (kg)
				A	B	C	
1	1/8 - 3/8	W6056B2417	0.8	4.1(105)	1.7 (42)	1.8 (47)	0.8 (0.4)
2	3/8 - 1/2	W6056B3417	1.9	5.0 (126)	2.1 (54)	2.1 (54)	1.5 (0.7)
3	1/2 - 3/4	W6056B4417	3.8	6.0 (152)	2.6 (65)	2.6 (65)	3.0 (1.4)

* Base not included. See pages 18-19 for accessories.

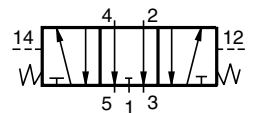
5/3 Valves – Double Pressure Controlled



Power Center



Closed Center



Open Center

ISO Size	Range of Port Sizes	Valve Model Number*			Avg. C_v	Dimensions inches (mm)			Weight lb (kg)
		Power Center	Closed Center	Open Center		A	B	C	
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)

* Base not included. See pages 18-19 for 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.



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

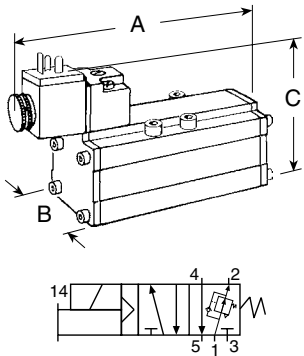


Traditionally, standard valves apply the same pressure for extending and retracting double acting cylinders. However, this new ENERGYSAVER® valve revolutionizes the way cylinders are controlled, by reducing the cylinder retract pressure.



Reduces compressed air consumption up to 30%.

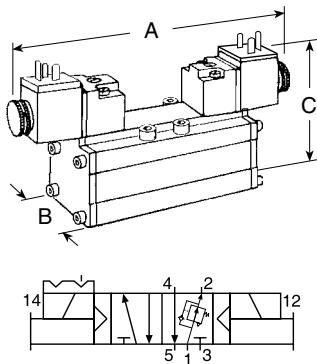
5/2 Valves – Single Solenoid Pilot Controlled, Spring Return



ISO Size	Range of Port Sizes	Valve Model Number*	Avg. C _v	Dimensions inches (mm)			Weight lb (kg)
				A	B	C	
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)

* Base and electrical connector not included. See pages 18-19 for accessories.

5/2 Valves – Double Solenoid Pilot Controlled, Detented



ISO Size	Range of Port Sizes	Valve Model Number*	Avg. C _v	Dimensions inches (mm)			Weight lb (kg)
				A	B	C	
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)

* Base and electrical connector not included. See pages 18-19 for 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.

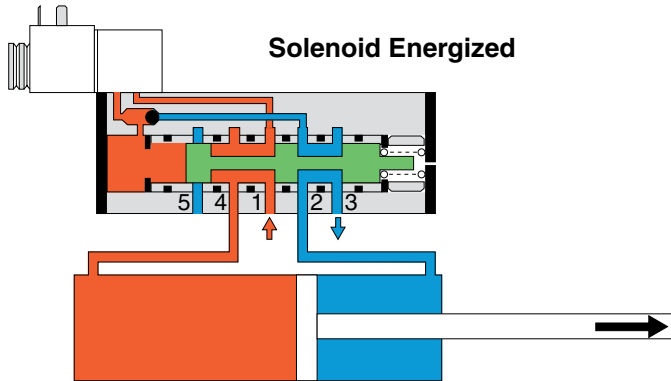
IMPORTANT NOTE

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

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

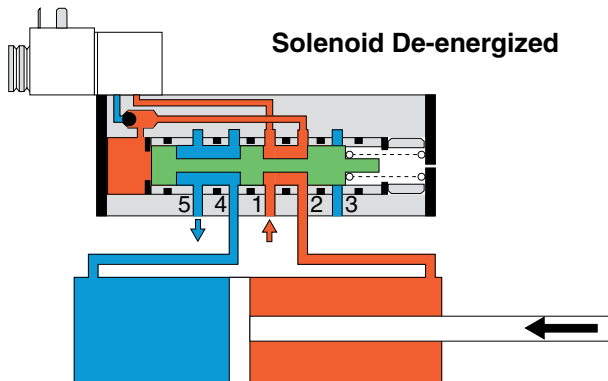
The Series W60 ENERGYSAVER® valve is a 5-port, 2-position, sub-base mounted valve that supplies full line pressure to port 4 and reduced pressure (30 psig - 2 bar) to port 2. This provides full cylinder force to move the load, but returns the cylinder with less pressure thus reducing your compressed 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



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.

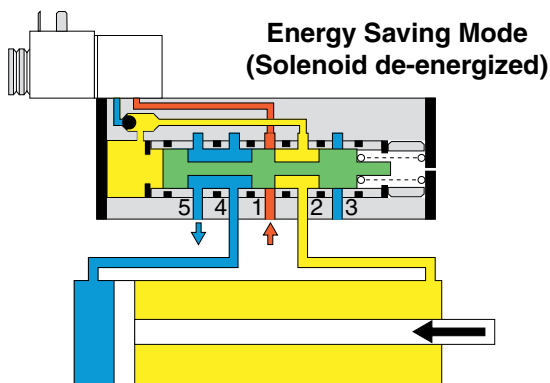
When the solenoid is energized, the ENERGYSAVER® valve operates as a standard valve. Supply pressure is directed from the inlet port to port 4 extending the cylinder at full pressure and force. Air in the rod end of the cylinder is exhausted via port 3.



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.



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.

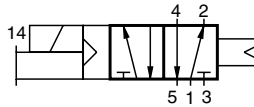
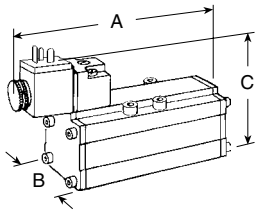
This pressure drop reduces the amount of force available to keep the spool actuated against the valve return spring. So, the spool starts to shift back thus allowing an influx of pressure to help retract the cylinder.

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.

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

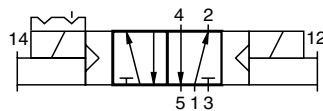
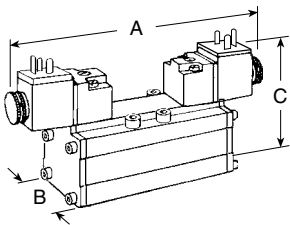
5/2 Valves – Single Solenoid Pilot Controlled, Air Return



ISO Size	Range of Port Sizes	Valve Model Number*		Avg. C_v	Dimensions inches (mm)			Weight lb (kg)
		Std. Temp.	High Temp.		A	B	C	
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)

* Base and electrical connector not included. See pages 18-19 for accessories.

5/2 Valves – Double Solenoid Pilot Controlled, Detented



ISO Size	Range of Port Sizes	Valve Model Number*		Avg. C_v	Dimensions inches (mm)			Weight lb (kg)
		Std. Temp.	High Temp.		A	B	C	
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)

* Base and electrical connector not included. See pages 18-19 for accessories.

Electrical connection conforming to ANSI standard B93.55M is available. For more information, refer to ROSS Bulletin 397B (form number A10090).

STANDARD SPECIFICATIONS: For valves on this page.

Solenoids: AC or DC power.

Standard Voltages: See page 110; 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.

Flow Media: Filtered air; 5 micron recommended.

Inlet Pressure: 30 to 150 psig (2-10 bar).

Pilot Pressure: Must be equal to or greater than inlet pressure.

Internal/External Supply: Selected automatically.

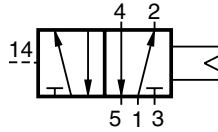
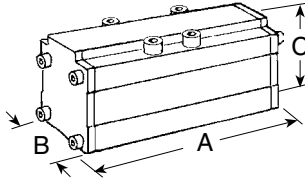
Manual Override: Flush, non-locking.

IMPORTANT NOTE

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

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

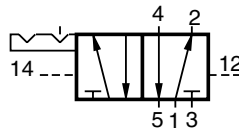
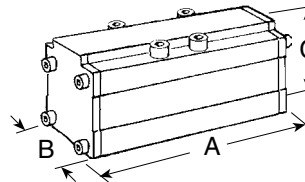
5/2 Valves – Single Pressure Controlled, Air Return



ISO Size	Range of Port Sizes	Valve Model Number*		Avg. C_v	Dimensions inches (mm)			Weight lb (kg)
		Std. Temp.	High Temp.		A	B	C	
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)

* Base not included. See pages 18-19 for accessories.

5/2 Valves – Double Pressure Controlled, Detented



ISO Size	Range of Port Sizes	Valve Model Number*		Avg. C_v	Dimensions inches (mm)			Weight lb (kg)
		Std. Temp.	High Temp.		A	B	C	
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)

* Base not included. See pages 18-19 for accessories.

STANDARD SPECIFICATIONS: For valves on this page.

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.

Flow Media: Filtered air; 5 micron recommended.

Inlet Pressure: 30 to 150 psig (2 to 10 bar).

Pilot Pressure: Must be equal to or greater than inlet pressure.

IMPORTANT NOTE

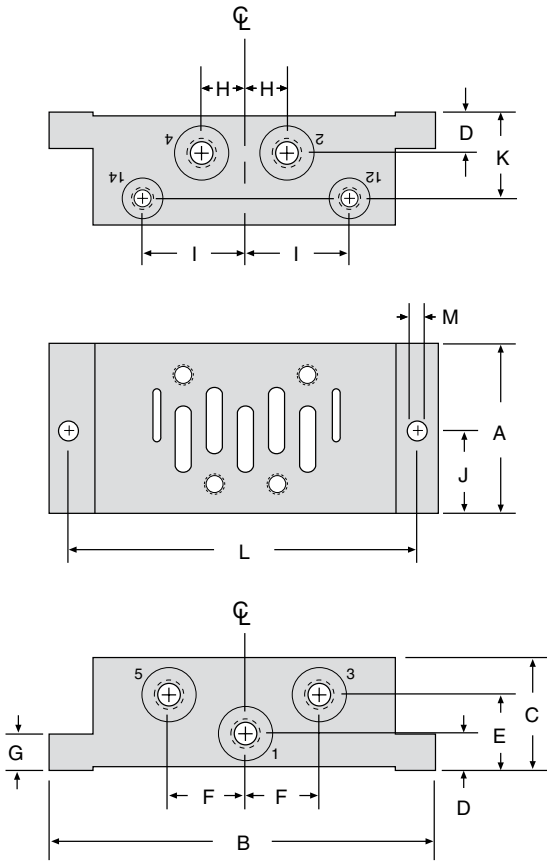
Please read carefully and thoroughly all of the **CAUTIONS** on the inside back cover.



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

SUB-BASE NUMBERS and PORT SIZES

ISO Size	Side Ported	Bottom Ported	Port Sizes		
			1, 2, 4	3, 5	12, 14
1	654K91	—	1/8	1/4	1/8
	600C01	659K91	1/4	1/4	1/8
	D600C01	—	G1/4	G1/4	G1/8
	642K91	—	3/8	3/8	1/8
2	601C01	660K91	3/8	3/8	1/8
	D601C01	—	G3/8	G3/8	G1/8
	643K91	—	1/2	1/2	1/8
3	602C01	661K91	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)

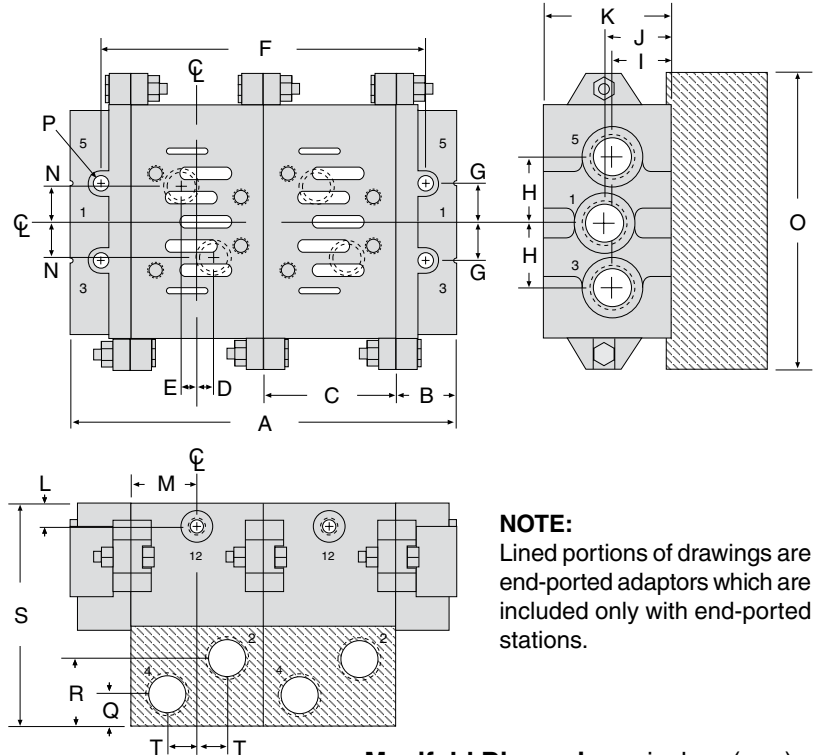
* 1.77 (45) on sub-base 644K91.

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.

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)

ACCESSORIES and OPTIONS for MANIFOLDS

Blank Station Kits, Blocking Discs, Pressure Plates, Transition Plates and other available options are shown on page 19.

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.

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



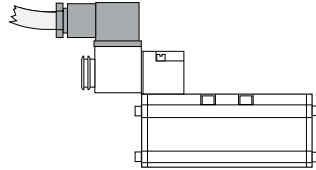
CONNECTORS for use with DROPCORDS (DIN 43650, Form A)

Electrical connectors are required to connect the valve solenoids to the dropcords 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

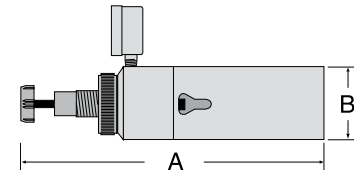
BLOCKING DISKS

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

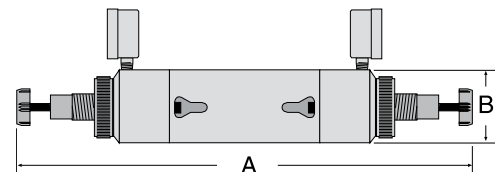
	Single Disk	Kit of 3 Disks
ISO Size 1:	235A40	1007K77
ISO Size 2:	236A40	1008K77
ISO Size 3:	253A40	1009K77

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

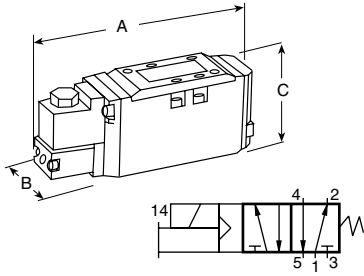
Regulator Dimensions - inches (mm)

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)



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

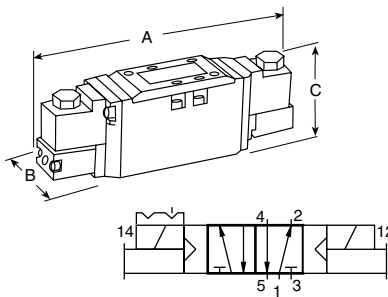
5/2 Valves – Single Solenoid Pilot Controlled, Spring Return



ISO Size	Port Size	Valve Model Number*	Avg. C _v	Dimensions inches (mm)			Weight lb (kg)
				A	B	C	
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)

*See pages 22-24 for accessories.

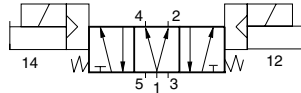
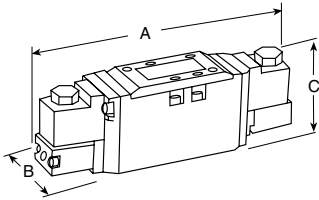
5/2 Valves – Double Solenoid Pilot Controlled, Detented



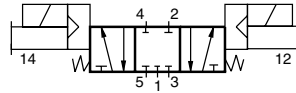
ISO Size	Port Size	Valve Model Number*	Avg. C _v	Dimensions inches (mm)			Weight lb (kg)
				A	B	C	
1	1/4 - 3/8	W6576A2407	1.0	8.8 (224)	1.6 (41)	2.7 (69)	2.0 (1.0)
2	3/8 - 1/2	W6576A3407	2.3	9.0 (228)	2.1 (52)	2.8 (71)	2.5 (1.2)
3	1/2 - 3/4	W6576A4407	3.4	10.0 (254)	2.6 (67)	3.1 (78)	4.0 (1.9)

*See pages 22-24 for accessories.

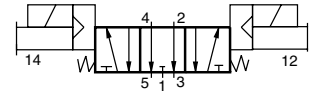
5/3 Valves – Double Solenoid Pilot Controlled



Power Center



Closed Center



Open Center

ISO Size	Port Size	Valve Model Number*			Avg. C _v	Dimensions inches (mm)			Weight lb (kg)
		Power Center	Closed Center	Open Center		A	B	C	
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)

* See pages 22-24 for accessories.

The W65 Series has a base electrical connector which eliminates the need to disconnect wires to remove the valve. This eliminates dropcords, 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.

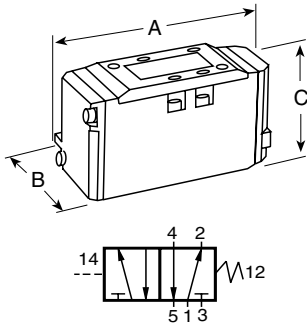
Required pressure at least 30 psig (2 bar).

IMPORTANT NOTE

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

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

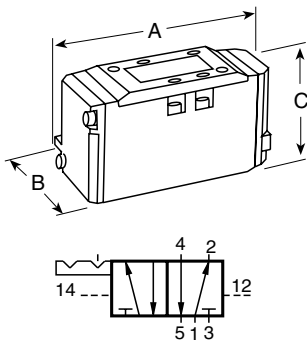
5/2 Valves – Single Pressure Controlled, Spring Return



ISO Size	Port Size	Valve Model Number*	Avg. C _v	Dimensions inches (mm)			Weight lb (kg)
				A	B	C	
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)

*See pages 22-24 for accessories.

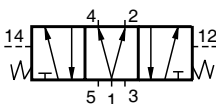
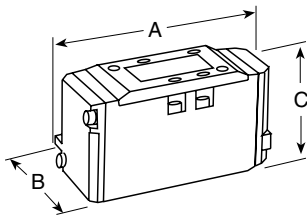
5/2 Valves – Double Pressure Controlled, Detented



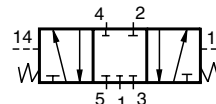
ISO Size	Port Size	Valve Model Number*	Avg. C _v	Dimensions inches (mm)			Weight lb (kg)
				A	B	C	
1	1/4 - 3/8	W6556A2417	1.0	4.8 (121)	1.6 (41)	2.7 (69)	0.8 (0.4)
2	3/8 - 1/2	W6556A3417	2.3	5.8 (148)	2.1 (52)	2.8 (71)	1.5 (0.7)
3	1/2 - 3/4	W6556A4417	3.4	7.0 (178)	2.6 (67)	3.1 (78)	3.0 (1.4)

*See pages 22-24 for accessories.

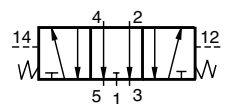
5/3 Valves – Double Pressure Controlled



Power Center



Closed Center



Open Center

ISO Size	Port Size	Valve Model Number*			Avg. C _v	Dimensions inches (mm)			Weight lb (kg)
		Power Center	Closed Center	Open Center		A	B	C	
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)

* See pages 22-24 for 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

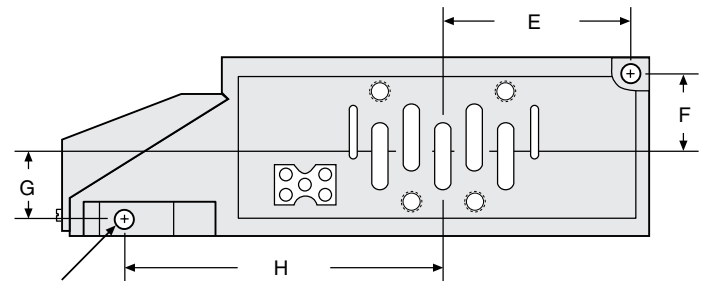
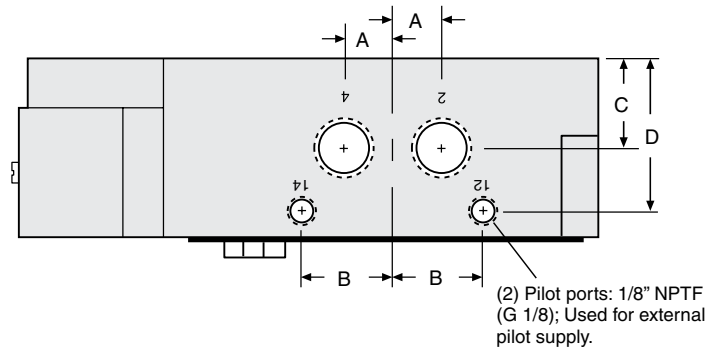
Please read carefully and thoroughly all of the **CAUTIONS** on the inside back cover.



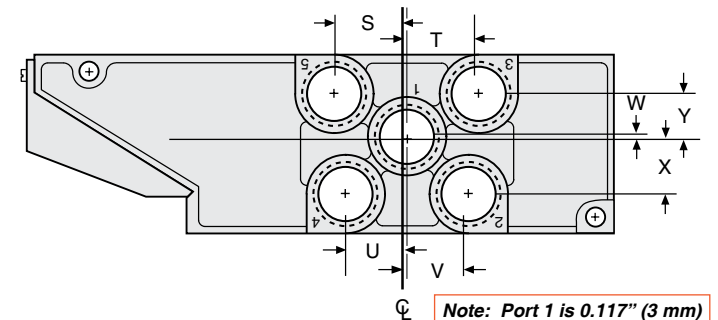
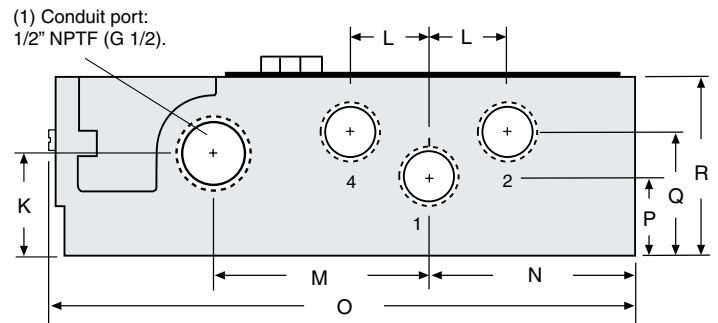
Bases for Series W65 ISO Valves (5599/II)

Side and Bottom-Ported Bases

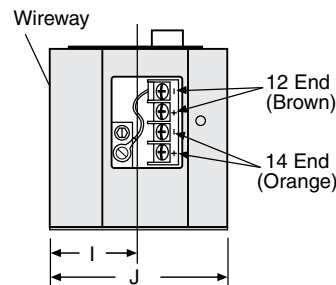
ISO Size	Port Size	Base Station Model Number
ISO 1	1/4 NPTF Side	949N91
	1/4 NPTF Side/Bottom	971N91
	3/8 NPTF Side	950N91
	3/8 NPTF Side/Bottom	972N91
	G 1/4 Side	D949N91
	G 3/8 Side	D950N91
ISO 2	3/8 NPTF Side	951N91
	3/8 NPTF Side/Bottom	952N91
	1/2 NPTF Side	953N91
	1/2 NPTF Side/Bottom	954N91
	G 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
	G 1/2 Side/Bottom	D956N91
	G 3/4 Side	D957N91
	G 3/4 Side/Bottom	D958N91



(2) Mounting holes:
ISO 1 - 0.21 (5.3) diameter.
ISO 2, 3 - 0.25 (6.4) diameter.



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



Assembled manifolds also available. Consult ROSS.

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)

Manifolds for Series W65 ISO Valves (5599/II)

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.

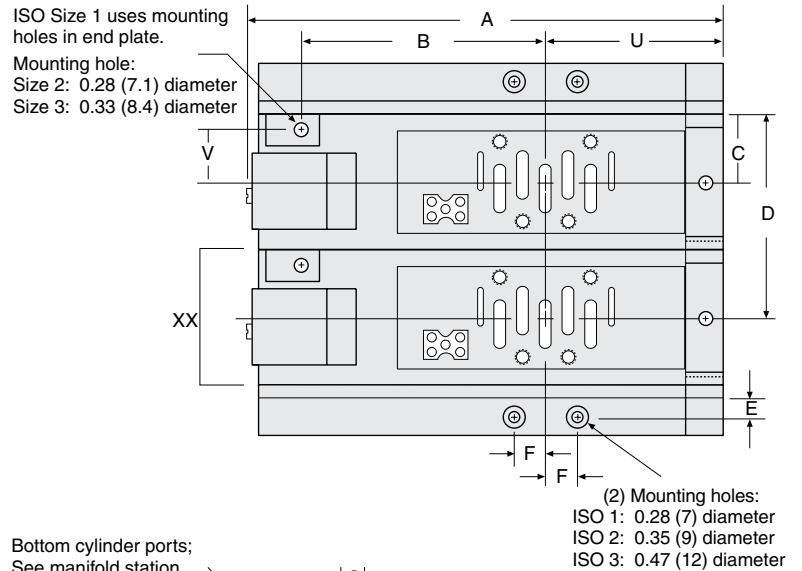
**NPT port threads. For BSPP threads, add a "D" prefix to the model number, e.g. D493N86.

Manifold Station Assembly Numbers*

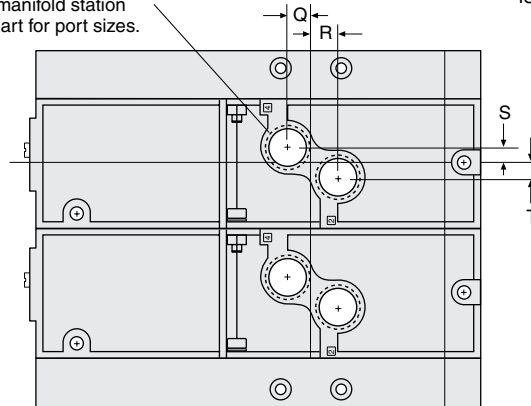
Series	Port Size	Part Number**
ISO 1	1/4" NPTF End/Bottom	959N91
	3/8" NPTF End/Bottom	960N91
ISO 2	3/8" NPTF End/Bottom	961N91
	1/2" NPTF End/Bottom	962N91
ISO 3	1/2" NPTF End/Bottom	963N91
	3/4" NPTF End/Bottom	964N91

*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.

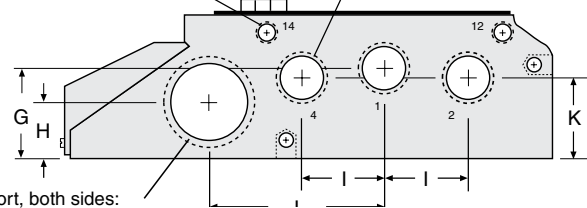


Bottom cylinder ports; See manifold station kit chart for port sizes.

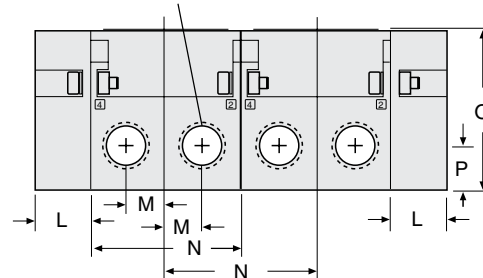


(2) Pilot ports: 1/8" NPTF (G 1/8); Used for external pilot supply.

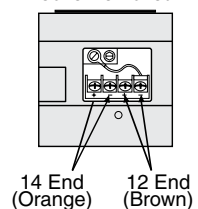
(3) Side ports, both sides; See end plate kit chart for port sizes.



(2) Side cylinder ports: See manifold block kit chart for port sizes



View XX with conduit cover removed

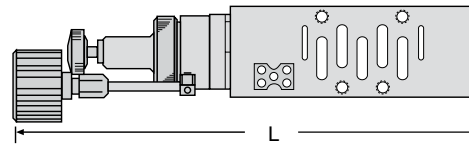


Accessories for Series 65 ISO Valves (5599/II)

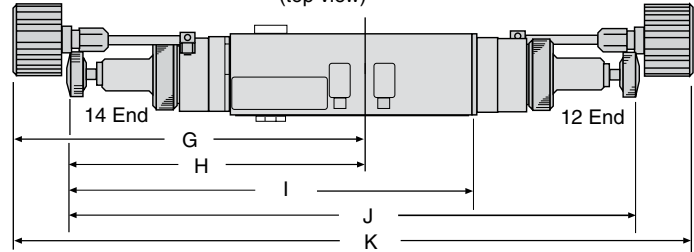
Interposed Regulators

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)

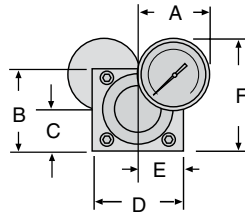


Double Interposed Regulator
(top view)



WARNING

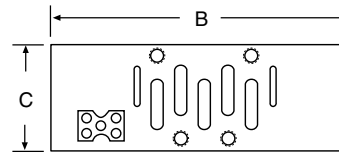
Double interposed regulators will reverse output ports - the 12 solenoid will pressurize the 4 port, the 14 solenoid will pressurize the 2 port - which may cause unexpected, potentially dangerous cylinder movement at valve pressurization.



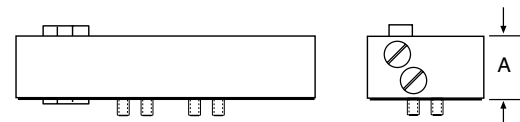
ISO Size	Part Number	A	B	C	D	E	F	G	H	I	J	K	L
1 (Sgl.)	965N91	1.6 (39)	1.8 (45)	0.9 (23)	1.7 (43)	0.9 (22)	2.5 (63)	6.2 (157)	7.2 (182)	8.0 (204)	11.6 (295)	13.6 (345)	9.0 (229)
1 (Dbl.)	966N91	1.6 (39)	1.8 (45)	0.9 (23)	1.7 (43)	0.9 (22)	2.5 (63)	6.2 (157)	7.2 (182)	8.0 (204)	11.6 (295)	13.6 (345)	9.0 (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	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)

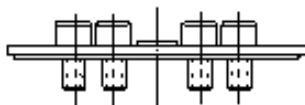


Transition Plates

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

ISO Size	Part Number
1	1381N77
2	1382N77
3	1383N77

Blank Station Kits

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



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

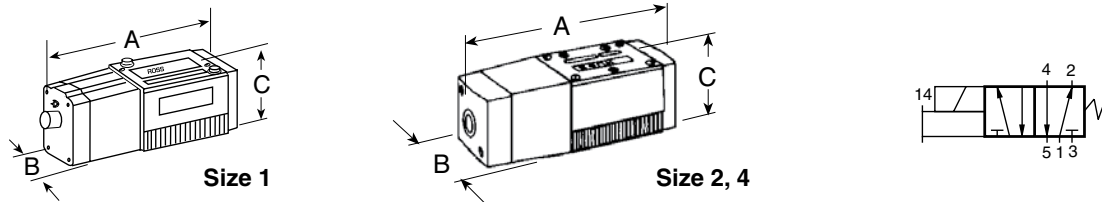
A blocking disk closes the ports between manifold stations.



ISO Size	Part Number
1	1376N77
2	1378N77
3	1380N77

Series W70 Spool & Sleeve Valves for ANSI Bases

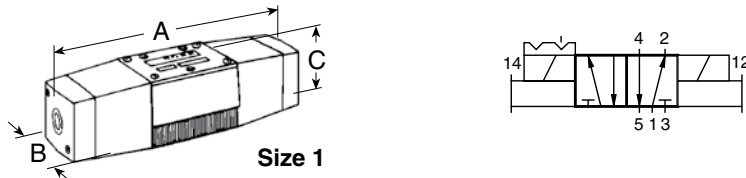
5/2 Valves – Single Direct Solenoid, Spring Return



ANSI Size	Range of Port Sizes	Valve Model Number*	Avg. C_v	Dimensions inches (mm)			Weight lb (kg)
				A	B	C	
1	1/4 - 3/8	W7016A2331	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)

* Base not included. See pages 30-31 for accessories.

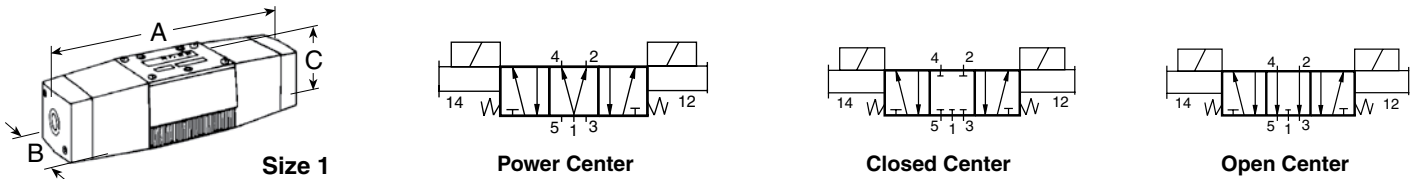
5/2 Valves – Double Direct Solenoid, Detented



ANSI Size	Range of Port Sizes	Valve Model Number*	Avg. C_v	Dimensions inches (mm)			Weight lb (kg)
				A	B	C	
1	1/4 - 3/8	W7016A2332	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)

* Base not included. See pages 30-31 for accessories.

5/3 Valves – Double Direct Solenoid



ANSI Size	Range of Port Sizes	Valve Model Number*			Avg. C_v	Dimensions inches (mm)			Weight lb (kg)
		Power Center	Closed Center	Open Center		A	B	C	
1	1/8 - 3/8	W7017A2905	W7017A2331	W7017A2332	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)

* See pages 30-31 for accessories.

STANDARD SPECIFICATIONS: For valves on this page.

Solenoids: AC power; DC for size 1 models only.

Standard Voltages: See page 110; consult ROSS.

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.

Indicator Light: Available.

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).

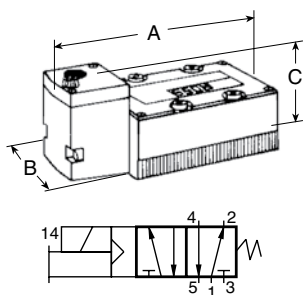
IMPORTANT NOTE

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



Series W70 Spool & Sleeve Valves for ANSI Bases

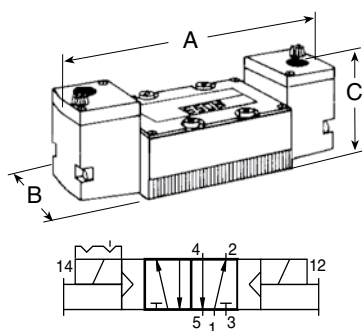
5/2 Valves – Single Solenoid Pilot Controlled, Spring Return



ANSI Size	Range of Port Sizes	Valve Model Number*	Avg. C _v	Dimensions inches (mm)			Weight lb (kg)
				A	B	C	
1	1/4 - 3/8	W7076A2331	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 - 1 1/4	W7076C6331	10	9.8 (249)	3.9 (99)	4.0 (101)	7.3 (3.3)
20	1 1/4 - 1 1/2	W7076C8331	22	15 (381)	5.6 (142)	4.1 (104)	14.5 (6.5)

* Base not included. See pages 30-31 for accessories.

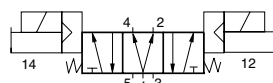
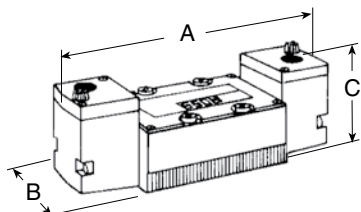
5/2 Valves – Double Solenoid Pilot Controlled, Detented



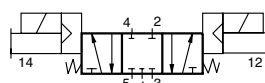
ANSI Size	Range of Port Sizes	Valve Model Number*	Avg. C _v	Dimensions inches (mm)			Weight lb (kg)
				A	B	C	
1	1/4 - 3/8	W7076A2332	1.0	7.7 (194)	2.0 (50)	2.4 (59)	4.0 (1.8)
2.5	3/8 - 1/2	W7076A3332	2.5	8.8 (224)	2.7 (67)	3.6 (91)	4.0 (1.8)
4	3/8 - 3/4	W7076D4332	4.2	9.8 (249)	3.5 (88)	4.0 (101)	6.5 (2.9)
10	3/4 - 1 1/4	W7076C6332	10	11.3 (286)	3.9 (99)	4.0 (101)	9.0 (4.1)
20	1 1/4 - 1 1/2	W7076C8332	22	16.5 (417)	5.6 (142)	4.1 (104)	15.8 (6.8)

* Base not included. See pages 30-31 for accessories.

5/3 Valves – Double Solenoid Pilot Controlled



Power Center



Closed Center



Open Center

ANSI Size	Range of Port Sizes	Valve Model Number*			Avg. C _v	Dimensions inches (mm)			Weight lb (kg)
		Power Center	Closed Center	Open Center		A	B	C	
1	1/4 - 3/8	W7077A2906	W7077A2331	W7077A2332	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 - 1 1/4	W7077A6920	W7077C6331	W7077C6332	10	12.1 (307)	3.9 (99)	4.0 (101)	8.5 (3.8)
20	1 1/4 - 1 1/2	W7077A8901	W7077C8331	W7077C8332	22	16.5 (417)	5.6 (142)	4.1 (104)	15.3 (6.9)

* See pages 30-31 for accessories.

STANDARD SPECIFICATIONS: For valves on this page.

Solenoids: AC or DC power.

Standard Voltages: See page 110; 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).

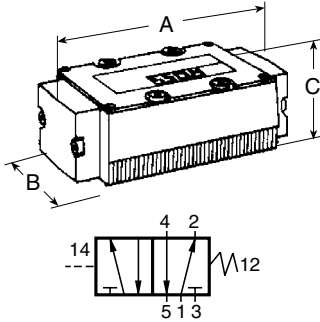
Size 2.5, 4 & 10 models: At least 15 psig (1 bar).

IMPORTANT NOTE

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

Series W70 Spool & Sleeve Valves for ANSI Bases

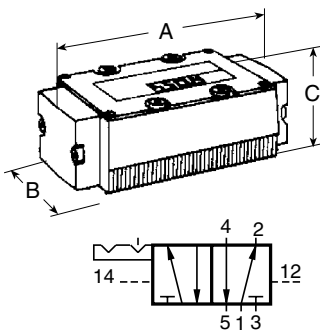
5/2 Valves – Single Pressure Controlled, Spring Return



ANSI Size	Range of Port Sizes	Valve Model Number*	Avg. C _v	Dimensions inches (mm)			Weight lb (kg)
				A	B	C	
1	1/4 - 3/8	W7056A2331	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)

* Base not included. See pages 30-31 for accessories.

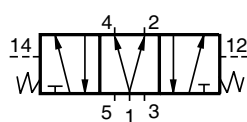
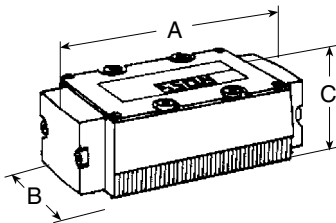
5/2 Valves – Double Pressure Controlled, Detented



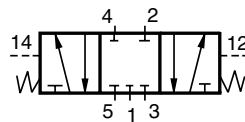
ANSI Size	Range of Port Sizes	Valve Model Number*	Avg. C _v	Dimensions inches (mm)			Weight lb (kg)
				A	B	C	
1	1/4 - 3/8	W7056A2332	1.0	5.1(128)	2.0 (50)	2.3 (58)	2.5 (1.1)
2.5	3/8 - 1/2	W7056A3332	2.5	5.7 (145)	2.6 (66)	2.6 (66)	2.0 (0.9)
4	3/8 - 3/4	W7056B4332	4.2	6.9 (174)	3.5 (88)	2.8 (70)	4.3 (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)

* Base not included. See pages 30-31 for accessories.

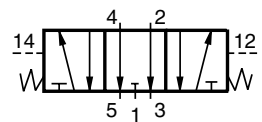
5/3 Valves – Double Pressure Controlled



Power Center



Closed Center



Open Center

ANSI Size	Range of Port Sizes	Valve Model Number*			Avg. C _v	Dimensions inches (mm)			Weight lb (kg)
		Power Center	Closed Center	Open Center		A	B	C	
1	1/8 - 3/8	–	W7057A2331	W7057A2332	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)

* Base not included. See pages 30-31 for 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).

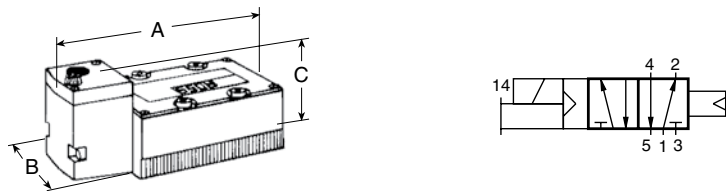
IMPORTANT NOTE

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



Series W74 Poppet Valves for ANSI Bases

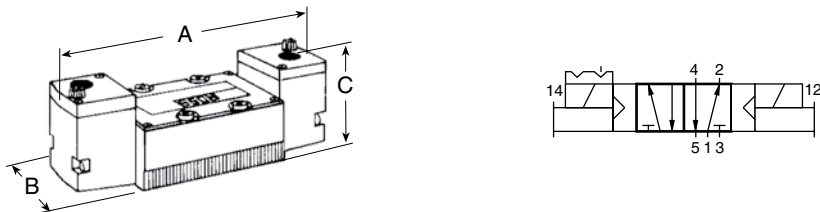
5/2 Valves – Single Solenoid Pilot Controlled, Air Return



ANSI Size	Range of Port Sizes	Valve Model Number*		Avg. C_v	Dimensions inches (mm)			Weight lb (kg)
		Std. Temp.	High Temp.		A	B	C	
1	1/4 - 3/8	W7476A2331	W7476A2336	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 - 1 1/4	W7476A6331	W7476A6336	11	9.8 (249)	3.9 (99)	4.0 (101)	6.1 (2.8)
20	1 1/4 - 1 1/2	W7476A8331	W7476A8336	22	15.0 (381)	5.6 (142)	4.1 (104)	18.5 (8.3)

* Base not included. See pages 30-31 for accessories.

5/2 Valves – Double Solenoid Pilot Controlled, Detented



ANSI Size	Range of Port Sizes	Valve Model Number*		Avg. C_v	Dimensions inches (mm)			Weight lb (kg)
		Std. Temp.	High Temp.		A	B	C	
1	1/4 - 3/8	W7476A2332	W7476A2337	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 - 1 1/4	W7476A6332	W7476A6337	11	11.3 (286)	3.9 (99)	4.0 (101)	10.8 (4.9)
20	1 1/4 - 1 1/2	W7476A8332	W7476A8337	22	16.5 (417)	5.6 (142)	4.1 (104)	19.8 (8.9)

* Base not included. See pages 30-31 for accessories.

STANDARD SPECIFICATIONS: For valves on this page.

Solenoids: AC or DC power.

Standard Voltages: See page 110; 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° 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.

Flow Media: Filtered air; 5 micron recommended.

Inlet Pressure: 30 to 150 psig (2 to 10 bar).

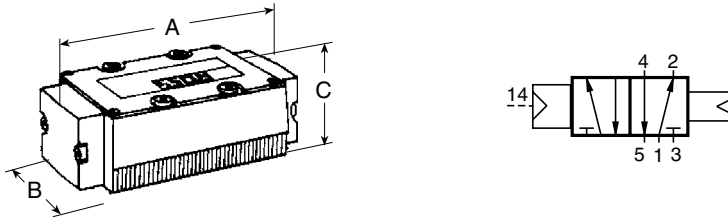
Pilot Pressure: Must be equal to or greater than inlet pressure.

IMPORTANT NOTE

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

Series W74 Poppet Valves for ANSI Bases

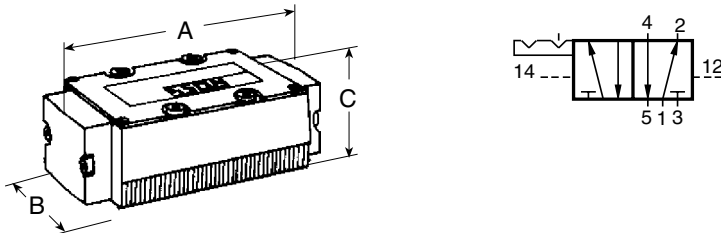
5/2 Valves – Single Pressure Controlled, Air Return



ANSI Size	Range of Port Sizes	Valve Model Number*		Avg. C _v	Dimensions inches (mm)			Weight lb (kg)
		Std. Temp.	High Temp.		A	B	C	
1	1/4 - 3/8	W7456A2331	W7456A2336	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)

* Base not included. See pages 30-31 for accessories.

5/2 Valves – Double Pressure Controlled, Detented



ANSI Size	Range of Port Sizes	Valve Model Number*		Avg. C _v	Dimensions inches (mm)			Weight lb (kg)
		Std. Temp.	High Temp.		A	B	C	
1	1/4 - 3/8	W7456A2332	W7456A2337	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)

* Base not included. See pages 30-31 for accessories.

STANDARD SPECIFICATIONS: For valves on this page.

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

Flow Media: Filtered air; 5 micron recommended.

Inlet Pressure: 30 to 150 psig (2 to 10 bar).

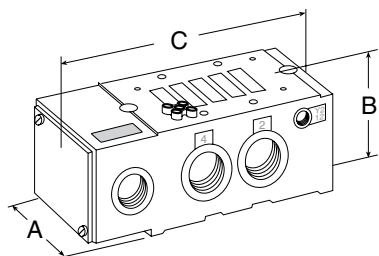
Pilot Pressure: Must be equal to or greater than inlet pressure.

IMPORTANT NOTE

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



Sub-Bases for Series W70 & W74 ANSI Valves



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-BASES

Type of Sub-Base	Outlet Port	Indicator Lights in Base*			Avg. C_v	Dimensions inches (mm)		
		None	One	Two		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)
	1 1/4	366B91	—	—	10 to 11	5.1 (130)	3.8 (96)	10.5 (266)
	1 1/4	367B91	—	—	22	6.4 (163)	3.7 (94)	12.4 (314)
	1 1/2	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)
	1 1/4	374B91	—	—	10 to 11	5.1 (130)	3.9 (99)	10.5 (266)
	1 1/4	375B91	—	—	22	6.4 (163)	3.8 (98)	12.4 (314)
	1 1/2	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.

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

VALVE MODEL NUMBERS

With locking manual override..... **W1413A1408**

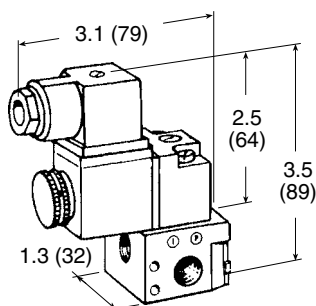
With non-locking manual override **W1413A1409**

Valve is shown with electrical connector and on a base. See page 19 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:

C_v Rating: 0.1.

Solenoids: AC or DC power.

Standard Voltages: See page 110; 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; 5 micron recommended.

Inlet Pressure: Vacuum to 150 psig (10 bar).

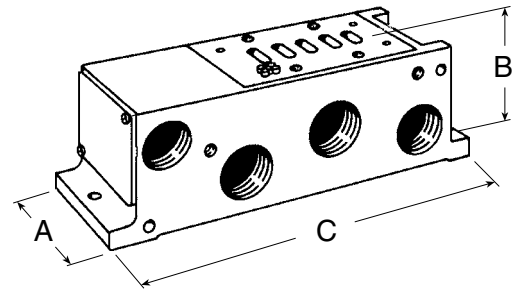
Manifolds for Series W70 & W74 ANSI Valves

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*			Avg. C _v	Dimensions inches (mm)		
		None	One**	Two**		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	360K91	—	—	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.



Accessories for Series W70 & W74 ANSI Valves

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 *	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.



Manual Override Kits for Solenoid Pilot Controlled Valves

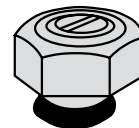
Flush flexible manual overrides are standard on solenoid pilot controlled valves with C_v ratings of 2.0 or larger. Both locking and non-locking metal override buttons are also available for these models.

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.

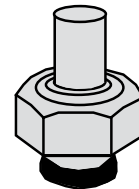
FLUSH BUTTON

Locking type Kit 792K87
Non-locking type..... Kit 790K87



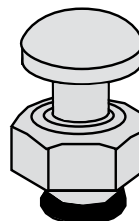
EXTENDED BUTTON

Non-locking type.....Kit 791K87



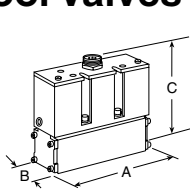
EXTENDED BUTTON WITH PALM ACTUATOR

Non-locking type.....Kit 984H87

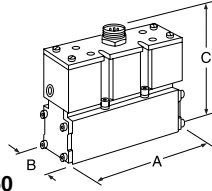


Series 80 Spool & Sleeve Valves for SAE Bases

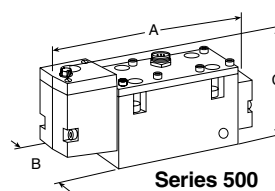
5/2 Spool Valves



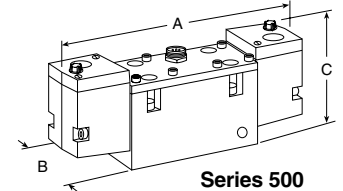
Series 125
Single or Double Solenoid



Series 250
Single or Double Solenoid



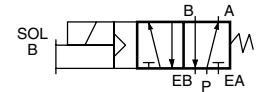
Series 500
Single Solenoid



Series 500
Double Solenoid

Valve Model Numbers (Base not included)

SAE Series	Type of Wiring			Avg. C_v	Dimensions inches (mm)			Weight lb (kg)
	Ford	Chrysler	Hardwire		A	B	C	
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)



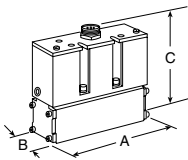
Single Solenoid



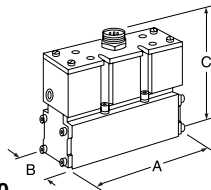
Double Solenoid

*Bases and manifolds on pages 35-36.

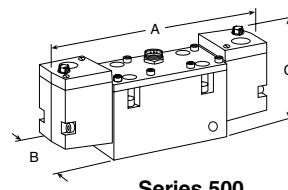
5/3 Spool Valves



Series 125
Double Solenoid



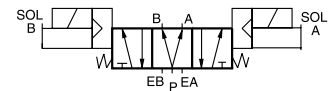
Series 250
Double Solenoid



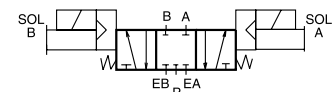
Series 500
Double Solenoid

Valve Model Numbers (Base not included)

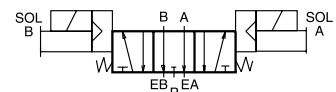
SAE Series	Type of Wiring			Avg. C_v	Dimensions inches (mm)			Weight lb (kg)
	Ford	Chrysler	Hardwire		A	B	C	
Power Center Solenoid Pilot Valves								
125	8077C3910	8077C3904	—	1.4	5.5 (140)	1.8 (45)	5.1 (129)	3.5 (1.6)
250	8077C4907	8077C4904	—	4.0	7.3 (185)	2.6 (65)	5.6 (142)	6.5 (2.9)
Open Center 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)



Power Center



Closed Center



Open Center

*Bases and manifolds on pages 35-36.

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; 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.

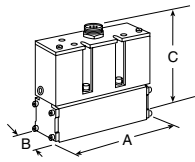
IMPORTANT NOTE

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

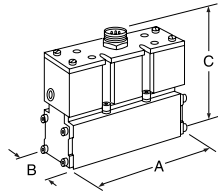


Series 84 Poppet Valves for SAE Bases

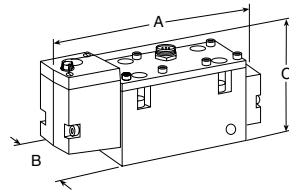
Series 84 Poppet Valves



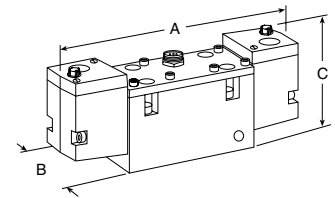
Series 125
Single or Double Solenoid



Series 250
Single or Double Solenoid



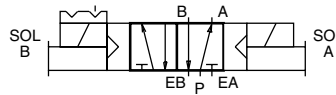
Series 500
Single Solenoid



Series 500
Double Solenoid



Single Solenoid



Double Solenoid

Valve Model Numbers (Base not included)

SAE Series	Type of Wiring			Avg. C_v	Dimensions inches (mm)			Weight lb (kg)
	Ford	Chrysler	Hardwire		A	B	C	
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)

* Bases and manifolds on pages 35-36. 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; 5 micron recommended.

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.

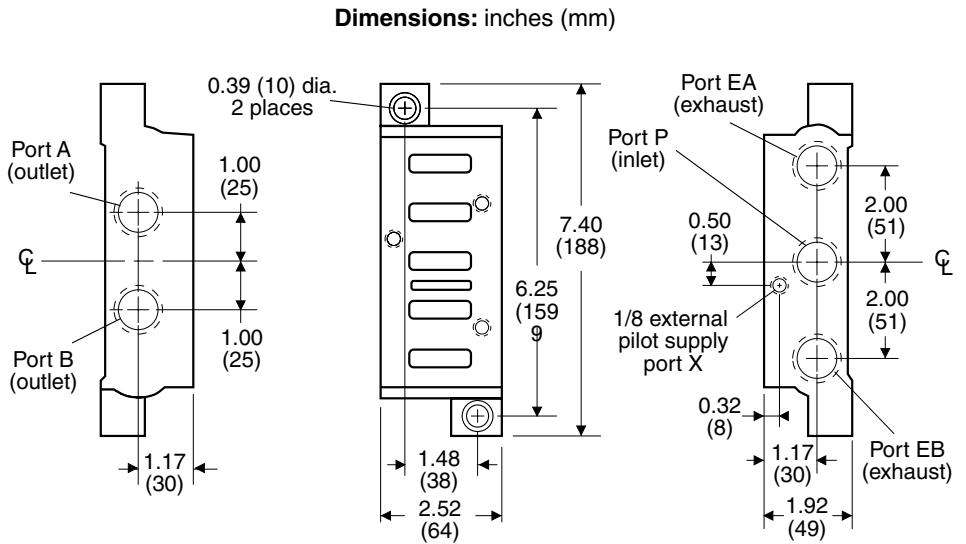
Sub-Bases for Series 80 & 84 SAE Valves

Side-Ported

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

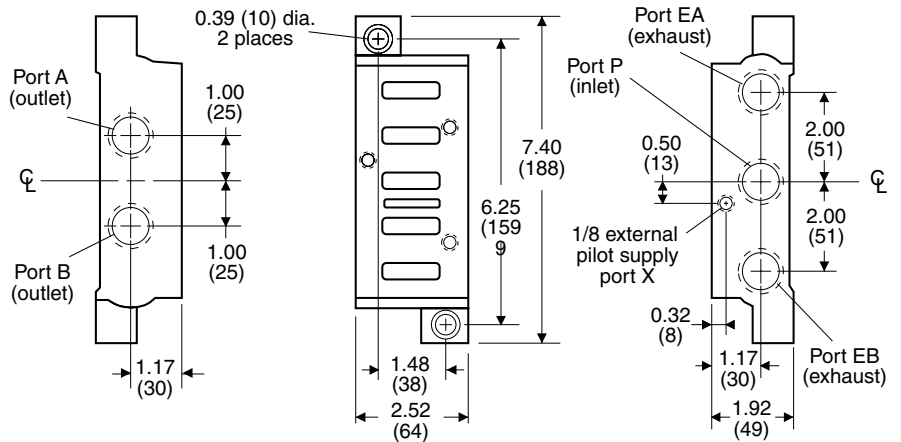
*NPT threads. For SAE threads, consult ROSS.



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

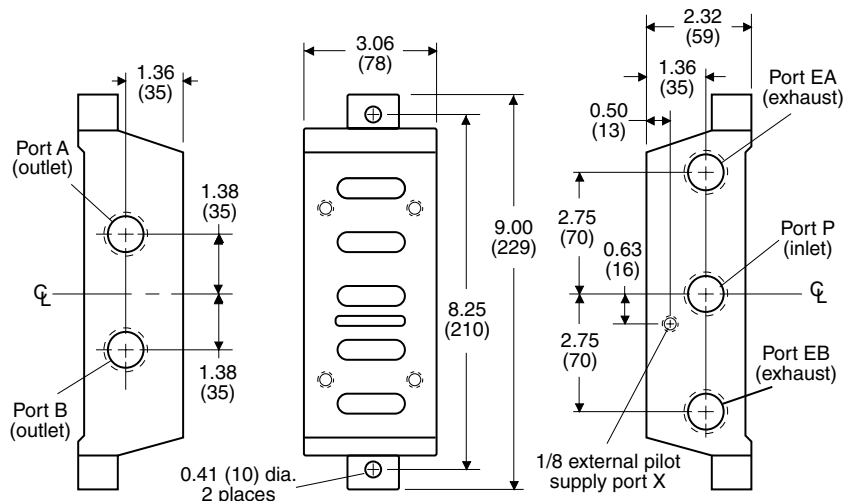
*NPT threads. For SAE threads, consult ROSS.



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 Series 80 & 84 SAE Valves

Series 125 Manifold Stations

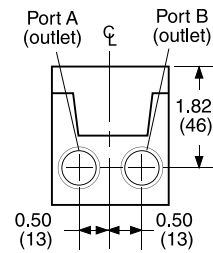
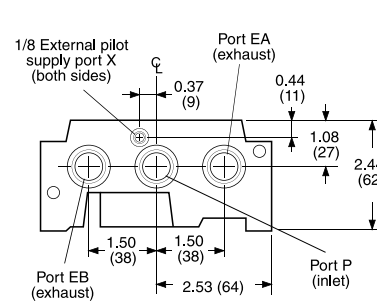
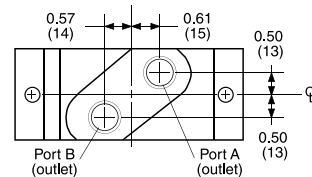
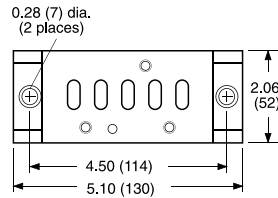
Dimensions: inches (mm)

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**.



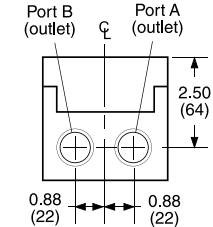
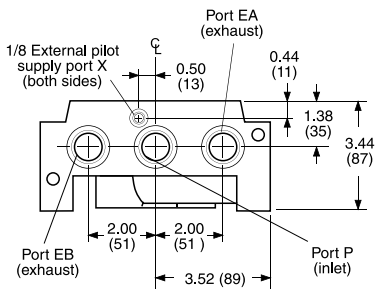
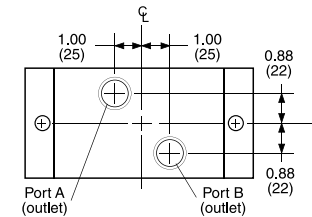
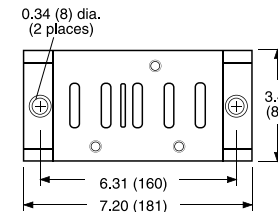
Series 250 Manifold Stations

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**.



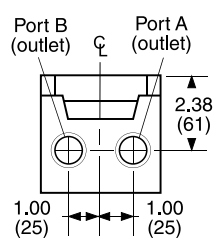
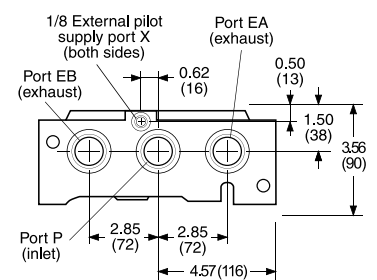
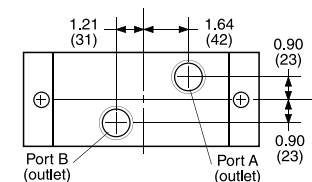
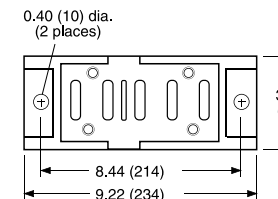
Series 500 Manifold Stations

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).

Series 27 Poppet Valves for Line Mounting

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.

FEATURES:

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

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

Timed Sequence 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. For longer delays see “Q” adaptor below.

“PB” Adaptor: Increases the actuating force on the valve piston. Useful with low pilot pressure.

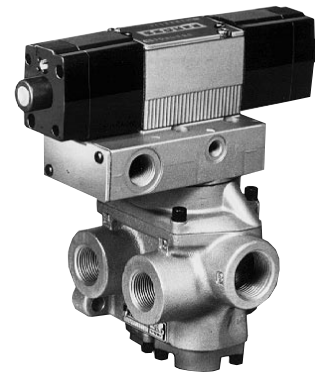
Air Index Adaptor: Allows a single control valve to function as an impulse controlled, detented valve. Successive momentary signals from the same source actuate and de-actuate the valve.

“Q” Adaptor: For use in conjunction with the timed sequence adaptor to extend the delay interval up to 60 seconds. The “Q” adaptor also provides quicker response to actuating and de-actuating signals.

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

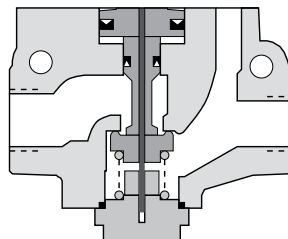


3/2 Valve with Single Solenoid Pilot Control

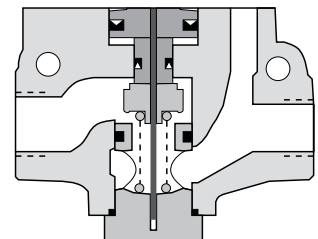


4/2 Valve with Double Solenoid Pilot Control

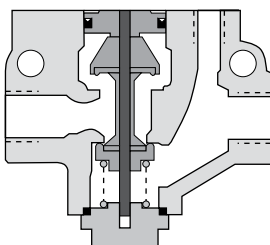
Series 27 Valve Bodies



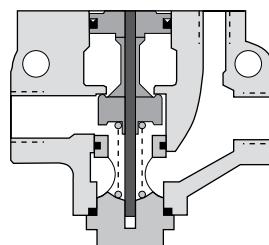
2/2 Normally Closed



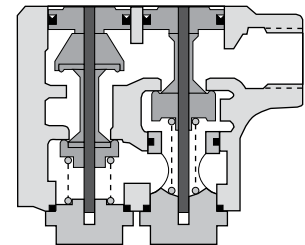
2/2 Normally Open



3/2 Normally Closed



3/2 Normally Open

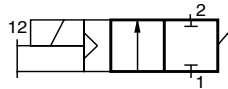


4/2

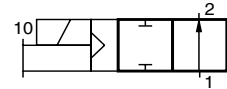
Series 27 Poppet Valves for Line Mounting

Single Solenoid Pilot Controlled

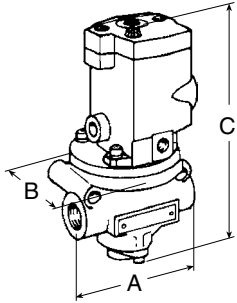
2/2 Valves



Normally Closed (NC)

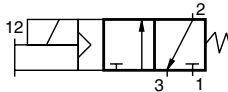


Normally Open (NO)

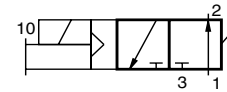


Port Size	Valve Model Number		Avg. C_v		Dimensions inches (mm)			Weight lb (kg)
	NC	NO	NC	NO	A	B	C	
1/4	2771B2001	2772B2001	2.3	2.3	3.6 (91)	3.2 (79)	6.9 (175)	2.5 (1.2)
3/8	2771B3001	2772B3001	3.8	3.3	3.6 (91)	3.2 (79)	6.9 (175)	2.5 (1.2)
1/2	2771B4011	2772B4011	4.0	3.5	3.6 (91)	3.2 (79)	6.9 (175)	2.5 (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)

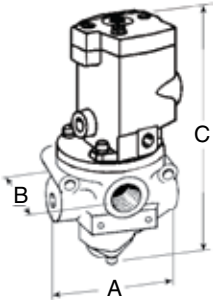
3/2 Valves



Normally Closed (NC)

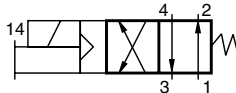
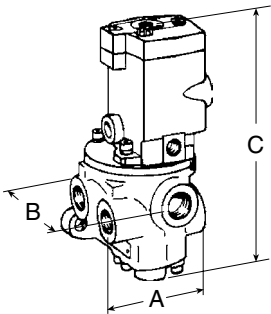


Normally Open (NO)



Port Sizes		Valve Model Number		Avg. C_v		Dimensions inches (mm)			Weight lb (kg)
In-Out	Exh.	NC	NO	NC	NO	A	B	C	
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		Valve Model Number	Avg. C_v	Dimensions inches (mm)			Weight lb (kg)
In-Out	Exh.			A	B	C	
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 110; 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; 5 micron recommended.

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.

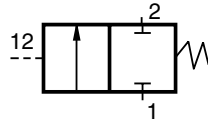
Threads: Model numbers above specify NPT pressure port threads. For other threads, see page 110.

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

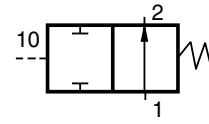
Series 27 Poppet Valves for Line Mounting

Single Pressure Controlled

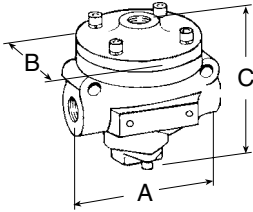
2/2 Valves



Normally Closed (NC)

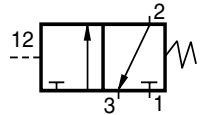


Normally Open (NO)

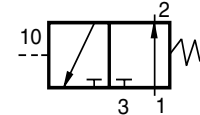


Port Size	Valve Model Number		Avg. C_v		Dimensions inches (mm)			Weight lb (kg)
	NC	NO	NC	NO	A	B	C	
1/4	2751A2001	2752A2001	2.3	2.3	3.6 (91)	3.2 (79)	3.8 (95)	1.3 (0.6)
3/8	2751A3001	2752A3001	3.8	3.3	3.6 (91)	3.2 (79)	3.8 (95)	1.3 (0.6)
1/2	2751A4011	2752A4011	4.0	3.5	3.6 (91)	3.2 (79)	3.8 (95)	1.3 (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)

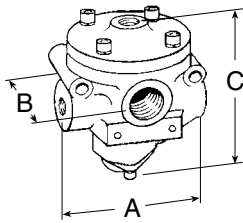
3/2 Valves



Normally Closed (NC)

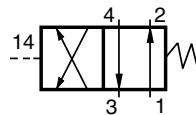
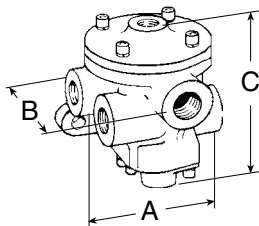


Normally Open (NO)



Port Sizes		Valve Model Number		Avg. C_v		Dimensions inches (mm)			Weight lb (kg)
In-Out	Exh.	NC	NO	NC	NO	A	B	C	
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		Valve Model Number	Avg. C_v		Dimensions inches (mm)			Weight lb (kg)
In-Out	Exh.		C_v		A	B	C	
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; 5 micron recommended.

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.

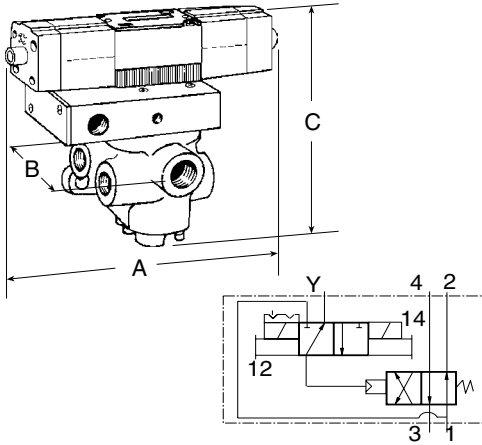
For other threads, see page 110.

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



Series 27 Poppet Valves for Line Mounting

4/2 Valves – Double Direct Solenoid Controlled, Detented



Port Sizes In-Out	Exh.	Valve Model Number	Avg. C _v	Dimensions inches (mm)			Weight lb (kg)
				A	B	C	
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 110; 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; 5 micron recommended.

Inlet Pressure: 15 to 150 psig (1 to 10 bar).

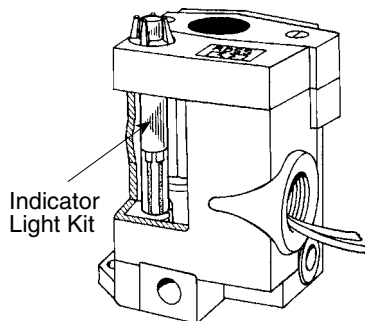
Pilot Pressure: If external supply is used, pressure must be equal to or greater than inlet pressure.

Threads: Model numbers above specify NPT pressure port threads. For other threads, see page 110.

IMPORTANT NOTE

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

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.

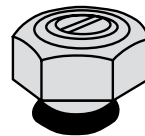
Order kit number **862K87** and specify the voltage of the solenoid.

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.

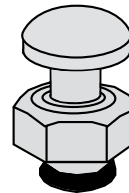
Each of the buttons in the override kits below is made of metal and is spring-returned. The locking type button, however, can be kept in the actuated position by turning the slot in the top of the button with a screwdriver.

Order by the kit numbers shown below.



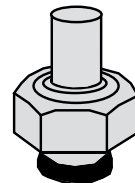
FLUSH BUTTON

Locking typeKit **792K87**
Non-locking type.....Kit **790K87**



EXTENDED BUTTON WITH PALM ACTUATOR

Non-locking type.....Kit **984H87**



EXTENDED BUTTON

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

Series 21 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.

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).

FEATURES:

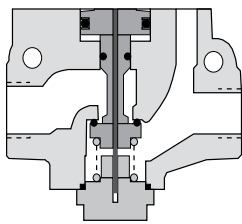
- Poppet construction for near zero leakage & high dirt tolerance
- Self-cleaning
- Wear compensating
- Repeatability throughout the life of the valve.



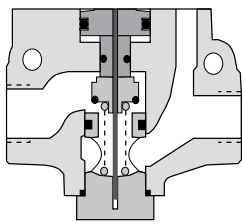
3/2 Valve with Single Solenoid Pilot
Metal override button on top of pilot is standard on all single solenoid models.

Series 21 Valve Bodies

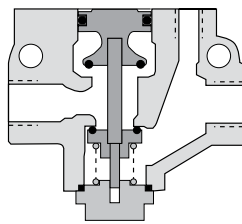
O-ring piston seals have Teflon wear rings top and bottom. Inlet and exhaust poppets have spun-in O-ring seals.



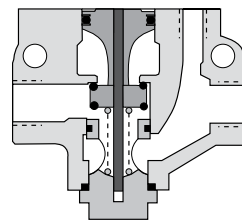
2/2 Normally Closed



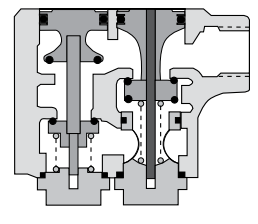
2/2 Normally Open



3/2 Normally Closed



3/2 Normally Open



4/2

STANDARD SPECIFICATIONS: For valves on page 42.

Solenoids: AC or DC power.

Standard Voltages: See page 110; 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; 5 micron recommended.

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 110.

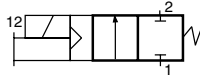
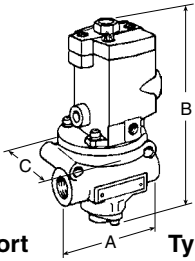
Manual Override: Non-locking metal button.



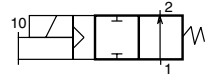
Series 21 Poppet Valves for Line Mounting

Single Solenoid Pilot Controlled

2/2 Valves



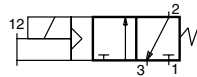
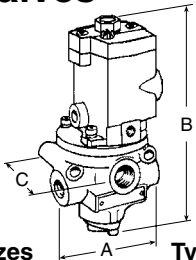
2/2 Normally Closed (NC)



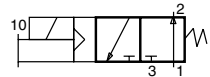
2/2 Normally Open (NO)

Port Size	Valve Model Number				Avg. C _v		Dimensions inches (mm)			Weight lb (kg)
	Type H NC	Type H NO	Type O NC	Type O NO	NC	NO	A	B	C	
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



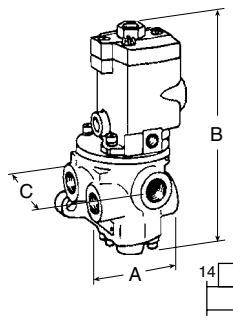
3/2 Normally Closed (NC)



3/2 Normally Open (NO)

Port Sizes In-Out Exh.		Valve Model Number				Avg. C _v		Dimensions inches (mm)			Weight lb (kg)
		Type H NC	Type H NO	Type O NC	Type O NO	NC	NO	A	B	C	
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)			Weight lb (kg)
		Number			A	B	C	
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)

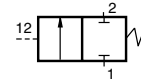
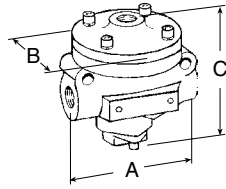
IMPORTANT NOTE Please read carefully and thoroughly all of the **CAUTIONS** on the inside back cover.

STANDARD SPECIFICATIONS: See page 41.

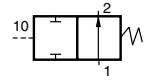
Series 21 Poppet Valves for Line Mounting

Single Pressure Controlled

2/2 Valves



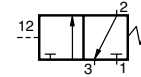
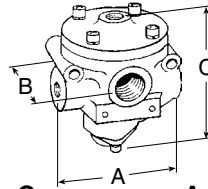
2/2 Normally Closed (NC)



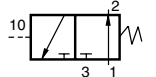
2/2 Normally Open (NO)

Port Size	Valve Model Number				Avg. C _v		Dimensions inches (mm)			Weight lb (kg)
	Type H NC	Type H NO	Type O NC	Type O NO	NC	NO	A	B	C	
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)
1 1/4	2151B7001	2152B7001	2151B7002	2152B7002	29	20	6.6 (168)	7.5 (190)	4.1 (104)	11.0 (5.0)
1 1/2	2151B8011	2152B8011	2151B8012	2152B8012	29	21	6.6 (168)	7.5 (190)	4.1 (104)	11.0 (5.0)

3/2 Valves



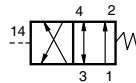
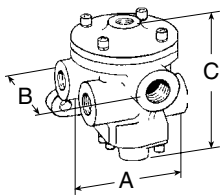
3/2 Normally Closed (NC)



3/2 Normally Open (NO)

Port Sizes In-Out Exh.		Valve Model Number				Avg. C _v		Dimensions inches (mm)			Weight lb (kg)
		Type H NC	Type H NO	Type O NC	Type O NO	NC	NO	A	B	C	
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	1 1/2	2153B6001	2154B6001	2153B6002	2154B6002	29	21	6.6 (168)	7.5 (190)	4.8 (123)	11.0 (5.0)
1 1/4	1 1/2	2153B7001	2154B7001	2153B7002	2154B7002	31	22	6.6 (168)	7.5 (190)	4.8 (123)	11.0 (5.0)
1 1/2	1 1/2	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)			Weight lb (kg)
		Number			A	B	C	
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	1 1/2	2156B6001	2156B6002	23	8.2 (208)	11.1 (282)	6.5 (165)	12.0 (5.4)
1 1/4	1 1/2	2156B7001	2156B7002	24	8.2 (208)	11.1 (282)	6.5 (165)	12.0 (5.4)
1 1/2	1 1/2	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; 5 micron recommended.

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 110.

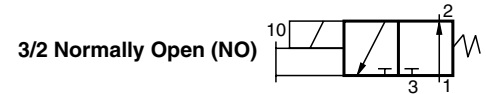
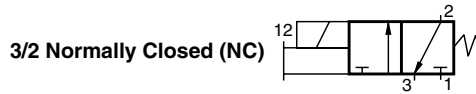
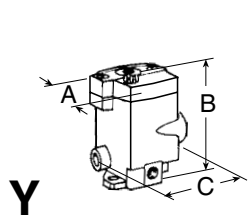
IMPORTANT NOTE Please read carefully and thoroughly all of the **CAUTIONS** on the inside back cover.



Series 16 Compact Valves

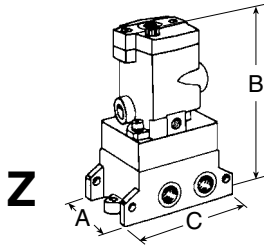
Poppet Construction, Line or Manifold Mounting

3/2 Valves – Single Direct Solenoid



For Line Mounting

Port Size	Valve Type	Valve Model Numbers		Avg. C _v	Dimensions inches (mm)			Weight lb (kg)
		NC	NO		A	B	C	
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)

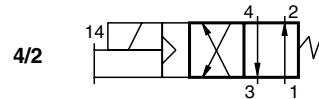
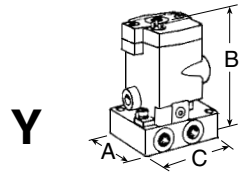


For Manifold Mounting

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

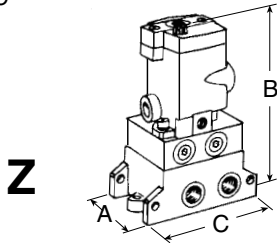
*Also order manifold **256B91** (not included with this valve).

4/2 Valves – Single Solenoid Pilot Controlled



For Line Mounting

Port Size	Valve Type	Valve Model Number	Avg. C _v	Dimensions inches (mm)			Weight lb (kg)
				A	B	C	
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)			Weight lb (kg)
				A	B	C	
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 110; 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; 5 micron recommended.

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:

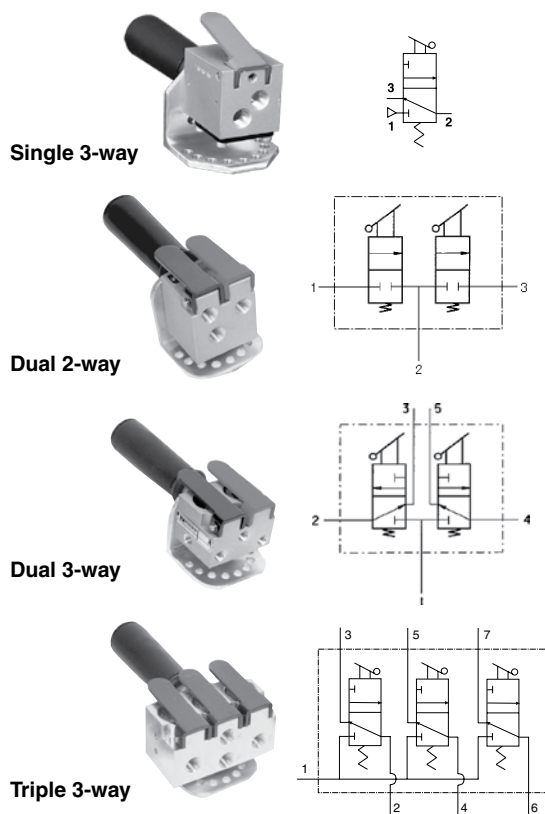
Indicator Light: Order kit number **862K87** and specify the voltage of the solenoid.

Manual Override: Metal button; see Manual Override Kits.

IMPORTANT NOTE

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

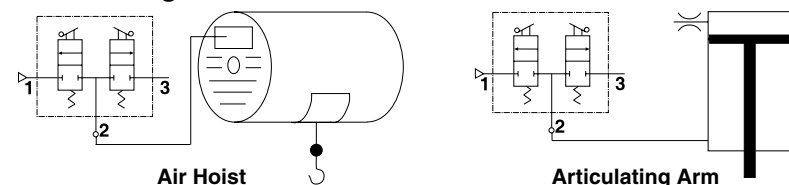
Pendant Control Valves



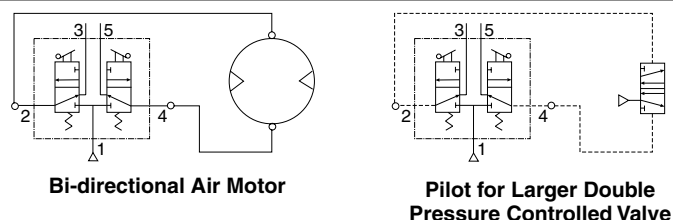
ROSS pendant control valves are a durable pneumatic solution that can be used anywhere manual control of devices is needed, such as an air hoist, air motor, or counterbalance cylinder. Ideal for use on or with material handling devices such as overhead cranes or air hoists, ROSS pendant control valves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

Application Data

Dual 2/2 - High Flow



Dual 3/2



To convert a Dual 3/2 into a Dual 2/2:

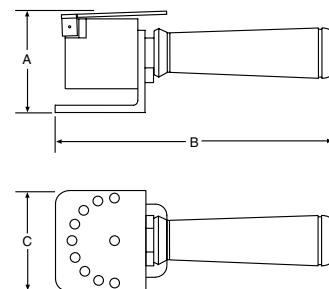
Plug ports 3 and 5. Connect supply line to port 2.
Port 1 becomes the outlet and port 4 becomes the exhaust port.

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 independent 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		Dimensions inches (mm)			Weight lb (kg)
			1-2	2-3	A	B	C	
Single 3-way; one lever, no handle	1/4"	2025A2904	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; 5 micron recommended.

Inlet Pressure: 0 to 150 psig (0 to 10 bar).

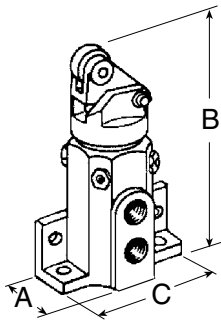
IMPORTANT NOTE

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

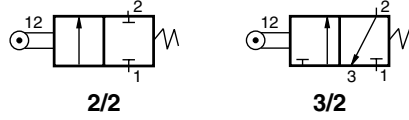


Series 11 & 12 Cam and Manual Valves

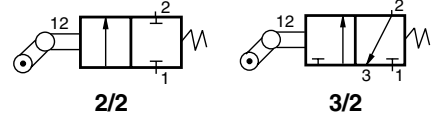
2/2 and 3/2 Cam Valves



ROLLER

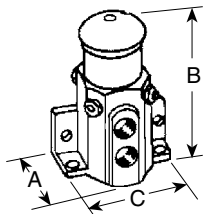


1-WAY ROLLER

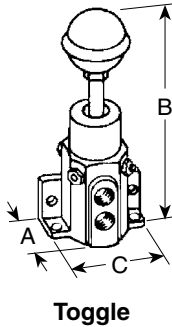


Port Size	Valve Type	Valve Model Numbers	Avg. C_v	Dimensions inches (mm)			Weight lb (kg)
				A	B	C	
1/4	2/2 - Roller	1131A2001	0.5	1.8 (46)	4.4 (111)	2.8 (70)	1.0 (0.5)
1/4	3/2 - Roller	1133A2001	0.5	1.8 (46)	4.4 (111)	2.8 (70)	1.0 (0.5)
1/4	2/2 - 1-Way Roller	1131A2002	0.5	1.8 (46)	4.5 (114)	2.8 (70)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

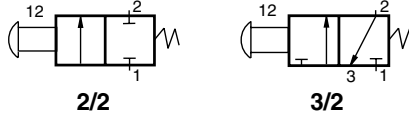


Pushbutton

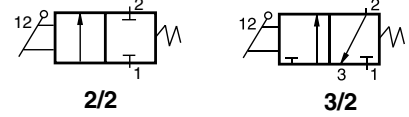


Toggle

PUSHBUTTON

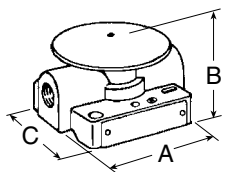


TOGGLE

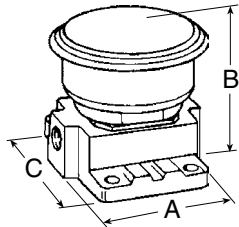


Port Size	Valve Type	Valve Model Numbers	Avg. C_v	Dimensions inches (mm)			Weight lb (kg)
				A	B	C	
1/4	2/2 - Pushbutton	1121A2001	0.5	1.8 (46)	3.3 (83)	2.8 (70)	1.0 (0.5)
1/4	3/2 - Pushbutton	1123A2001	0.5	1.8 (46)	3.3 (83)	2.8 (70)	1.0 (0.5)
1/4	2/2 - Toggle	1121A2002	0.5	1.8 (46)	5.9 (150)	2.8 (70)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

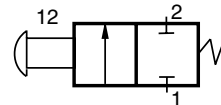
2/2 and 3/2 Pushbutton Valves



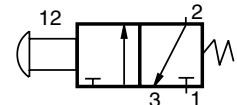
RD- Regular Duty



HD- Heavy Duty



2/2



3/2

Port Size	Valve Type	Valve Model Numbers		Avg. C_v	Dimensions inches (mm)			Weight lb (kg)
		Green Button	Red Button		A	B	C	
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)

Ring-type Guard: Helps to protect against accidental valve actuation.

Order by following part numbers:

For RD valves: 279B30

For 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; 5 micron recommended.

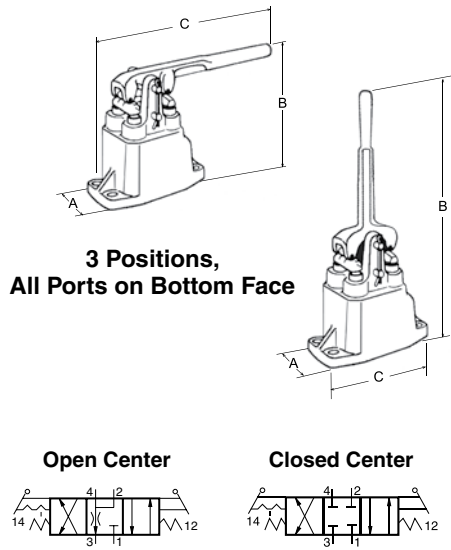
Inlet Pressure: 5 to 150 psig (0.3 to 10 bar) except Type RD; 5 to 125 psig (0.3 to 8.6 bar) on Type RD.

IMPORTANT NOTE

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

Series 31 & 36 Manual Valves

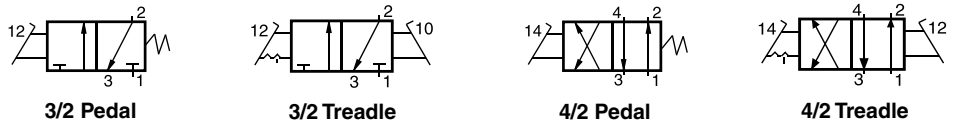
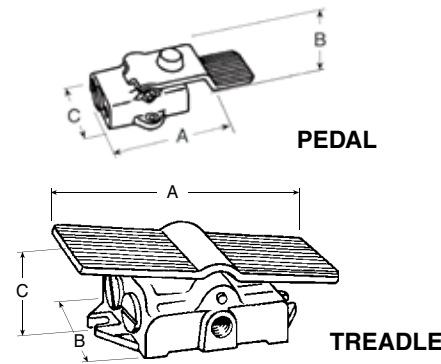
4/3 Lever Valves



Port Size	Valve Model Numbers	Avg. C_v	Closed/Open Center	Dimensions inches (mm)			Weight lb (kg)
				A	B	C	
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)
1 1/4	3126A7007	12	Open	4.8 (121)	8.2 (207)	18.8 (476)	11.0 (5.0)
1 1/4	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)

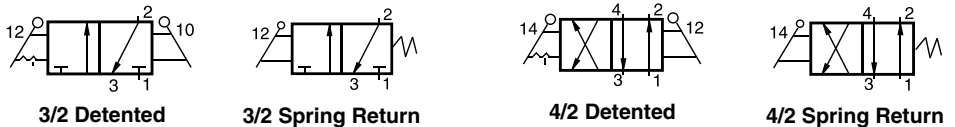
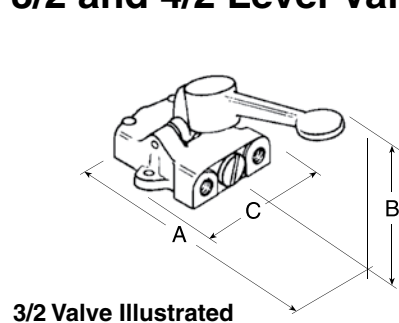
** Non-detented models.

3/2 and 4/2 Pedal and Treadle Valves



Port Size	Valve Type	Valve Model Numbers*	Avg. C_v	Dimensions inches (mm)			Weight lb (kg)
				A	B	C	
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)

3/2 and 4/2 Lever Valves



Port Size	Valve Type	Valve Model Numbers*	Avg. C_v	Dimensions inches (mm)			Weight lb (kg)
				A	B	C	
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; 5 micron recommended.
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).

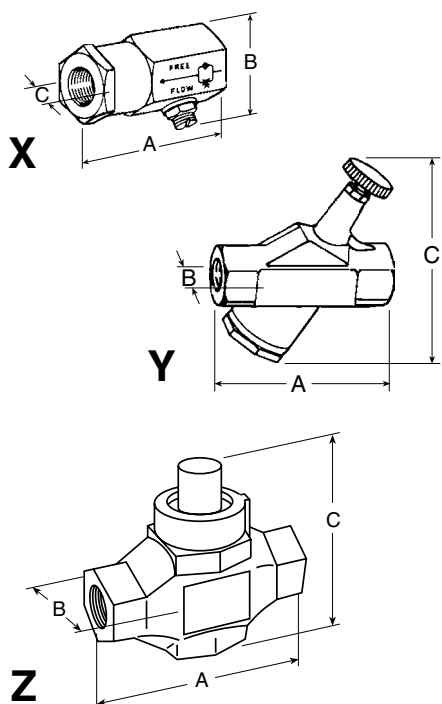
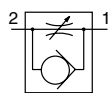
IMPORTANT NOTE
 Please read carefully and thoroughly
 all of the **CAUTIONS** on the inside back cover.



Series 19 Flow Control Valves

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.

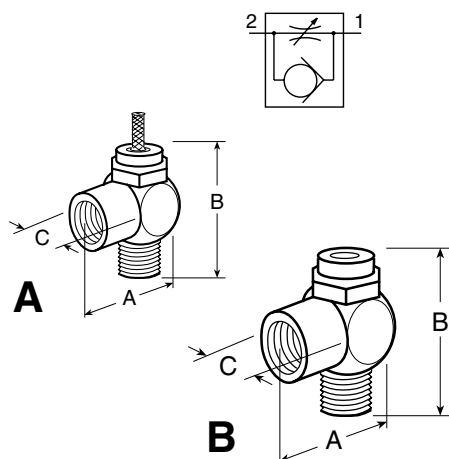


Valve Type	Port Size	Valve Model Number	Avg. C_v (Fully open)	Dimensions inches (mm)			Weight lb (kg)
				A	B	C	
X	1/8	1968D1004	0.5	2.4 (62)	1.3 (33)	1.0 (25)	0.5 (0.2)
	1/4	1968D2004	0.5	2.4 (62)	1.3 (33)	1.0 (25)	0.5 (0.2)
	3/8	1968D3014	0.5	2.4 (62)	1.3 (33)	1.0 (25)	0.5 (0.2)
Y	1/4	1968B2007	2.3	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.



Port Size	Type of Adjustment	Valve Model Number	Avg. C_v (Fully open)	Dimensions inches (mm)			Weight lb (kg)
				A	B	C	
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; 5 micron recommended.

Pressure Range: 5 to 150 psig (0.3 to 10 bar).

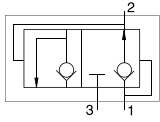
Port Threads: NPT standard, BSPP. For BSPP threads add a "D" prefix to the model number, e.g. D1968D1004.

IMPORTANT NOTE

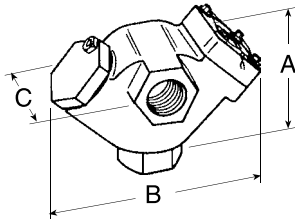
Please read carefully and thoroughly all of the **CAUTIONS** on the inside back cover.

Series 18 &19 Quick Exhaust and Shuttle Valves

Quick Exhaust Valves

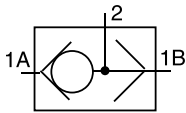


Quick cylinder reversal can be a problem if the control valve is at a distance from the cylinder or otherwise restricts the exhaust flow. A ROSS quick exhaust valve near the cylinder opens as soon as the controls valve begins exhausting, and thus allows quick reversal of the cylinder.

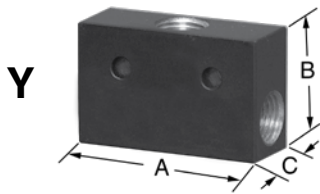


Port Size		Valve Model Number	Avg. C_v		Dimensions inches (mm)			Weight lb (kg)
In-Out	Exh.		In-Out	Out-Exh.	A	B	C	
3/8	1/2	1868A3005	2.9	3.4	3.2 (81)	4.7 (119)	2.0 (51)	1.0 (0.5)
1/2	1/2	1868A4005	2.9	3.4	3.2 (81)	4.7 (119)	2.0 (51)	1.0 (0.5)
3/4	1	1868A5005	7.2	10	4.3 (110)	6.5 (165)	2.6 (65)	2.5 (1.1)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

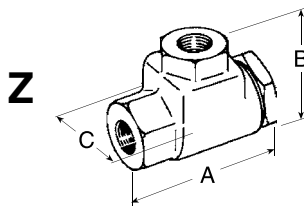
Shuttle Valves



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)			Weight lb (kg)
				A	B	C	
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; 5 micron recommended.

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.

IMPORTANT NOTE

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

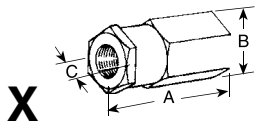


Series 19 Check Valves

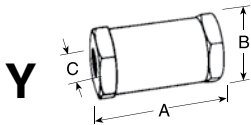
ROSS check valves are self-actuating and designed to provide free air flow in one direction, and to be closed to flow in the opposite direction.



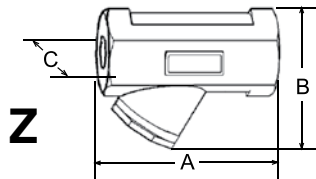
Large Check Valve Illustrated



X



Y



Z

Valve Type	Port Size	Valve Model Number	Avg. C_v	Dimensions inches (mm)			Weight lb (kg)
				A	B	C	
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)
Z*	1/2	1968D4001	3.9	3.7 (94)	1.5 (40)	1.4 (35)	0.5 (0.2)
	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)
	1 1/4	1968A7107	22	5.4 (137)	4.3 (109)	2.3 (58)	2.0 (0.9)
Z*	1 1/2	1968A8117	22	5.4 (137)	4.3 (109)	2.3 (58)	2.0 (0.9)
	1 1/2	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)
	2 1/2	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 C_v 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; 5 micron recommended.

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.

Series 27 Pilot Operated Check Valves



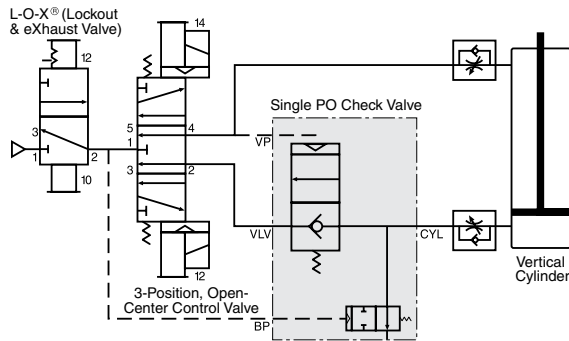
Single Pilot Operated Check Valve with trapped pressure relief illustrated

- Can be used wherever a high-flow or remotely-controlled checking function is needed.
- Can be used 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.
- For special applications where there is a restriction in the operating valve's exhaust, some models of the Type B check valve (see below) are available with heavier springs. It should be noted, however, that the heavier spring will raise the required pilot pressure for the check valve.

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.
- The single PO check with pressure relief have an additional 1/8" NPT port provided for the installation of a pressure sensing device such as a pop-up indicator or pressure switch as shown on page 106. Standards suggest that machine design should include a method for verifying the release of stored energy.

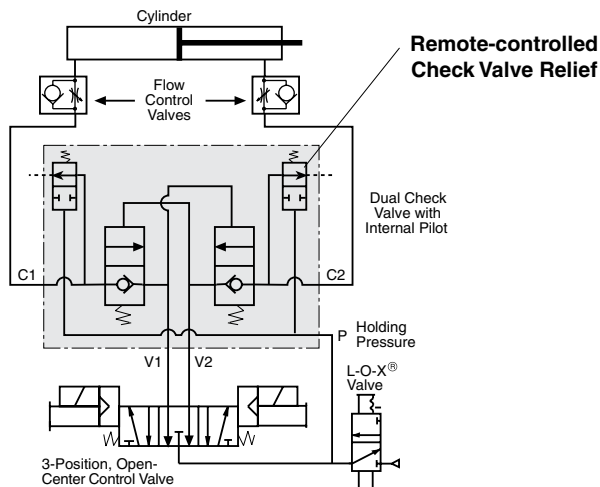
Single Pilot Operated Check Valve with Trapped Pressure Relief Application



IMPORTANT NOTES and CAUTIONS:

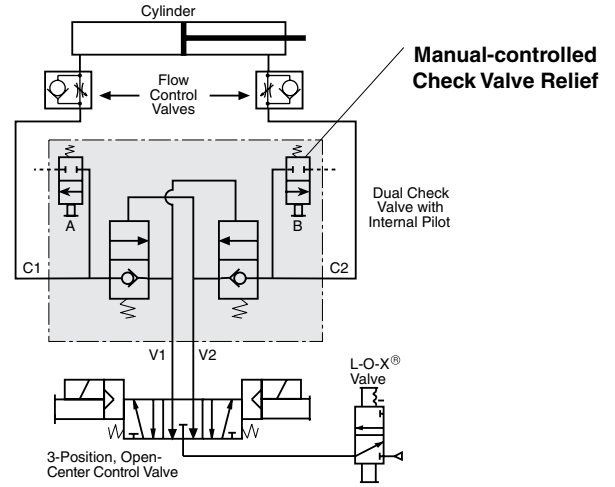
- Cylinder movement may occur when inlet pressure is lost. The cylinder's movement is slowed only by the restrictions of the flow control valves, and by the exhaust capacity of the check valve relief flow capacity.
- For best response, flow control valves should be installed between the check valve and 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.

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 Manual Trapped Pressure Relief Application



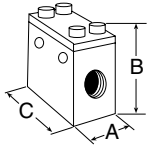
Trapped pressure between check valve and cylinder is exhausted when push buttons A and B are pressed.

For further installation and application information, refer to ROSS Bulletin 430 (form number A10112).

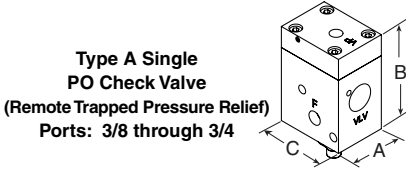


Series 27 Pilot Operated Check Valves

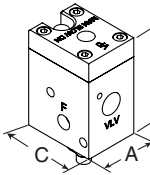
Pressure Controlled



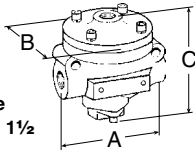
Type A Single PO Check Valve
Ports: 1/4 through 1/2



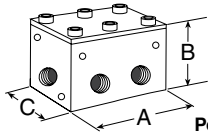
Type A Single PO Check Valve
(Remote Trapped Pressure Relief)
Ports: 3/8 through 3/4



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

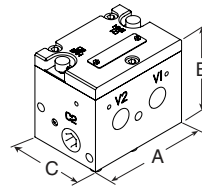
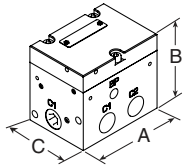


Type B Single PO Check Valve
Ports: 1/4 through 1 1/2



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)			Weight lb (kg)	
				A	B	C		
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	1.65 (41.9)	3.57 (90.6)	2.2 (55.9)	1.8 (0.8)	
	1/2	2751B4922	2.8	1.65 (41.9)	3.57 (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	1.65 (41.9)	3.47 (88)	2.2 (55.9)	1.8 (0.8)	
	1/2	2751B4920	2.8	1.65 (41.9)	3.47 (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)	
	1 1/4	2751B7901	29	6.7 (169)	6.5 (165)	4.1 (104)	6.0 (2.7)	
	1 1/2	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)	
C Dual	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)	3.64 (92.4)	2.6 (66.1)	3.5 (1.6)
		1/2	2768D4901	3.2	3.6 (91.4)	3.64 (92.4)	2.6 (66.1)	3.5 (1.6)
3/4		2768D5901	8.5*	4.98 (126.5)	4.24 (107.7)	3.4 (86.4)	5.2 (2.3)	
D Remote	1	2768D6901	8.5*	4.98 (126.9)	4.24 (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)	4.24 (107.7)	3.4 (86.4)	5.2 (2.3)	
D Manual	1	2768D6904	8.5*	4.8 (122)	4.24 (107.7)	3.4 (86.4)	8.8 (4.0)	

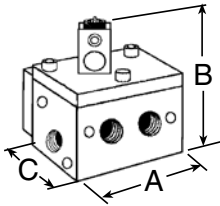
*Effective C_v varies with load and pressure drop. Consult ROSS for specifics on your system.

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: 15 to 150 psig (1 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. D2751A2908.

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

Series 27 Pilot Operated Check Valves

Solenoid Pilot Controlled

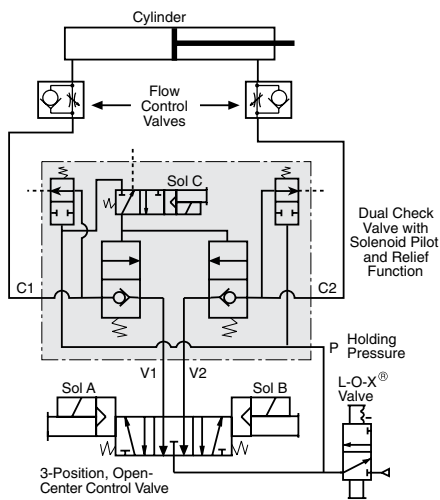


Type E Solenoid Pilot
Dual PO Check Valve
Ports: 3/8 through 1

Valve Type	Port Size	Avg. C_v	DIN Connector	3-Pin Mini Connector	24 volts DC		Dimensions inches (mm)			Weight lb (kg)
					3-Pin Mini Connector	4-Pin Micro Connector	A	B	C	
E	3/8	2.9	2778D3900	2778D3901	2778D3902	2778D3904	3.60 (91.4)	5.67 (144)	2.60 (66.1)	4.0 (1.8)
	1/2	3.2	2778D4900	2778D4901	2778D4902	2778D4904	3.60 (91.4)	5.67 (144)	2.60 (66.1)	4.2 (1.9)
	3/4	8.5*	2778D5900	2778D5901	2778D5902	2778D5904	4.98 (126.5)	6.77 (172)	3.40 (86.4)	6.1 (2.8)
	1	8.5*	2778B6900	2778B6901	2778B6902	2778B6904	4.98 (126.5)	6.77 (172)	3.40 (86.4)	6.1 (2.8)

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

Solenoid Pilot Controlled Dual Check Valve 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.

For further installation and application information, consult ROSS Bulletin 430, form number A10112.

STANDARD SPECIFICATIONS: For valves on this page.
Solenoids: AC or DC power.
Standard Voltages: See page 110; 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 Temperature: 40° to 120°F (4° to 50°C).
Ambient Media Temperature: 40° to 175°F (4° to 80°C).
Flow Media: Filtered air; 5 micron recommended.

Inlet Pressure: 30 to 150 psig (2 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. D2778D3900.

IMPORTANT NOTE

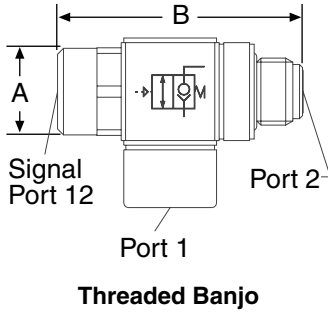
Please read carefully and thoroughly all of the **CAUTIONS** on the inside back cover.



Right-Angle Pilot Operated Check Valves

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.



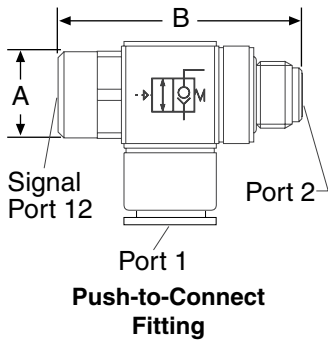
Models with Threaded Banjo

Port Size		Valve Model Number	Avg. C _v		Dimensions inches (mm)		Tightening Torque Max. Ft-lb (Nm)
Port 1*	Port 2**		1 to 2	2 to 1	A	B	
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.

Models with Push-to-Connect Fitting



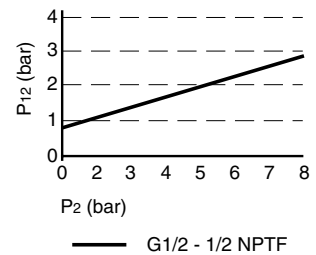
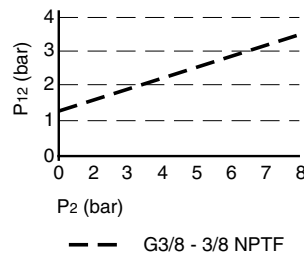
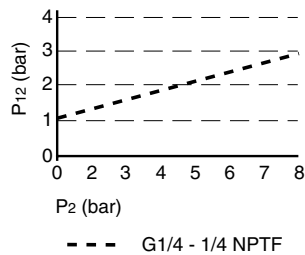
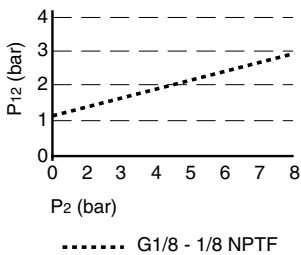
Port Size		Valve Model Number	Avg. C _v		Dimensions inches (mm)		Tightening Torque Max. Ft-lb (Nm)
Port 1* (tube size)	Port 2** (thread size)		1 to 2	2 to 1	A	B	
5/32"	1/8	1958A1115	0.4	0.4	0.5 (13)	1.7 (41)	11.06 (15)
1/4"	1/8	1958A1125	0.4	0.4	0.5 (13)	1.7 (41)	11.06 (15)
1/4"	1/4	1958A2135	0.8	0.7	0.7 (17)	1.9 (48)	14.75 (20)
3/8"	1/4	1958A2115	0.8	0.7	0.7 (17)	1.9 (48)	14.75 (20)
3/8"	3/8	1958A3135	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 (P₂) when there is no pressure at port 1 (P₁ = 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.

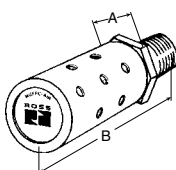


MUFFL-AIR® Silencers

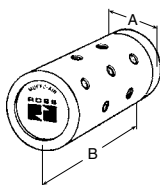
ROSS MUFFL-AIR® silencers substantially reduce exhaust noise levels yet produce little back pressure. Typical impact noise reduction is in the 20–25 dB range.



MUFFL-AIR® Silencer
male threads illustrated



Male Pipe Threads
For ports 1/8 through 1¼



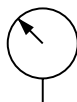
Female Pipe Threads
For ports 1¼ through 2½

Port Size	NPT Threads	Model Numbers	Average C _v	Dimensions inches (mm)		Weight lb (kg)
				A	B	
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 bar) maximum.

Gauges

Pressure Gauges



Port Size	Model Numbers	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)

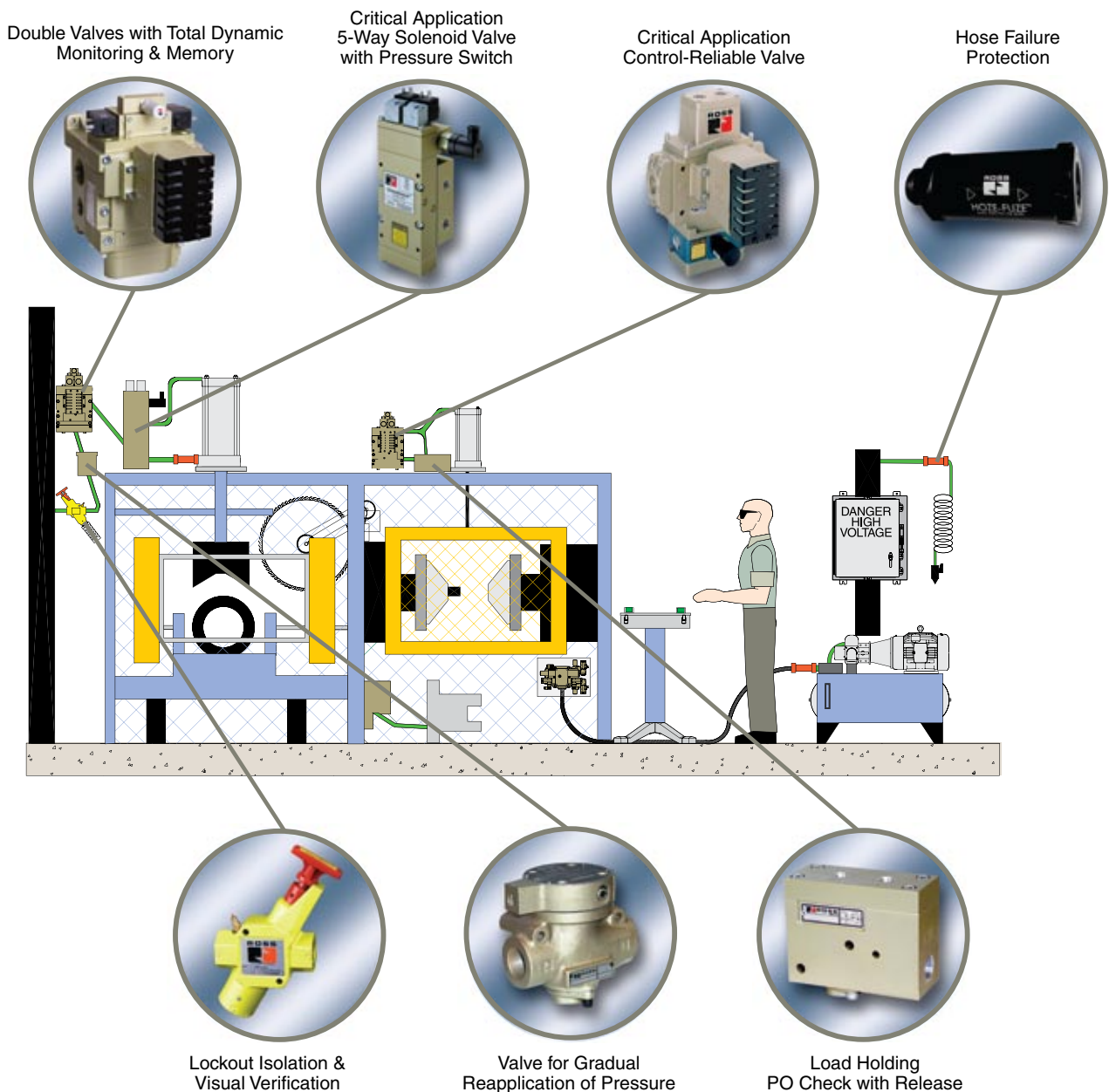
ROSS Safety-Related History

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.

ROSS Safety-Related Solutions

- 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.



Series 15 Manual L-O-X® (Lockout & Exhaust) Valves

Pneumatic Energy Isolation for LOTO



Manual L-O-X® family

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® with EEZ-ON® operation valves, 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 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 Teflon 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.

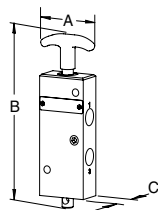
With ROSS' manual L-O-X® with EEZ-ON® operation valves, you get even more value. Combining the lockout function of ROSS' L-O-X® valve with the gradual start-up capability of the EEZ-ON®, the manual L-O-X® with EEZ-ON® operation valves gives you two safety-related functions in one convenient unit.

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.

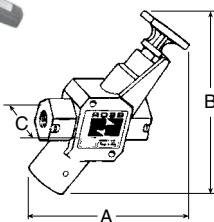
EEZ-ON® valves are available as either 2/2 (2-port, 2-position) or 3/2 (3-port, 2-position) valves. Either type can be used in conjunction with a L-O-X® valve to supply a lockout and exhaust feature in addition to the gradual buildup of supply pressure.

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

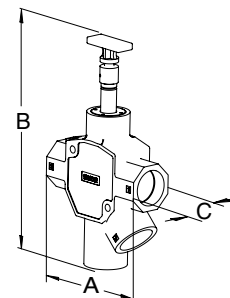
Series 15 Manual L-O-X® Valves



Port Sizes 1/4 and 3/8



Port Sizes 3/8 thru 1 1/4



Port Sizes 1 1/2 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.

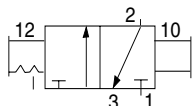
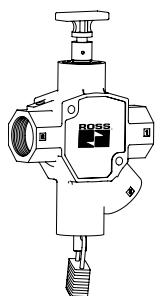
The ROSS manual L-O-X® valve has a large red operating handle for high visibility. When the handle is pulled out, there is full line pressure. A short, full inward push of the handle closes off the flow of air, and quickly exhausts the pressure in the downstream line. This action is swift and doesn't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

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

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		Valve Model Number	Avg. Cv		Dimensions inches (mm)			Weight lb (kg)
In-Out	Exh.		1 to 2	2 to 3	A	B	C	
1/4	1/4	Y1523C2002	1.9	1.9	2.3 (58)	6.5 (166)	1.0 (26)	0.9 (0.4)
3/8	3/8	Y1523C3012	2.5	2.6	2.3 (58)	6.5 (166)	1.0 (26)	0.9 (0.4)
3/8	3/4	Y1523C3002	6.0	8.0	6.3 (159)	8.8 (225)	2.0 (51)	1.5 (0.7)
1/2	3/4	Y1523C4002	7.1	8.3	6.3 (159)	8.8 (225)	2.0 (51)	1.5 (0.7)
3/4	3/4	Y1523C5012	8.6	9.5	6.3 (159)	8.8 (225)	2.0 (51)	1.5 (0.7)
3/4	1 1/4	Y1523C5002	13	12	7.6 (194)	10.6 (270)	2.3 (57)	2.5 (1.1)
1	1 1/4	Y1523C6002	13	14	7.6 (194)	10.6 (270)	2.3 (57)	2.5 (1.1)
1 1/4	1 1/4	Y1523C7012	20	14	7.6 (194)	10.6 (270)	2.3 (57)	2.5 (1.1)
1 1/2	2	Y1523C8002	38	47	8.2 (209)	14.9 (379)	3.0 (77)	8.2 (3.6)
2	2	Y1523C9012	38	47	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 56.

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; 5 micron recommended.

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 1 1/2 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 1 1/2 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.



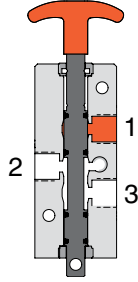
Series 15 Manual L-O-X® Valves

VALVE OPERATION

1/4 and 3/8 Port Sizes

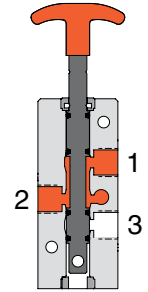
VALVE CLOSED

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

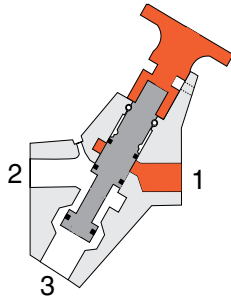
When the red handle is pulled outward supply air flows freely from inlet to outlet and flow to exhaust is blocked. A detent keeps the handle in the open position.



3/8 thru 1 1/4 Port Sizes

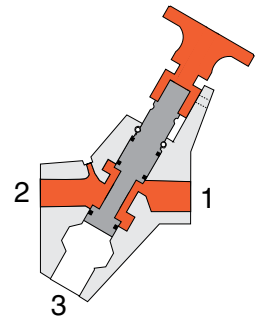
VALVE CLOSED

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

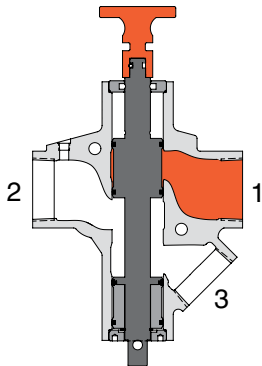
When the red handle is pulled out, supply air flows freely from inlet to outlet and flow to exhaust is blocked. A detent keeps the handle in the open position. The handle is not designed to be locked in this position, thereby providing for ready shut-off when necessary.



1 1/2 and 2 Port Sizes

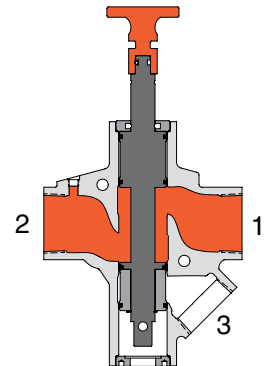
VALVE CLOSED

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

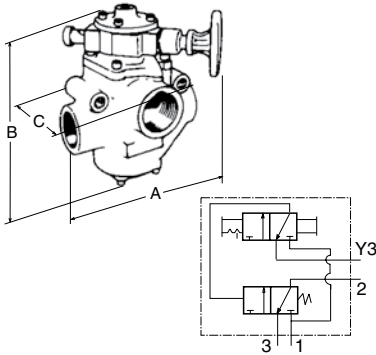
L-O-X® Sensing Port - Series 15 manual L-O-X® and manual L-O-X® with EEZ-ON® operation valves are now provided with 1/8 NPT sensing ports, enabling installation of a pressure sensing device such as the Pop-Up Indicator or Pressure Switch shown below. Standards suggest that machine design should include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

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

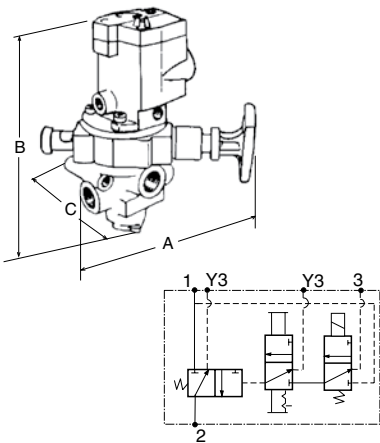
MANUAL PILOT



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

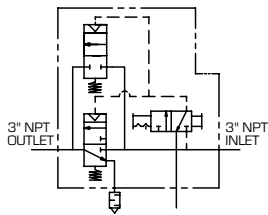
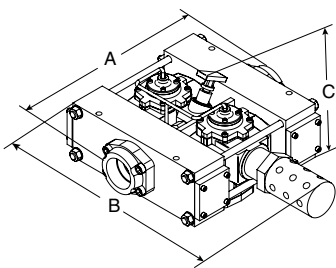
Port Size In-Out	Exh.	Valve Model Number*	Avg. Cv		Dimensions inches (mm)			Weight lb (kg)
			1 to 2	2 to 3	A	B	C	
1½	2½	Y2783A8006	68	70	8.4 (213)	10.2 (259)	6.6 (162)	15.3 (6.9)
2	2½	Y2783A9006	70	70	8.4 (213)	10.2 (259)	6.6 (162)	15.3 (6.9)
2½	2½	Y2783A9016	70	71	8.4 (213)	10.2 (259)	6.6 (162)	15.3 (6.9)
3	2½	Y3900A0829**	140	140	19.6 (496)	25.3 (643)	11.5 (292)	110 (49.9)

SOLENOID PILOT

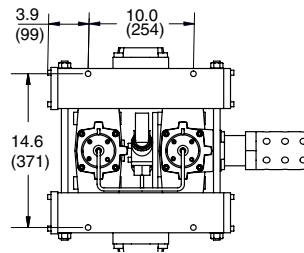


Port Size In-Out	Exh.	Valve Model Number*	Avg. Cv		Dimensions inches (mm)			Weight lb (kg)
			1 to 2	2 to 3	A	B	C	
1/4	1/2	Y2773A2072	2.5	3.1	7.1 (181)	8.4 (212)	6.5 (165)	3.5 (1.6)
3/8	1/2	Y2773A3072	3.6	5.3	7.1 (181)	8.4 (212)	6.5 (165)	3.5 (1.6)
1/2	1/2	Y2773A4082	3.3	5.3	7.1 (181)	8.4 (212)	6.5 (165)	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)

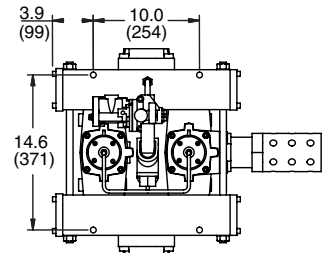
** 3 Inch L-O-X® Valve for Lockout



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 56.

L-O-X® Sensing Port

L-O-X® Sensing Port - Series 15 manual L-O-X® and manual L-O-X® with EEZ-ON® operation valves 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.

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

STANDARD SPECIFICATIONS: See page 62.



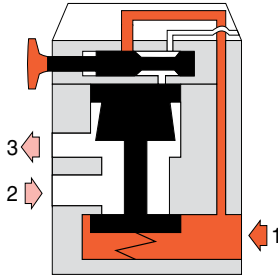
Series 27 Piloted Valves with L-O-X® Control

VALVE OPERATION

MANUAL PILOT

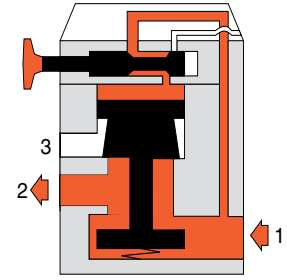
VALVE CLOSED

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

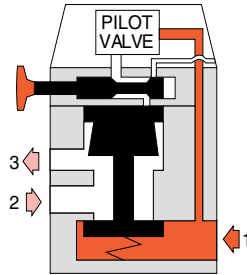
With the red handle pulled out, pilot air flows to the top of the actuating piston, causing it to open the inlet poppet. Supply air then flows freely from inlet to outlet, and the exhaust port is blocked. A detent keeps the L-O-X® handle in the open position. The handle is designed not to be locked in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



SOLENOID PILOT

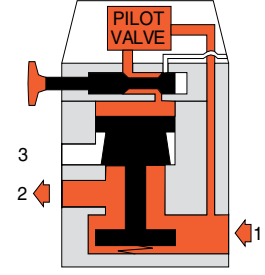
PILOT DE-ENERGIZED

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.



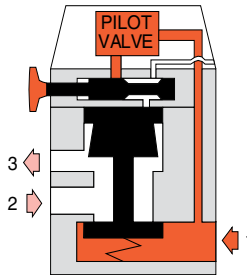
PILOT ENERGIZED

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

STANDARD SPECIFICATIONS: For valves on page 61.

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 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 standard, gold. For gold bodies, drop "Y" from the model number, e.g. 2783A6006.

***Port Threads:** NPT standard. For BSPP threads yellow bodies, insert a "D" after "Y" to the model number, e.g. YD2783C6006 and for BSPP threads gold bodies, replace "Y" from the model number with a "D", e.g. D2783A6006.

STANDARD SPECIFICATIONS: For 3 inch L-O-X®:

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).

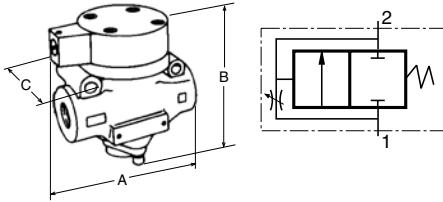
NOTE: Per specifications and regulations, these products are defined as energy isolation devices, **NOT AS EMERGENCY STOP DEVICES.**

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

Series 27 EEZ-ON® Valves

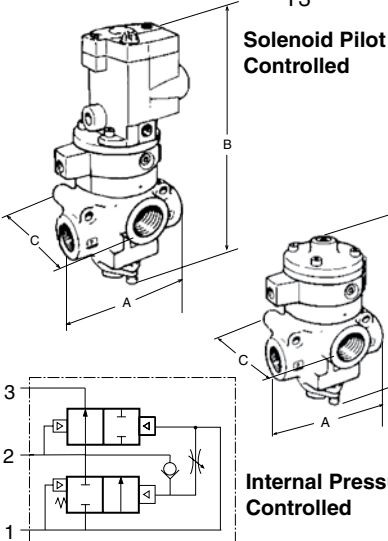
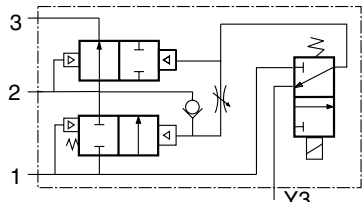
An EEZ-ON® valve is used in an air supply line to provide a gradual buildup of downstream air pressure. This permits cylinders or other work elements to move slowly into their normal working positions before full line pressure is applied. The time required to reach full line pressure is adjustable.

2/2 Valves



Port Size	Valve Model Numbers*	Avg. Cv	Dimensions inches (mm)			Weight lb (kg)
			A	B	C	
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



Port Size In-Out	Exh.	Valve Model Number*	Avg. Cv		Dimensions inches (mm)			Weight lb (kg)
			1 to 2	2 to 3	A	B	C	
Solenoid Pilot Controlled								
1/4	1/2	2773C2037	2.5	3.1	4.1 (105)	8.8 (224)	3.1 (79)	4.5 (2.0)
3/8	1/2	2773C3037	3.6	5.3	4.1 (105)	8.8 (224)	3.1 (79)	4.5 (2.0)
1/2	1/2	2773C4047	3.3	5.3	4.1 (105)	8.8 (224)	3.1 (79)	4.5 (2.0)
1/2	1	2773C4037	10.0	13.0	4.9 (124)	9.6 (243)	3.6 (92)	5.0 (2.3)
3/4	1	2773C5037	12.0	15.0	4.9 (124)	9.6 (243)	3.6 (92)	5.0 (2.3)
1	1	2773C6047	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)

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.

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 56.

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; 5 micron recommended.
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, yellow. For yellow bodies, add a "Y" prefix to the model number, e.g. Y2781A2007.
***Port Threads:** NPT standard, BSPP. For BSPP threads, yellow bodies, insert a "D" after "Y" to the model number, e.g. YD2781A2007, and for BSPP threads gold bodies, replace "Y" from the model number with a "D", e.g. D2781A2007.

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



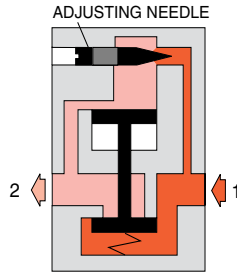
Series 27 EEZ-ON® Valves

VALVE OPERATION

2/2 Valve

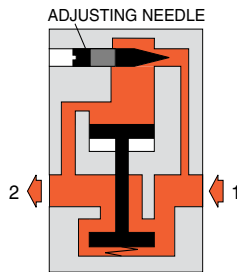
AIR PRESSURE TO INLET

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.



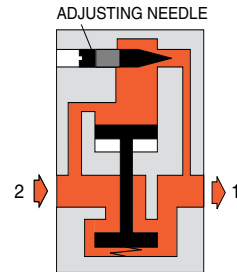
VALVE OPENS TO FULL FLOW

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.



2/2 EEZ-ON®



3/2 Pressure Controlled EEZ-ON®

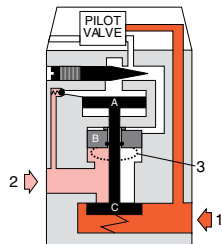


3/2 Solenoid Pilot EEZ-ON®

3/2 Valve

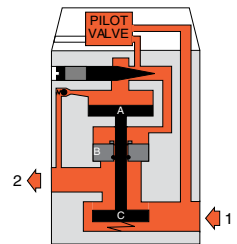
PILOT NOT ENERGIZED

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.



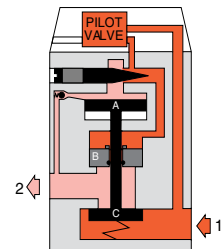
FULL PRESSURE

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.



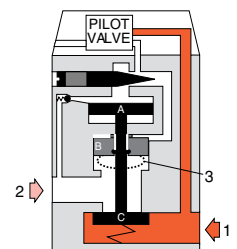
PILOT ENERGIZED

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.



PILOT DE-ENERGIZED

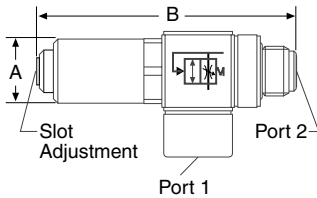
Air above pistons A and B is exhausted through the exhaust port of the pilot valve. Air above poppet C forces sliding piston B upward so that the main exhaust port is opened and the pressurized air is exhausted.



Right-Angle EEZ-ON® Valves

EEZ-ON® Valves

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.



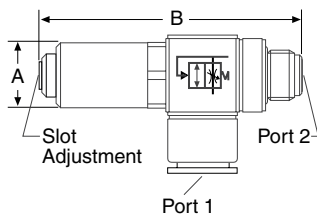
Threaded Banjo

Models with Threaded Banjo

Port Size		Valve Model Numbers		Avg. C_v	Dimensions		Tightening Torque Max. Ft-lb (Nm)
Port 1*	Port 2**	Primary Pressure			inches (mm)		
		At Port 1	At Port 2		A	B	
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.



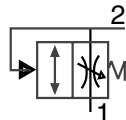
Push-to-Connect Fitting

Models with Push-to-Connect Fitting

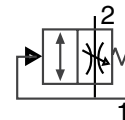
Port Size		Valve Model Numbers		Avg. C_v	Dimensions		Tightening Torque Max. Ft-lb (Nm)
Port 1# (tube size)	Port 2** (thread size)	Primary Pressure			inches (mm)		
		At Port 1	At Port 2		A	B	
5/32"	1/8	1969A1020	1969A1021	0.5	0.5 (13)	2.3 (57)	11.06 (15)
1/4"	1/8	1969A1030	1969A1031	0.5	0.5 (13)	2.3 (57)	11.06 (15)
1/4"	1/4	1969A2020	1969A2021	0.6	0.7 (17)	2.5 (63)	14.75 (20)
3/8"	1/4	1969A2030	1969A2031	0.6	0.7 (17)	2.5 (63)	14.75 (20)
3/8"	3/8	1969A3020	1969A3021	1.5	0.9 (22)	2.8 (69)	22.13 (30)
4 mm	G1/8	D1969A1020	D1969A1021	0.5	0.5 (13)	2.3 (57)	7.38 (10)
6 mm	G1/8	D1969A1030	D1969A1031	0.5	0.5 (13)	2.3 (57)	7.38 (10)
8 mm	G1/8	D1969A1040	D1969A1041	0.5	0.5 (13)	2.3 (57)	7.38 (10)
6 mm	G1/4	D1969A2020	D1969A2021	0.6	0.7 (17)	2.4 (61)	8.85 (12)
8 mm	G1/4	D1969A2030	D1969A2031	0.6	0.7 (17)	2.4 (61)	8.85 (12)
10 mm	G1/4	D1969A2040	D1969A2041	0.6	0.7 (17)	2.4 (61)	8.85 (12)
8 mm	G3/8	D1969A3020	D1969A3021	1.5	0.9 (22)	2.7 (67)	14.75 (20)
10 mm	G3/8	D1969A3030	D1969A3031	1.5	0.9 (22)	2.7 (67)	14.75 (20)

Port 1 tubing size in inches (") or millimeters (mm).

** Port 2 threads are male.



Primary Pressure at port 1



Primary Pressure at port 2

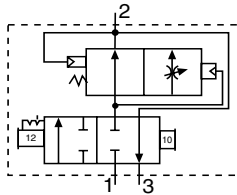
STANDARD SPECIFICATIONS: For valves on this page.
Ambient/Media Temperature: 15° to 160°F (-10° to 70°C).
Flow Media: Filtered air; 5 micron recommended.
Operating Pressure: 45 to 150 psig (3 to 10 bar).

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

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



3/8 - 3/4



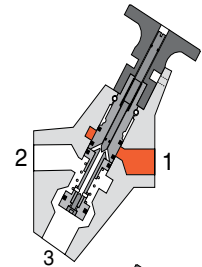
The manual L-O-X® with EEZ-ON® operation valve combines shut-off certainty with gradual pressurization upon start-up. Special labels and adjustment screw indicates EEZ-ON® function.

Combining two functions critical to safety concerns in any application, the ROSS manual L-O-X® with EEZ-ON® operation valve provides the shutdown and the gradual start-up (or, “soft start”) capabilities today’s systems require. In addition, because the manual L-O-X® with EEZ-ON® operation valve 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® with EEZ-ON® operation valve. 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® with EEZ-ON® operation valve.

VALVE OPERATION

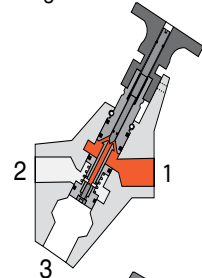
VALVE CLOSED

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® with EEZ-ON® operation valve be padlocked in this position to prevent the handle from being pulled outward inadvertently when potential for human injury exists or servicing machinery.



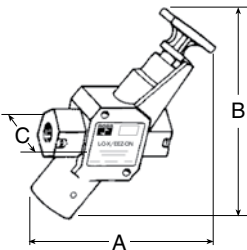
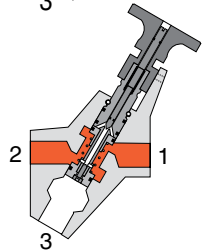
EEZ-ON® VALVE FUNCTION

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	Exh.	Valve Model Numbers*	Avg. Cv 1 to 2	Avg. Cv 2 to 3	Dimensions inches (mm)			EEZ-ON® Valve Cv**	Weight lb (kg)
					A	B	C		
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	1 1/4	Y1523B5102	12.0	10.9	7.7 (196)	10.8 (274)	2.3 (58)	3.0	3.2 (1.5)
1	1 1/4	Y1523B6102	13.7	12.0	7.7 (196)	10.8 (274)	2.3 (58)	3.0	3.2 (1.5)
1 1/4	1 1/4	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® and manual L-O-X® with EEZ-ON® operation valves 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; 5 micron filter recommended.

Inlet Pressure: 30 to 150 psig (2 to 10 bar).

***Body Paint:** Yellow standard, gold. For gold bodies, drop “Y” from the model number, e.g. 1523B3102.

***Port Threads:** NPT standard, BSPP. For BSPP threads yellow bodies, insert a “D” after “Y” to the model number, e.g. YD1523B3102 and for BSPP threads gold bodies, replace “Y” from the model number with a “D”, e.g. D1523B3102.

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.



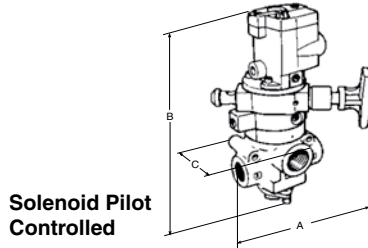
Series 27 Manual L-O-X® with EEZ-ON® Operation Valves

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).**

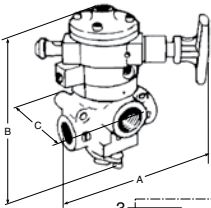
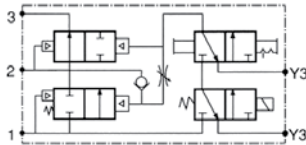


Internal Pressure Controlled

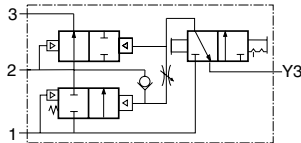
Solenoid Pilot



Solenoid Pilot Controlled



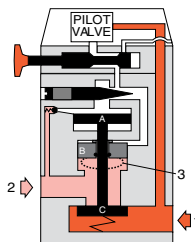
Internal Pressure Controlled



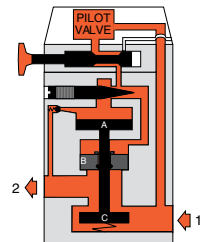
Port Size		Valve Model Number*	Avg. Cv		Dimensions inches (mm)			Weight lb (kg)
In-Out	Exh.		1 to 2	2 to 3	A	B	C	
Solenoid Pilot Controlled								
1/4	1/2	2773B2075	2.5	3.1	7.1(181)	9.9(253)	6.5(165)	5.3(2.4)
3/8	1/2	2773B3075	3.6	5.3	7.1(181)	9.9(253)	6.5(165)	5.3(2.4)
1/2	1/2	2773B4085	3.3	5.3	7.1(181)	9.9(253)	6.5(165)	5.3(2.4)
1/2	1	2773B4075	10.0	13.0	7.1(181)	10.6(269)	6.9(175)	6.0(2.7)
3/4	1	2773B5075	12.0	15.0	7.1(181)	10.6(269)	6.9(175)	6.0(2.7)
1	1	2773B6085	12.0	16.0	7.1(181)	10.6(269)	6.9(175)	6.0(2.7)
1	1½	2773A6075	23.0	34.0	7.4(188)	11.6(296)	6.9(175)	9.5(4.3)
1¼	1½	2773A7075	30.0	32.0	7.4(188)	11.6(296)	6.9(175)	9.5(4.3)
1½	1½	2773A8085	30.0	31.0	7.4(188)	11.6(296)	6.9(175)	9.5(4.3)
Internal Pressure Controlled								
1	1½	2783A6055	23.0	34.0	7.4(188)	11.6(296)	6.9(175)	9.5(4.3)
1¼	1½	2783A7055	30.0	32.0	7.4(188)	11.6(296)	6.9(175)	9.5(4.3)
1½	1½	2783A8067	30.0	31.0	7.4(188)	11.6(296)	6.9(175)	9.5(4.3)

VALVE OPERATION

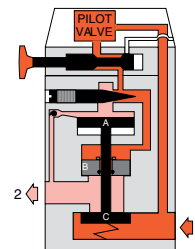
L-O-X® handle open and pilot not energized. Pilot air is blocked by the pilot. Any downstream pressure forces piston B (which slides on the valve stem) upward. This opens the exhaust port and vents the downstream line.



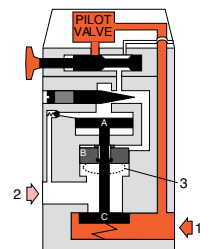
Full Pressure. When the pressure on piston A reaches approximately 50 percent of inlet pressure, it is forced downward and opens inlet poppet C. Full inlet pressure now flows freely to the outlet port.



L-O-X® handle 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.



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 56.

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; 5 micron recommended.
Inlet Pressure: 42 to 150 psig (2.8 to 10 bar).

***Body Paint:** Gold, yellow. For yellow bodies, add a "Y" prefix to the model number, e.g. Y2773B2075.

***Port Threads:** NPT, BSPP. For BSPP threads, add a "D" prefix to the model number, e.g. D2773B2075.

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:

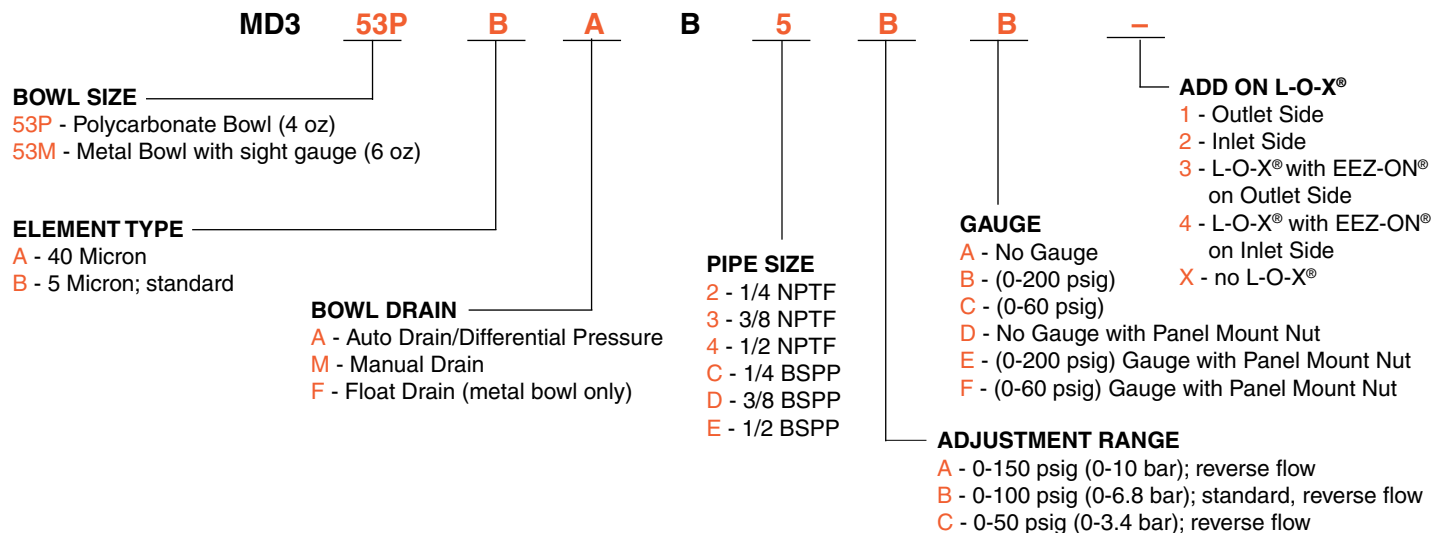
- Filter and regulator consolidated into a single space-saving assembly
- Modular mounting for easy servicing
- Internal automatic drain; optional manual drain or float drain (metal bowl only)
- Reverse flow, self-relieving piston-type regulator; non-relieving optional
- Tamper-resistant pressure setting
- 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.

APPLICATIONS:

- Packaging • Material handling • Conveyor panels • All Air Entry points

HOW TO ORDER

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



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: Compressed 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.

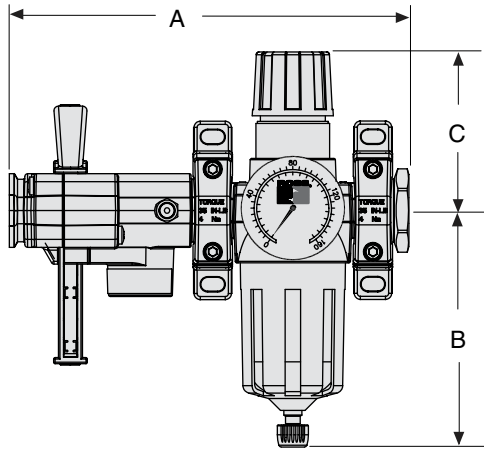
Slide: Acetal.

Threads: NPT standard, BSPP.



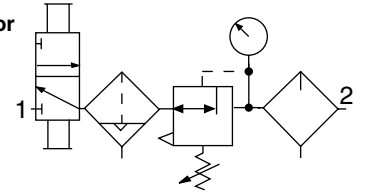
Modular L-O-X®

Air Entry Combination Lockout Valve with Integrated Filter/Regulator



Lockout/Filter/Regulator

ISO Symbol
Lockout
Automatic Drain
Self-relieving



DIMENSIONS inches (mm)

Bowl	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).

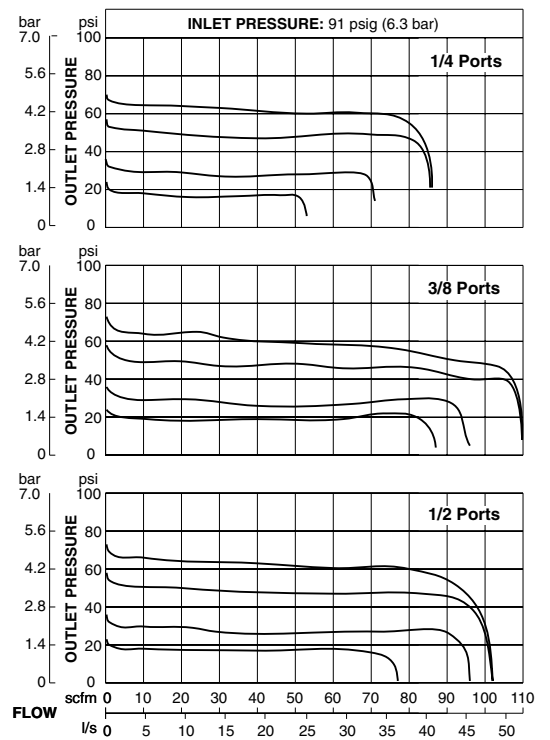
† Less gauge.

REPLACEMENT FILTER ELEMENT KITS

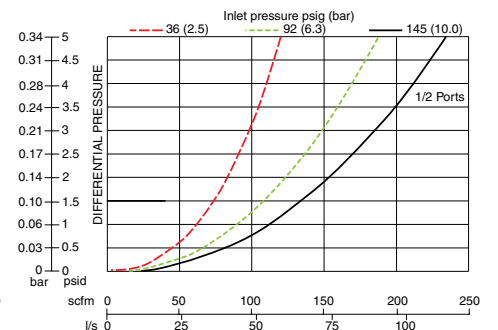
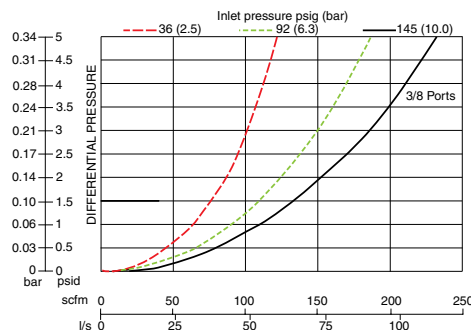
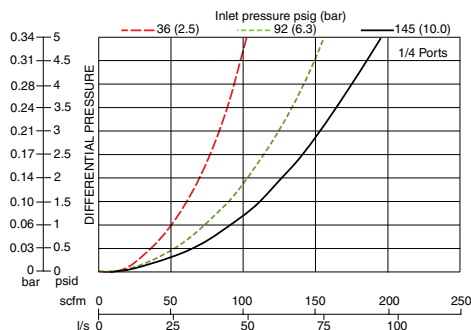
Element Rating	Kit Number
5-µm (Std. element)	936K77
40-µm	938K77

Accessories not included with the product, see air entry combination accessories page for ordering information.

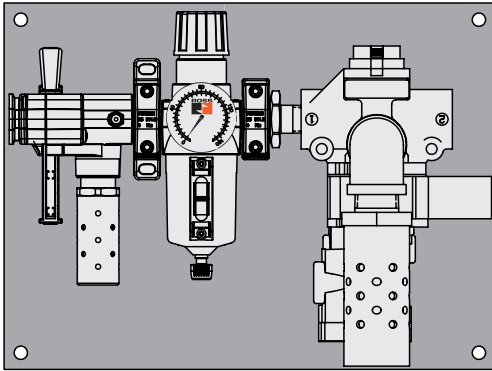
FILTER/REGULATOR FLOW CHARACTERISTICS



LOCKOUT VALVE FLOW CHARACTERISTICS

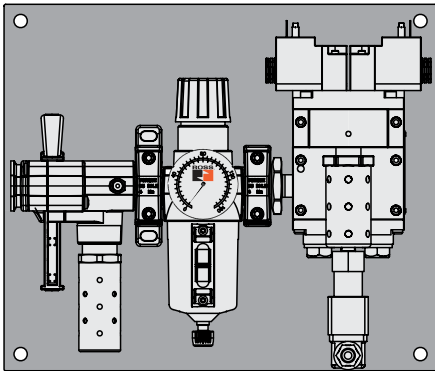


Air Entry Packages with 3/2 Normally Closed Sensing Valve



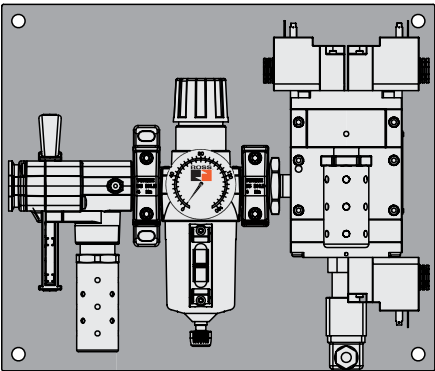
- Pre-engineered panel-mounted design with air entry via filter and regulator “FR”, or filter, regulator, and lubricator “FRL”. Includes 3/2 Normally Closed Sensing Valve which senses poppet position and state. Electrical feedback via DPST switch (Double-Pole Single-Throw).
- Applications include Air Dump and Trapped-Pressure Release.

Air Entry Packages with Control Reliable Energy Isolation



- 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.

Do not use in power press clutch/brake applications.



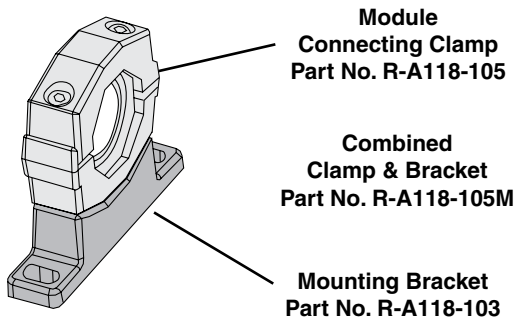
- Pre-engineered panel-mounted design with air entry via a filter and regulator “FR”, or filter, regulator and lubricator “FRL”.
- Includes DM² Series E Double Valve with Monitoring & Memory:
 - a) Self-contained dynamic monitoring system requires no further valve monitoring controls,
 - b) Dynamic memory 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.

Do not use in power press clutch/brake applications.

	Model Number*	Air Entry Type	Port Size		C _v		Length	Dimensions (inches/mm)	
			In-Out	Exh.	1 to 2	2 to 3		Width	Depth
Cat-2 with SV27	RC208-09	FR	1/2	1	6.3	9.2	14.80 (374.9)	11.00 (279.0)	6.60 (167.7)
Cat-2 with SV27	RC208L-09	FRL	1/2	1	6.3	9.2	14.80 (374.9)	11.00 (279.0)	6.60 (167.7)
Cat-3 with DM ¹ Series E	RC304-09	FR	1/4	1/2	1.3	2.4	13.00 (330.0)	11.00 (279.0)	5.40 (134.7)
Cat-3 with DM ¹ Series E	RC306-09	FR	3/8	1/2	1.9	2.4	13.00 (330.0)	11.00 (279.0)	5.40 (134.7)
Cat-3 with DM ¹ Series E	RC304L-09	FRL	1/4	1/2	1.3	2.4	13.00 (330.0)	11.00 (279.0)	5.40 (134.7)
Cat-3 with DM ¹ Series E	RC306L-09	FRL	3/8	1/2	1.9	2.4	13.00 (330.0)	11.00 (279.0)	5.40 (134.7)
Cat-4 with DM ² Series E	RC404-09	FR	1/4	1/2	1.3	2.4	13.00 (330.0)	11.00 (279.0)	5.40 (134.7)
Cat-4 with DM ² Series E	RC406-09	FR	3/8	1/2	1.9	2.4	13.00 (330.0)	11.00 (279.0)	5.40 (134.7)
Cat-4 with DM ² Series E	RC404L-09	FRL	1/4	1/2	1.3	2.4	13.00 (330.0)	11.00 (279.0)	5.40 (134.7)
Cat-4 with DM ² Series E	RC406L-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. The standard Air Entry Packages are supplied with metal bowl and manual drain, for auto drain insert an “A” before the dash (-) in the model number, e.g. RC208A-09.





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

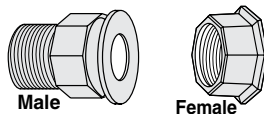
Two brackets are normally used to mount an FRL to a vertical surface. The mounting bracket attaches to the module-connecting clamp (see above) with a single screw. Each bracket then employs two bolts (1/4" or 6mm) to connect the assembly to the mounting surface.

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

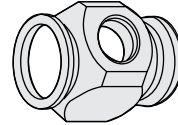
Either male or female end ports can be attached to threaded inlet and outlet lines. This allows all modules of an FRL assembly to be removed easily and quickly without having to unthread the end modules. The end ports are attached to the modules with clamps (see at left). End ports can be included in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



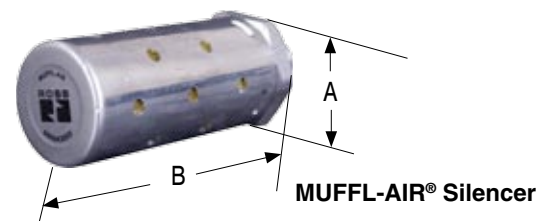
Pressure Switch

SILENCER

MUFFL-AIR® Silencer

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

*NPT port treads, Male.



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.



Hose Size	Thread/Porting	Part Number
1/4	NPT Male-Female	1969A2001
1/4	BSPP Male-Female	D1969A2001
3/8	NPT Male-Female	1969A3001
3/8	BSPP Male-Female	D1969A3001
1/2	NPT Male-Female	1969A4001
1/2	BSPP Male-Female	D1969A4001
3/4	NPT Female	1969A5002
3/4	BSPP Female	D1969A5002
1	NPT Female	1969A6002
1	BSPP Female	D1969A6002

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

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	144
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.



Series SV27 Sensing Valves

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)



**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.

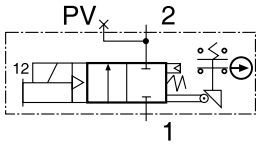
These new sensing valves are available in 2/2 and 3/2 normally closed functions with single solenoid pilot or pressure controlled pilot actuation.

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.

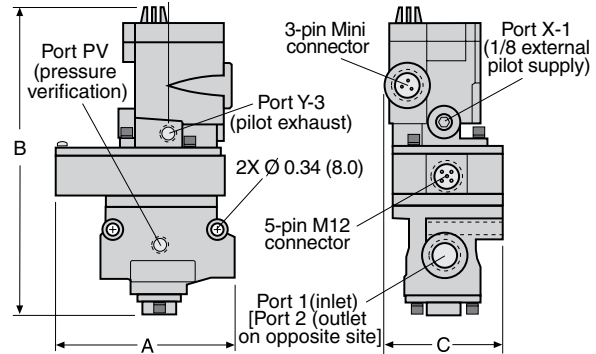
Series SV27 Solenoid Pilot Controlled Sensing Valves

2/2 Valves

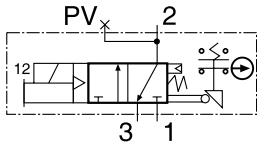


Port Size	Valve Model Number	C _v 1 - 2	Dimensions inches (mm)			Weight lb (kg)
			A	B	C	
1/2	SV27NC105407PSAA1A**	7.7	5.7 (145)	9.3 (235)	3.1 (77)	4.6 (2.1)
3/4	SV27NC105507PSAA1A**	9.0	5.7 (145)	9.3 (235)	3.1 (77)	4.6 (2.1)
1	SV27NC105607PSAA1A**	9.0	5.7 (145)	9.3 (235)	3.1 (77)	4.6 (2.1)
1	SV27NC107607PSAA1A**	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".

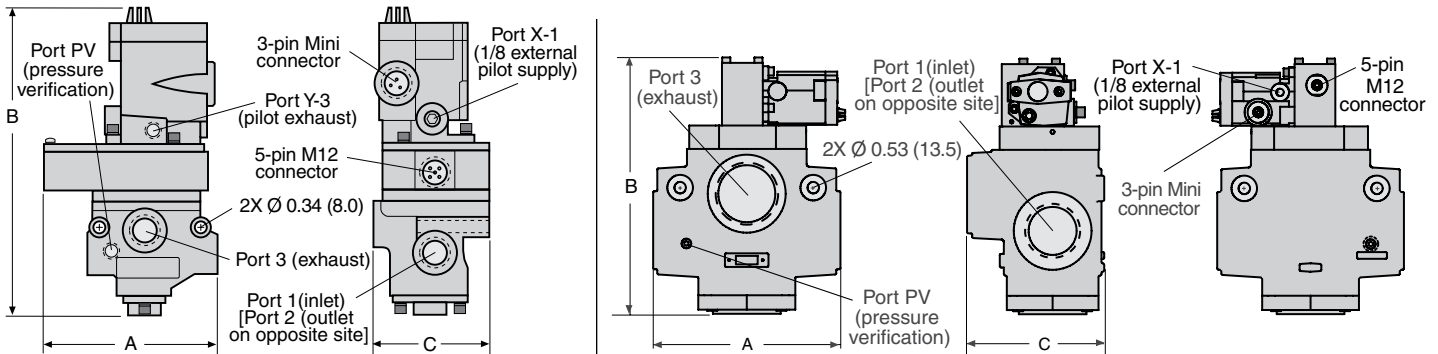


3/2 Valves



Port Size	1, 2 3	Valve Model Number	C _v		Dimensions inches (mm)			Weight lb (kg)
			1 - 2	3	A	B	C	
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; 5 micron recommended.

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.

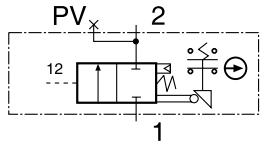
NOTE: Electrical life of switch varies with conditions and voltage; rated in excess of 15 million cycles.

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

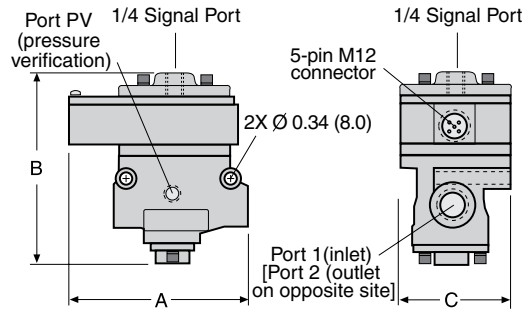


Series SV27 Pressure Controlled Sensing Valves

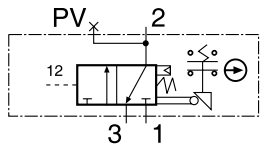
2/2 Valves



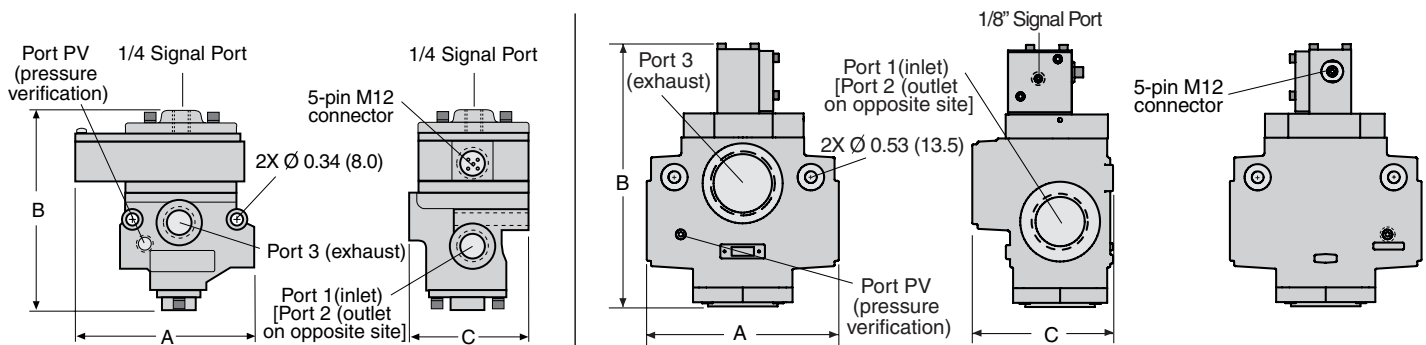
Port Size	Valve Model Number	C _v 1 - 2	Dimensions inches (mm)			Weight lb (kg)
			A	B	C	
1/2	SV27NC105405ASAA	7.7	5.7 (145)	6.1 (155)	3.1 (79)	3.4 (1.6)
3/4	SV27NC105505ASAA	9.0	5.7 (145)	6.1 (155)	3.1 (79)	3.4 (1.6)
1	SV27NC105605ASAA	9.0	5.7 (145)	6.1 (155)	3.1 (79)	3.4 (1.6)
1	SV27NC107605ASAA	24	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	Valve Model Number	C _v		Dimensions inches (mm)			Weight lb (kg)
		1 - 2	3	A	B	C	
1/2	SV27NC305405ASAA	6.3	9.2	5.7 (145)	6.4 (163)	3.6 (91)	3.3 (1.5)
3/4	SV27NC305505ASAA	7.7	11	5.7 (145)	6.4 (163)	3.6 (91)	3.3 (1.5)
1	SV27NC305605ASAA	8.0	12	5.7 (145)	6.4 (163)	3.6 (91)	3.3 (1.5)
1	SV27NC307605ASAA	23	34	6.8 (173)	8.8 (222)	4.9 (123)	6.4 (2.9)
1¼	SV27NC307705ASAA	30	32	6.8 (173)	8.8 (222)	4.9 (123)	6.4 (2.9)
1½	SV27NC307805ASAA	30	31	6.8 (173)	8.8 (222)	4.9 (123)	6.4 (2.9)
1½	SV27NC309805ASAA	68	70	8.7 (219)	11.8 (300)	6.4 (161)	17.2 (7.8)
2	SV27NC309905ASAA	70	70	8.7 (219)	11.8 (300)	6.4 (161)	17.2 (7.8)
2½	SV27NC309955ASAA	70	71	8.7 (219)	11.8 (300)	6.4 (161)	17.2 (7.8)



STANDARD SPECIFICATIONS: For valves on page 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 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.

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



Preassembled Wiring Kits for Series SV27 Sensing Valves

Wiring Kits

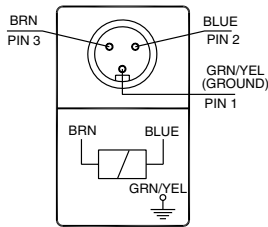
These kits are available in lengths of 4 or 10 meters, with a cord grip on each cable. The kits for SV27 solenoid pilot controlled models come with 2 cables; one with a 3-pin MINI connector for the solenoid and one with a 5-pin M12 (Micro) connector for the sensing switch. The kits for the pressure controlled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

(Note: Each cable has one connector.)

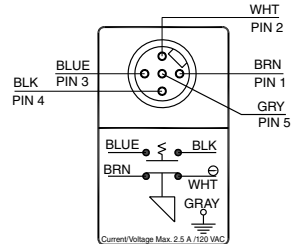
Kit Number	Valve Type	Length (meters)	No. of Cables
2239H77	Solenoid Pilot	4	2
2240H77	Solenoid Pilot	10	2
2241H77	Pressure Controlled	4	1
2242H77	Pressure Controlled	10	1

*For 3/4 and 1 1/4 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.

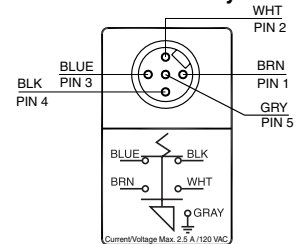
Solenoid Cable with 3-pin MINI Connector



Sensing Switch Cable with 5-pin M12 Connector for 3/4 and 1 1/4 bodies.

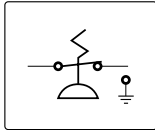


Sensing Switch Cable with 5-pin M12 Connector for 2 inch body.



Optional Pressure Switch Kit (608A86)

Schematic

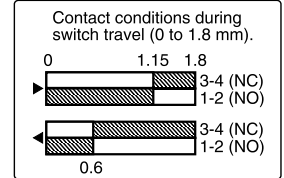
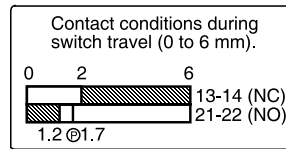


Note: Pressure switch closes on falling pressure of 5 psig.

Integrated Double-Pole Single-Throw Switch (DPST)

Switch States for 2 inch body

Switch States for 3/4 and 1 1/4 bodies

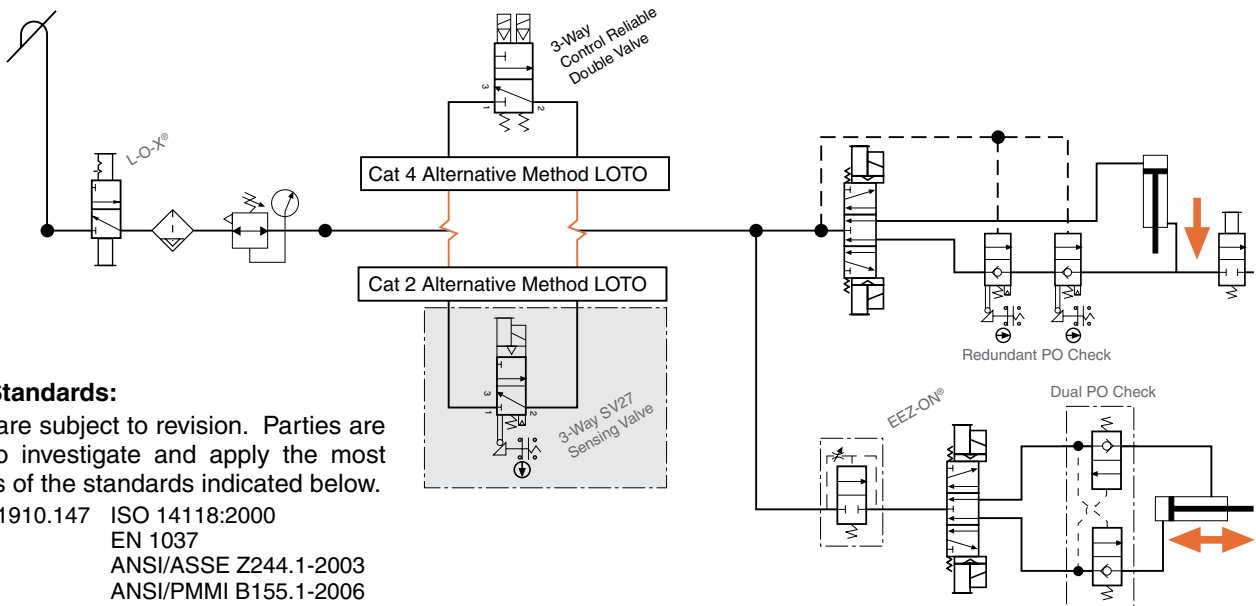


General Illustration Safety-Related Applications

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

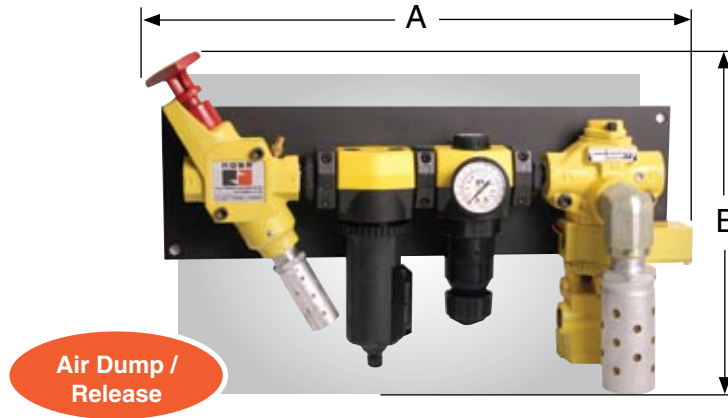
DISCLAIMER

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.

Air Entry Packages with 3/2 Normally Closed Sensing Valve



- 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		C _v		Dimensions (inches/mm)		
		Inlet	Outlet	1 to 2	2 to 3	A	B	Depth
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.

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.

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)



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



**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.

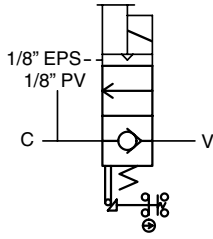
FEATURES:

- 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).



Series SV27 Solenoid Pilot Controlled PO Check Sensing Valves

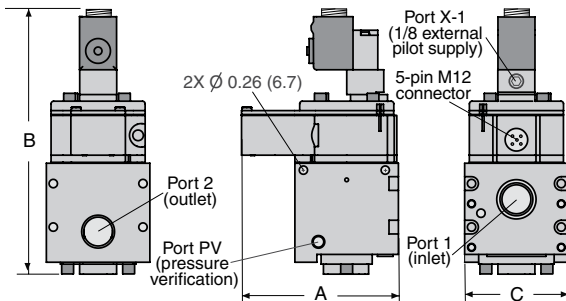
2/2 Valves



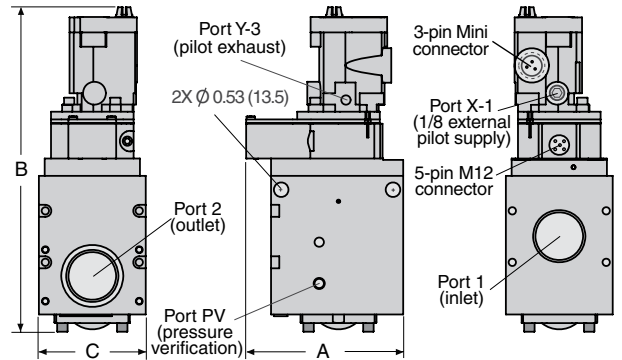
Port Size	Valve Model Numbers*	C _v 1 - 2	Dimensions inches (mm)			Weight lb (kg)
			A	B	C	
1/2	SV27NC115408CSAA1A**	4.5	5.0 (127)	8.5 (215)	3.3 (84)	5.0 (2.3)
3/4	SV27NC115508CSAA1A**	8.3	5.0 (127)	8.5 (215)	3.3 (84)	5.0 (2.3)
1	SV27NC115608CSAA1A**	10.3	5.0 (127)	8.5 (215)	3.3 (84)	5.0 (2.3)
1	SV27NC117608CSAA1A**	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 240 volts, 60 Hz, change "1A" to "2A"; for 24 volts, 60 Hz, change "1A" to "3A" ; for 24 volts DC, change "1A" to "1D".

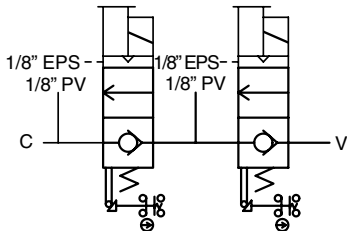
Solenoid Pilot Controlled Model (CNOMO Style)



Solenoid Pilot Controlled Model (Pacer Style)



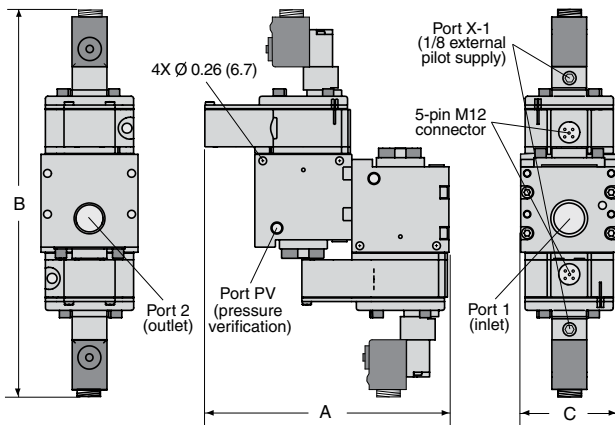
2/2 Valves Redundant



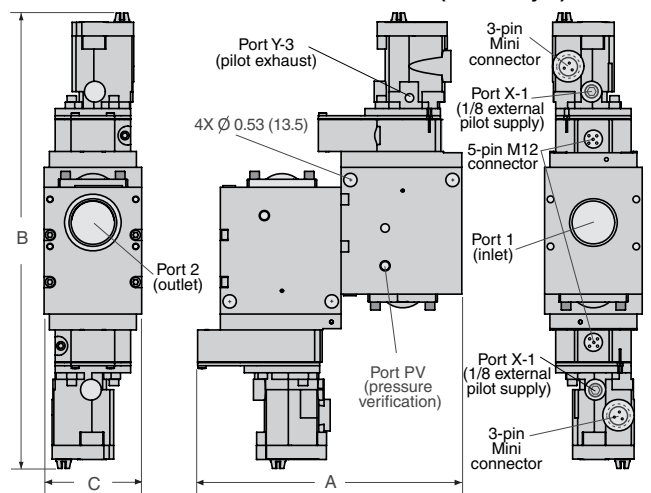
Port Size	Valve Model Numbers*	C _v 1 - 2	Dimensions inches (mm)			Weight lb (kg)
			A	B	C	
1/2	SV27NC555408CSAA1A**	3.8	8.3 (211)	13.2 (335)	3.3 (84)	10.0 (4.5)
3/4	SV27NC555508CSAA1A**	5.6	8.3 (211)	13.2 (335)	3.3 (84)	10.0 (4.5)
1	SV27NC555608CSAA1A**	8	8.3 (211)	13.2 (335)	3.3 (84)	10.0 (4.5)
1	SV27NC557608CSAA1A**	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 240 volts, 60 Hz, change "1A" to "2A"; for 24 volts, 60 Hz, change "1A" to "3A" ; for 24 volts DC, change "1A" to "1D".

Solenoid Pilot Controlled Model (CNOMO Style)



Solenoid Pilot Controlled Model (Pacer Style)

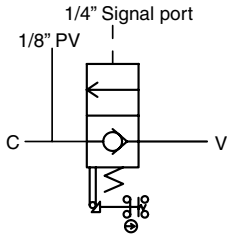


STANDARD SPECIFICATIONS: See page 80.

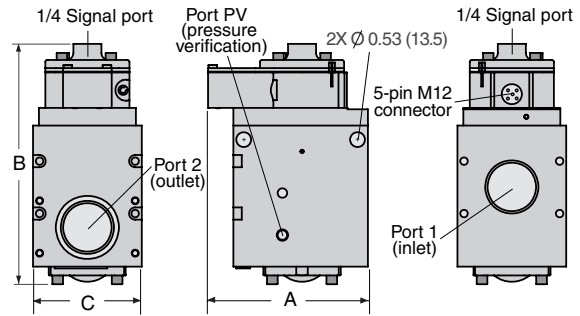
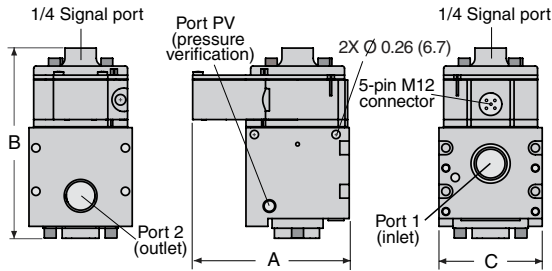


Series SV27 Pressure Controlled PO Check Sensing Valves

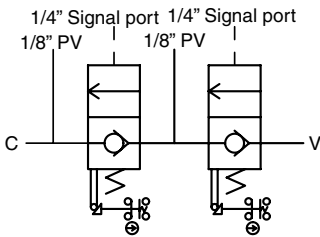
2/2 Valves



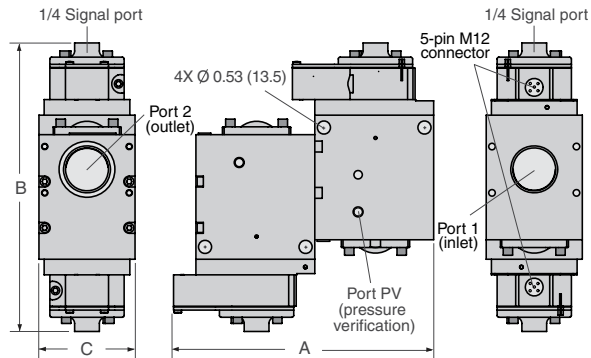
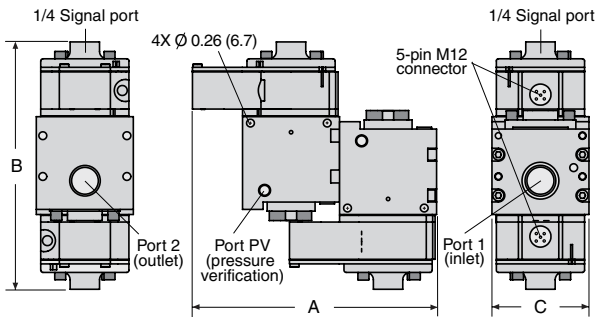
Port Size	Valve Model Numbers*	C _v 1 - 2	Dimensions inches (mm)			Weight lb (kg)
			A	B	C	
1/2	SV27NC115405ASAA	4.5	5.0 (127)	6.1 (154)	3.3 (84)	4.0 (1.8)
3/4	SV27NC115505ASAA	8.3	5.0 (127)	6.1 (154)	3.3 (84)	4.0 (1.8)
1	SV27NC115605ASAA	10.3	5.0 (127)	6.1 (154)	3.3 (84)	4.0 (1.8)
1	SV27NC117605ASAA	20	5.7 (145)	8.6 (218)	3.8 (99)	11.0 (5.0)
1 1/4	SV27NC117705ASAA	29	5.7 (145)	8.6 (218)	3.8 (99)	11.0 (5.0)
1 1/2	SV27NC117805ASAA	33	5.7 (145)	8.6 (218)	3.8 (99)	11.0 (5.0)



2/2 Valves Redundant



Port Size	Valve Model Numbers*	C _v 1 - 2	Dimensions inches (mm)			Weight lb (kg)
			A	B	C	
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)
1 1/4	SV27NC557705ASAA	19	10.5 (267)	11.7 (296)	3.5 (88)	22.0 (10.0)
1 1/2	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; 240 volts AC, 60 Hz; 24 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; 5 micron recommended.

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 Series SV27 Sensing PO Check Valves

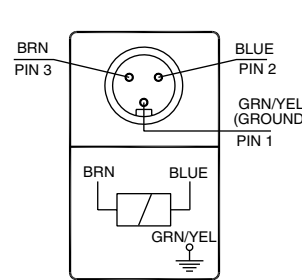
Wiring Kits

These kits 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.)

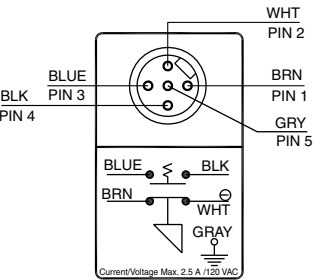
For SV27 Redundant PO Check valves (CAT 3), order 2 kits.

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

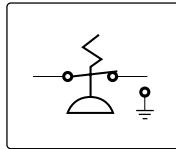


Sensing Switch Cable with 5-pin M12 Connector.



Optional Pressure Switch Kit (608A86)

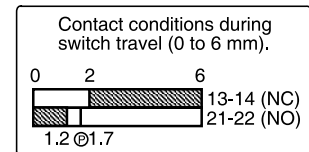
Schematic



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

Integrated Double-Pole Single-Throw Switch (DPST)

Switch States

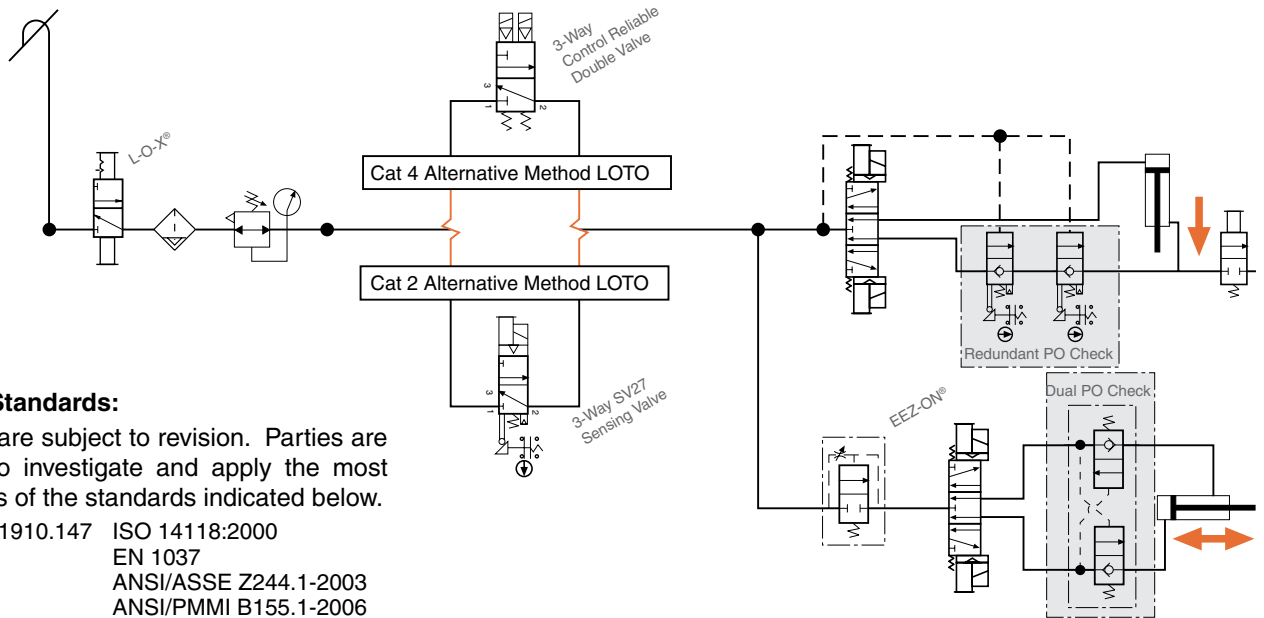


General Illustration Safety-Related Applications

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ROSS Safety-Related Applications:

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

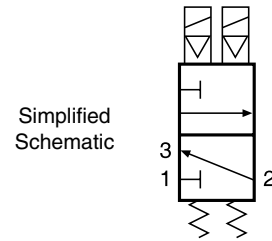
OSHA 29 CFR 1910.147	ISO 14118:2000
CSA Z142-02	EN 1037
CSA Z460-05	ANSI/ASSE Z244.1-2003
ISO 13849-1	ANSI/PMMI B155.1-2006

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DM¹ Series E

Control Reliable Double Valves with Dynamic Monitoring



Port Sizes		Valve Model Number*	Avg. C _v		Dimensions inches (mm)			Weight lb (kg)
In-Out	Exh.		In-Out	Exh.	A	B	C	
1/4	1/2	DM1ENA20**31	1.34	2.43	4.96 (126.1)	10.46 (265.7)	4.87 (123.6)	5.0 (2.27)
3/8	1/2	DM1ENA21**31	1.92	2.43	4.96 (126.1)	10.46 (265.7)	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.

- **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 DM² Series E and DM² 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. Teflon 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 above 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).

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).

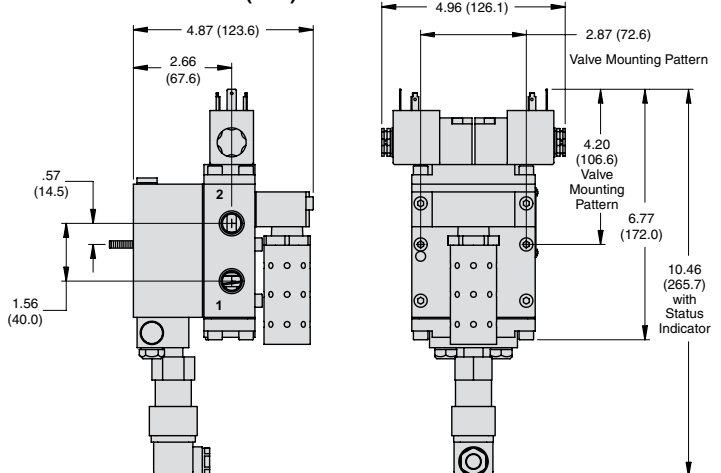
Media Temperature: 40° to 175°F (4° to 80°C).

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)



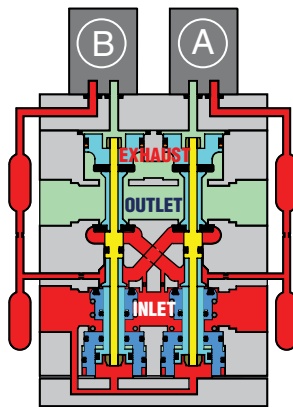
IMPORTANT NOTE: Please read carefully and thoroughly all of the **CAUTIONS** on the inside back cover.



Overview of DM¹ 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.

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.

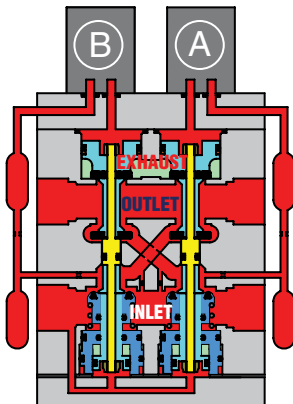
Once the main solenoids are de-energized, actuating pressure is removed from the top of the main pistons and then the lower inlet poppet return spring along with inlet air pressure acting on the side A return piston will push side A back into the de-actuated position. Inlet air pressurizes the crossovers 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.

Valve actuated:

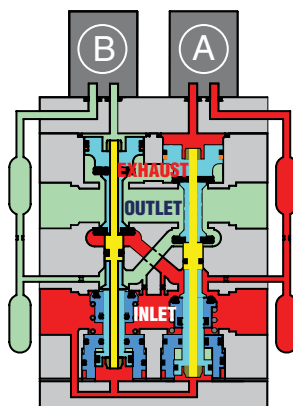
Energizing the pilot solenoids simultaneously applies pressure to both pistons, forcing the internal parts to move to their actuated position, where inlet air flow to outlet is open and both exhaust poppets are closed. The outlet is then quickly pressurized, and pressure in the inlet, crossovers, outlet, 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 actuated.

Asynchronous operation:

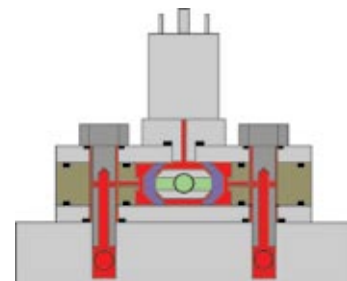
If the valve elements operate in a sufficiently asynchronous manner on ACTUATION, the valve will shift into a position where one crossover and its related timing chambers will be exhausted, and the other crossover and its related timing chambers will be pressurized. In the illustration, side B is in 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.

Status indicator:

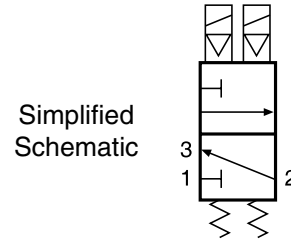
The status indicator pressure switch will actuate when the main valve is operating normally, and will de-actuate when the main valve operation is sufficiently asynchronous or inlet pressure is removed. This device is not part of the valve lockout function, but, rather, only reports the status of the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



Status indicator in normal ready-to-run position.

DM²® Series E

Control Reliable Double Valves with Dynamic Monitoring & Memory



Port Sizes		Valve Model Number*	Avg. C _v		Dimensions inches (mm)			Weight lb (kg)
In-Out	Exh.		In-Out	Exh.	A	B	C	
1/4	1/2	DM2ENA20**21	1.34	2.43	4.96 (126.1)	4.87 (123.6)	10.46 (256.7)	5.6 (2.43)
3/8	1/2	DM2ENA21**21	1.92	2.43	4.96 (126.1)	4.87 (123.6)	10.46 (256.7)	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.

- **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. Teflon 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).

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).

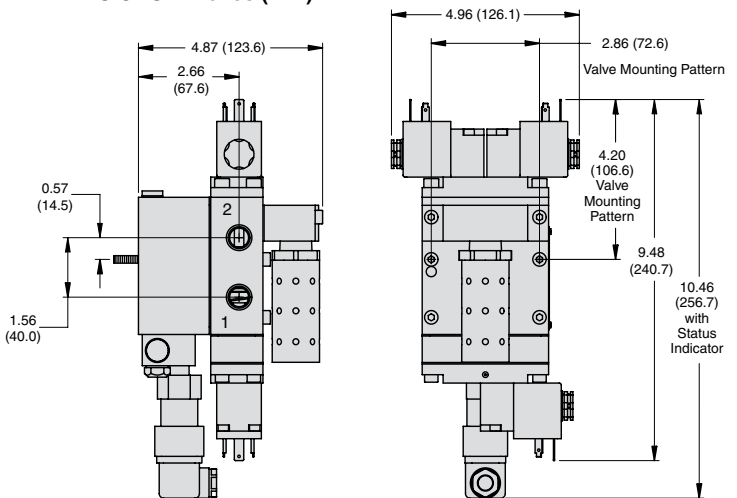
Media Temperature: 40° to 175°F (4° to 80°C).

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)



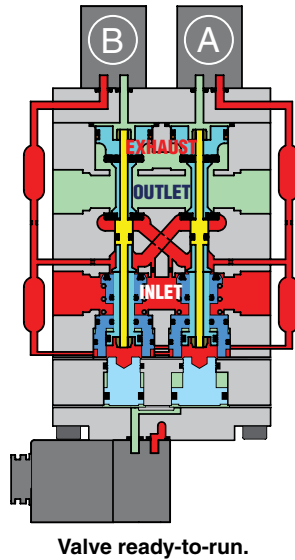
IMPORTANT NOTE: Please read carefully and thoroughly all of the **CAUTIONS** on the inside back cover.



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.)

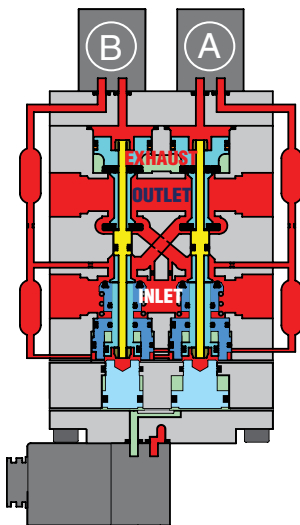
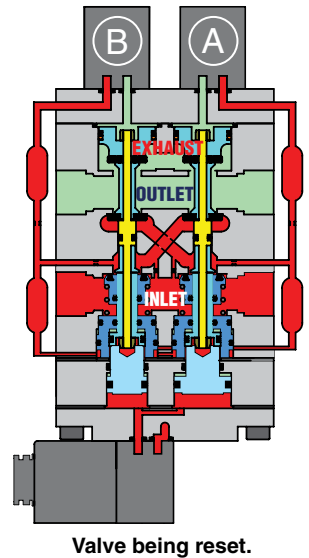


element. Air pressure in the crossover acts on the differential of side A stem diameters creating a latching force.

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.



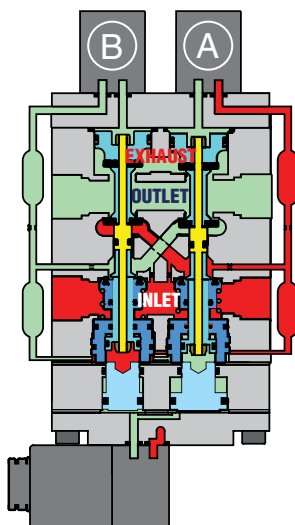
Valve actuated:

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 actuated.

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



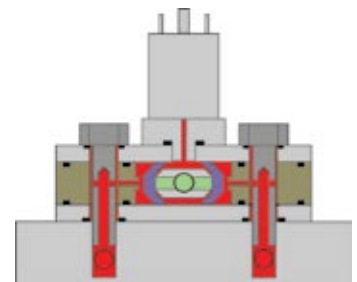
Valve locked-out.

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.



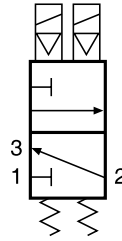
Status indicator in normal ready-to-run position.

DM²® Series C

Control Reliable Double Valves with Dynamic Monitoring & Memory



Simplified Schematic



Valve Size	Port Size In-Out	Valve Model Number*	Avg. C _v	Dimensions inches (mm)			Weight lb (kg)
				A	B	C	
4	1/2 - 1/2	DM2CNA42**21	3	4.34 (110.2)	11.32 (287.5)	6.33 (160.8)	5.9 (2.6)
8	3/4 - 3/4	DM2CNA54**21	4.4	5.41 (137.4)	11.90 (302.3)	7.48 (190.0)	8.4 (3.7)
8	1 - 1	DM2CNA55**21	4.4	5.41 (137.4)	11.90 (302.3)	7.48 (190.0)	8.4 (3.7)
12	1 - 1	DM2CNA66**21	8.5	6.74 (117.2)	13.71 (348.3)	9.42 (239.3)	15.3 (6.7)
30	1½ - 2	DM2CNA88**21	22	9.85 (250.2)	16.26 (413.0)	11.82 (300.3)	34.7 (15.1)

* NPT port threads. For BSP 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.

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. Teflon 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 BSP 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.

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.

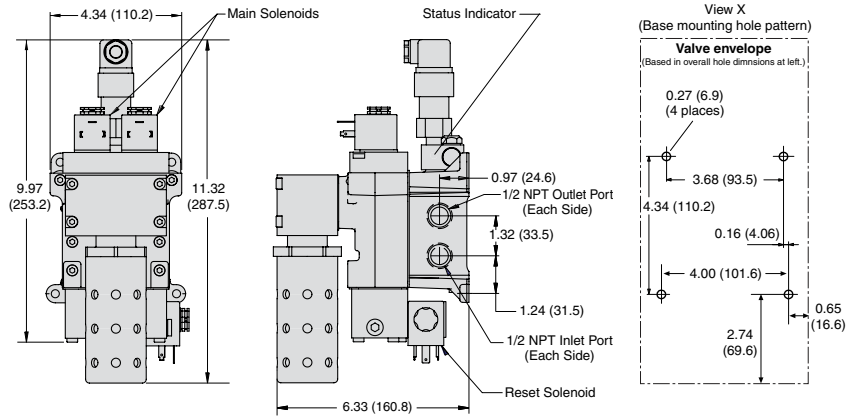
IMPORTANT NOTE: Please read carefully and thoroughly all of the **CAUTIONS** on the inside back cover.



DM²® Series C

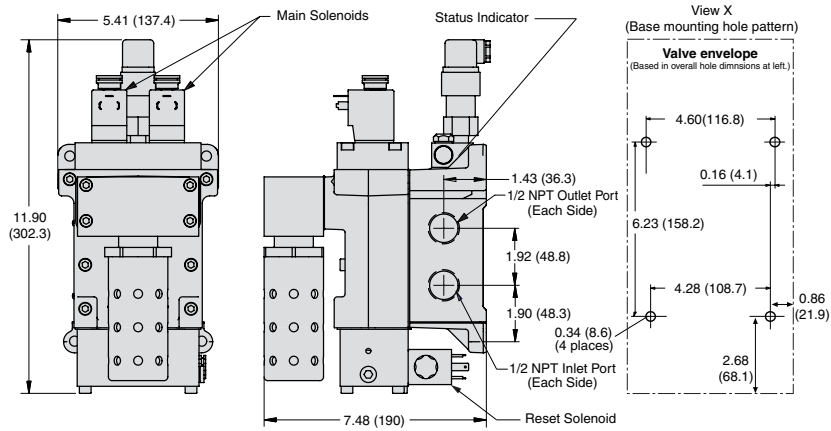
Control Reliable Double Valves with Dynamic Monitoring & Memory

SIZE 4

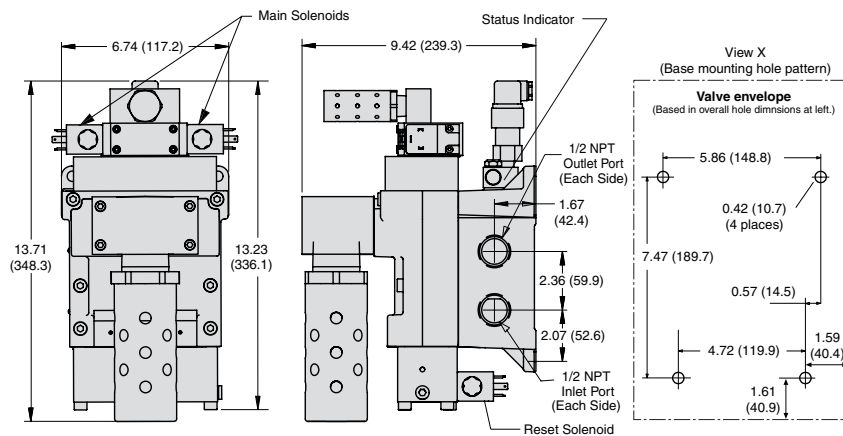


DIMENSIONS – inches (mm)

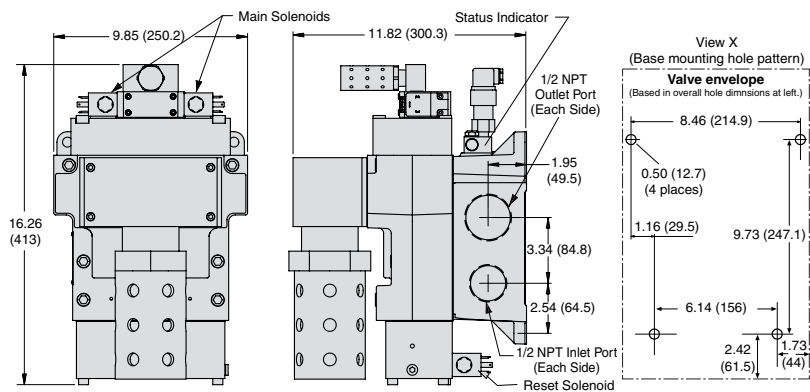
SIZE 8



SIZE 12



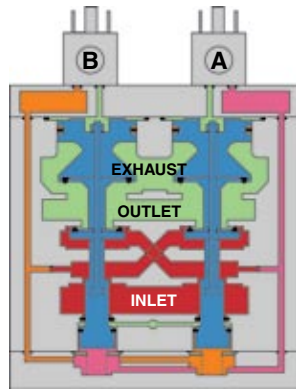
SIZE 30



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.)

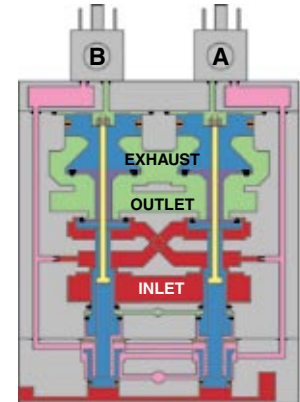


Valve ready to run.

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:

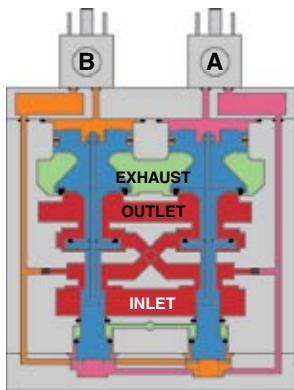
The valve will remain in the locked-out position, even if the inlet air supply is removed and re-applied. A remote reset signal must be applied to reset the valve. Reset is accomplished by momentarily pressurizing the reset port. Actuation of the reset piston physically pushes the main valve elements 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.



Valve being reset.

Valve actuated:

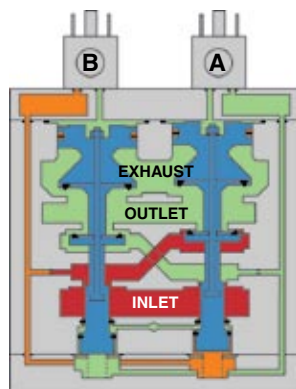
Energizing the pilot valves simultaneously applies pressure to both pistons, forcing the internal parts to move to their actuated (open) position, where inlet air flow to crossover passages is fully open, inlet poppets are fully open and exhaust poppets are fully closed. The outlet is then quickly pressurized, 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.



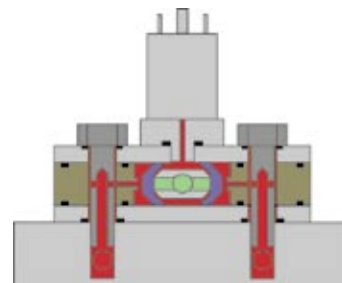
Valve actuated.

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



Valve locked-out.

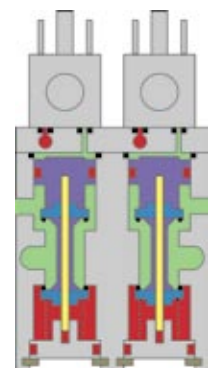


Status indicator (optional) in normal ready to run position.

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.

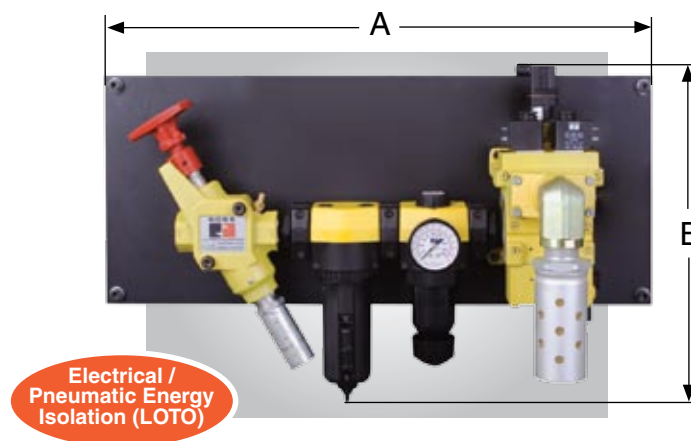


Size 12 & 30 pilots.

Air Entry Packages with Control Reliable Energy Isolation



- 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		C _v 1 to 2	Dimensions (inches/mm)		
		In-Out	Exh.		A	B	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)
RC408-06 ^{EB}	FR	1/2	1	3	24.0 (610)	14.5 (369)	7.4 (187)
RC412-06 ^{EB}	FR	3/4	1	4.4	24.0 (610)	15.7 (399)	8.3 (211)
RC416-06 ^{EB}	FR	1	1	4.4	27.0 (686)	19.0 (483)	9.0 (229)
RC408L-06 ^{EB}	FRL	1/2	1	3	24.0 (610)	14.5 (369)	7.4 (187)
RC412L-06 ^{EB}	FRL	3/4	1	4.4	24.0 (610)	15.7 (399)	8.3 (211)
RC416L-06 ^{EB}	FRL	1	1	4.4	31.0 (788)	19.0 (483)	9.0 (229)

*NPT port threads. Specify voltage and hertz when ordering.
The standard Air Entry Packages are supplied with metal bowl and auto drain.

This system is not designed for controlling clutch/brake mechanisms on mechanical power presses.

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

DM²® Series Double Valves

The ROSS DM²® Series double valves provide new 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 new features also make the valve suitable for use in other Category 3 & 4 safety-related applications.

A ROSS DM²® Series 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 is designed to keep the pressure in the outlet port at less than 1% of inlet pressure. This is an inherent safety characteristic of the ROSS DM²® Series design. Valve element redundancy provides a 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 prevent further valve 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.

Dynamic Monitoring means that all monitoring components change state on every valve cycle. Should the valve elements cycle asynchronously, the valve will lock-out. *Dynamic Memory* is a monitoring system that locks out the valve, to prevent further operation, whenever the valve elements cycle asynchronously either on actuation or de-actuation. The DM²® system can only be reset by a defined operation, and will not self-reset or reset when inlet air supply is removed and re-applied. Such automatic resetting would conceal potential hazards from the operator.

Valve Sizes: DM²® valves are available in 4 sizes, providing a broad range of flow capabilities to meet your needs. For convenience, valves are designated by the nominal sizes 4, 8, 12, and 30 with outlet ports up to 3/4, 1, 1½, and 2 respectively.

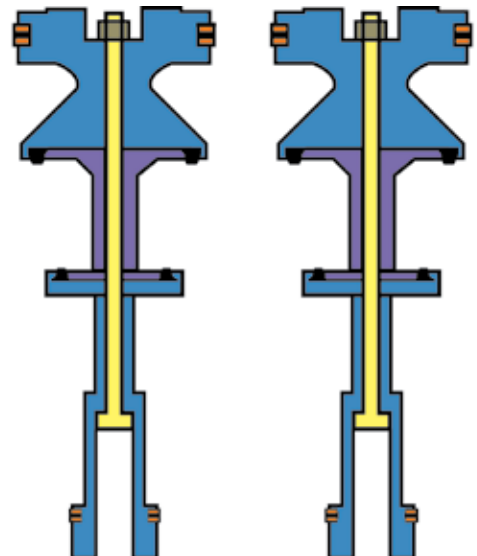
Valve Sizes: The DM²® valves are available in 4 sizes, providing a broad range of flow capabilities to meet your needs. For convenience, valves are designated by the nominal sizes 4, 8, 12, and 30 with outlet ports up to 3/4, 1, 1½, and 2 respectively.

The Leader in Double Valve Design

ROSS has long been in the forefront of double valve research and development. For over 55 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 new DM²® valve combines the monitor and the main valve components into two identical piston-poppet assemblies. Utilizing two piston-poppet assemblies provides a redundant 3/2 normally closed air flow pattern, dynamic monitoring, and dynamic 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.

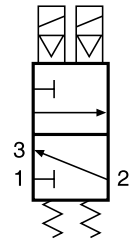




Size 8



Size 30



Simplified Schematic

Size 4, 8, 12 and 30

- **Total 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 or by 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. Teflon 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:** Increase pilot air flow for fast valve response, make it possible to use the same size solenoids as valve sizes 4 & 8, thereby reducing electrical power requirements for these larger valves.

STANDARD SPECIFICATIONS: For DM²® Series D valves.

Solenoids: 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 (three with solenoid reset option).

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 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.

Enclosure rating: IP65, IEC 60529.

Electrical connection: 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: 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 D Double Valves

HOW TO ORDER

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

PRODUCT DM2D D A 4 2 A 1 1 **STATUS INDICATOR**

THREAD BSPP..... D
NPT..... N
N/A (no base)..... X

REVISION LEVEL _____

BASIC SIZE _____

4..... 4
 8..... 5
 12..... 6
 30..... 8

BASE PORT SIZE _____

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
 1 inlet – 1 outlet 6
 1 inlet – 1½ outlet 7

Size 30
 1 inlet – 2 outlet 8

Valve only (less base) X

RESET TYPE
1..... REMOTE
2..... SOLENOID

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

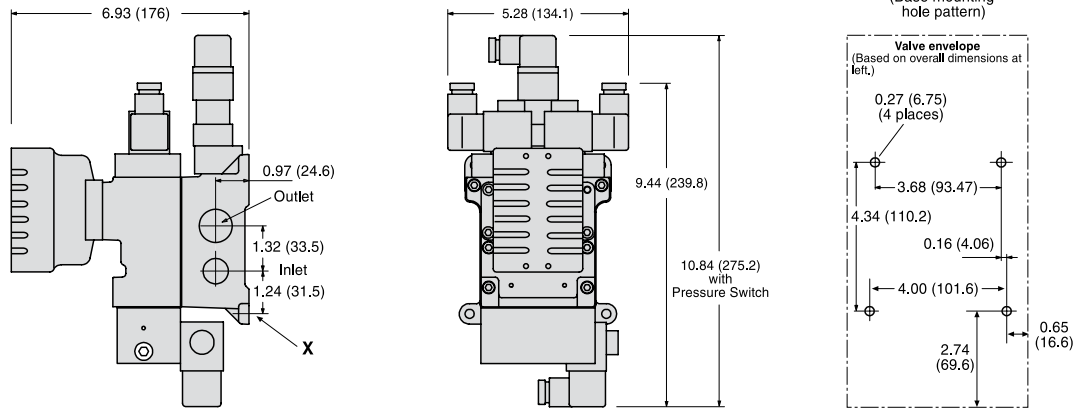
Port Size Inlet	Port Size Outlet	Base Model Number*	Status Indicator	Weight lb (kg)
1/2	1/2	1697C91	No	1.7 (0.8)
1/2	1/2	1698C91	Yes	2.3 (1.1)
1/2	3/4	1699C91	No	1.7 (0.8)
1/2	3/4	1700C91	Yes	2.3 (1.1)
3/4	3/4	1701C91	No	3.6 (1.6)
3/4	3/4	1702C91	Yes	4.2 (1.9)
1	1	1703C91	No	3.6 (1.6)
1	1	1704C91	Yes	4.2 (1.9)
1	1	1705C91	No	6.2 (2.8)
1	1	1706C91	Yes	6.8 (3.1)
1	1½	1707C91	No	6.2 (2.8)
1	1½	1708C91	Yes	6.8 (3.1)
1½	2	1709C91	No	12.0 (5.4)
1½	2	1710C91	Yes	12.6 (5.7)

*NPT port threads. For BSPP threads add a "D" prefix to the model number, e.g. D1700C91.

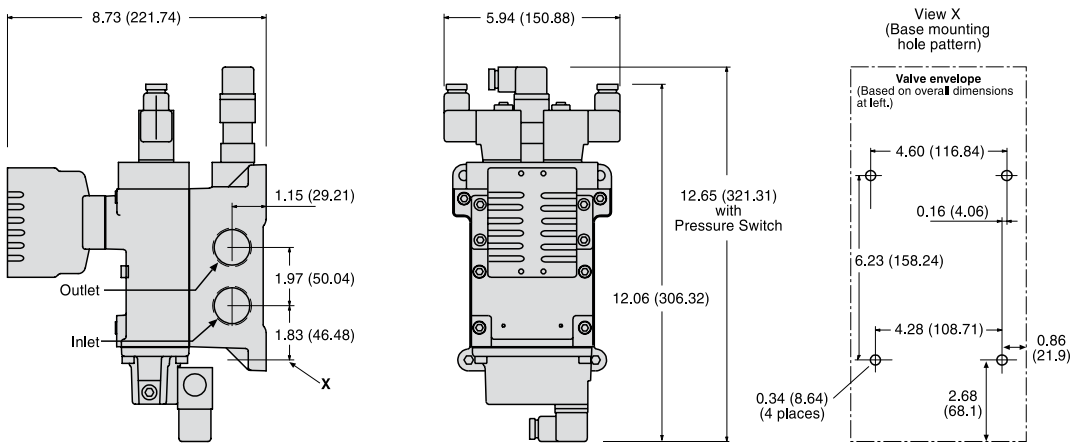
DM²® Series D Double Valves

DIMENSIONS – inches (mm)

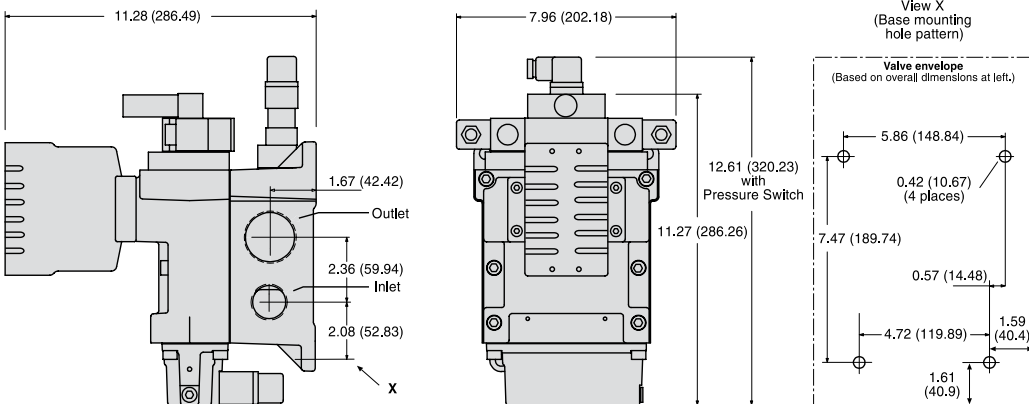
SIZE 4



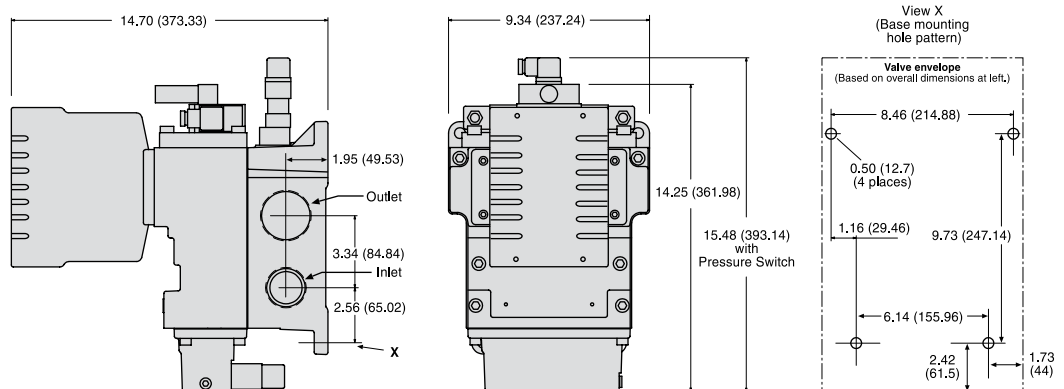
SIZE 8



SIZE 12

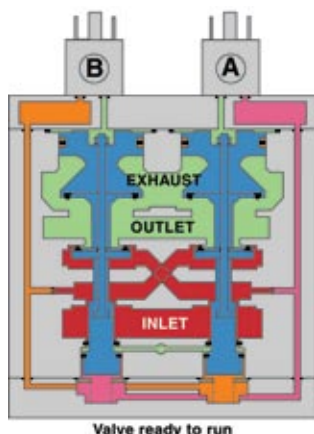


SIZE 30



Overview of DM²® Series D Double Valve Function

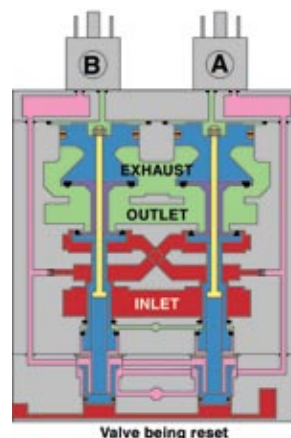
The flow of inlet air pressure into the crossover passages is restricted by the size of the passage between the stem and the valve body opening. Flow is sufficient to quickly pressurize pilot supply/timing chambers A and B. The inlet poppets prevent air flow from crossover passages into the outlet chamber. 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.)



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.

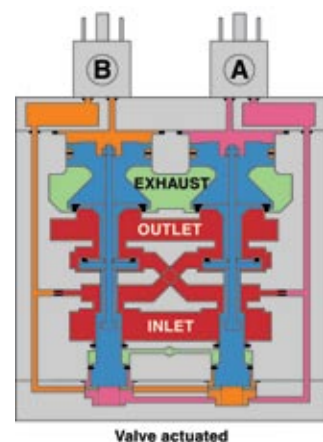
The valve will remain in the locked-out position, even if the inlet air supply is removed and re-applied. A remote reset signal must be applied to reset the valve.



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.)

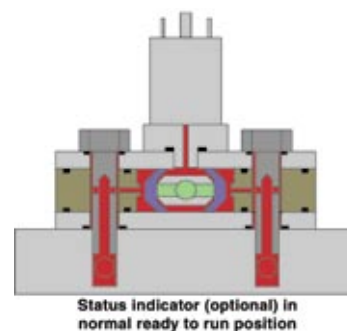
De-actuation of reset pistons causes the reset poppets to close and pilot supply to fully pressurize.

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.



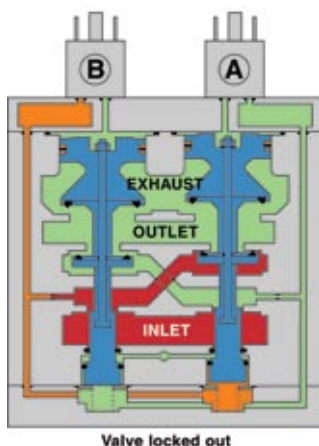
Energizing the pilot valves simultaneously applies pressure to both pistons, forcing the internal parts to move to their actuated (open) position, where inlet air flow to crossover passages is fully open, inlet poppets are fully open and exhaust poppets are fully closed. The outlet is then quickly pressurized, 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.

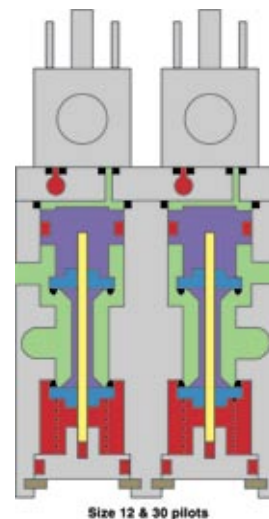


The status indicator pressure switch will actuate when the main valve is operating normally, and will de-actuate when the main valve is in the locked-out position or inlet pressure is removed. This device is not part of the valve lockout function, but, rather, only reports the status of the main valve.

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.



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.



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.

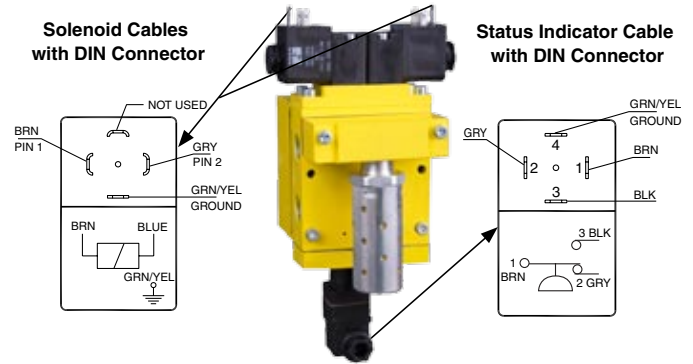
Preassembled Wiring Kits for DM¹ and DM²® Series Double Valves

DM¹ 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 kits include one cable with DIN connector and a cord grip.

Kit Number	Length (meters)
2247H77	5
2248H77	10

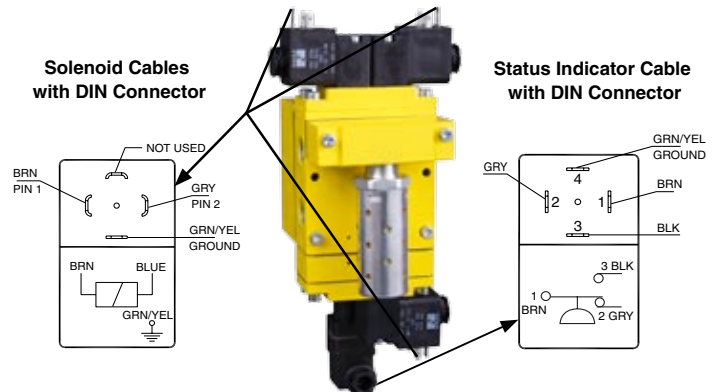
DM²® Series Wiring Kits

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

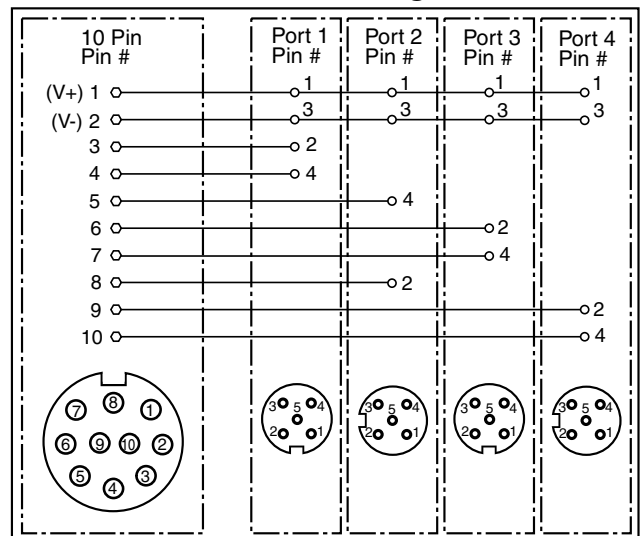


Wiring Kits with J-Box

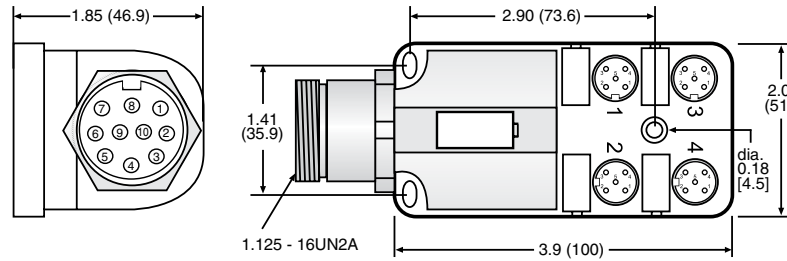
A J-Box is a junction box with a 10-pin MINI connector for connecting to the user's control system and (4) 5-pin M12 ports for connecting to the 3 solenoids and the status indicator on the DM²® Series valve. The J-Box kits include the J-Box as described above and (4) 1-meter cables for connecting to the valve. These cables have a connector on each end. The status indicator cable and the (3) solenoid cables have an M12 connector on one end and a DIN connector on the other end (M12-DIN). Standard valves come with DIN type solenoid connections, but could be bought with M12 type connections as well. Therefore we also offer a kit that provides solenoid cables with an M12 connector on each end (M12-M12).

Kit Number	Solenoid Connector Type	Length (meters)
2249H77	M12 - DIN	1
2250H77	M12 - M12	1

J-Box Wiring



Preassembled Wiring Kits for DM¹ and DM²[®] Series Double Valves



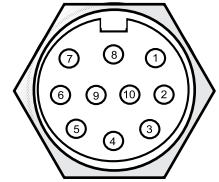
10 PIN MINI Cable

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
2255H77	30
2256H77	50

PIN #	Wire Colors:
1 +24 volts DC	Orange
2 Common volts DC	Blue
3 Solenoid B	White w/Black
4 Solenoid A	Red w/Black
5 Remote Reset	Green w/Black
6 -	Orange w/Black
7 -	Red
8 -	Green/Yellow
9 Remote Valve Fault Light	Black
10 Remote System OK Light	White



Outlet Port Pressure Monitoring Kit

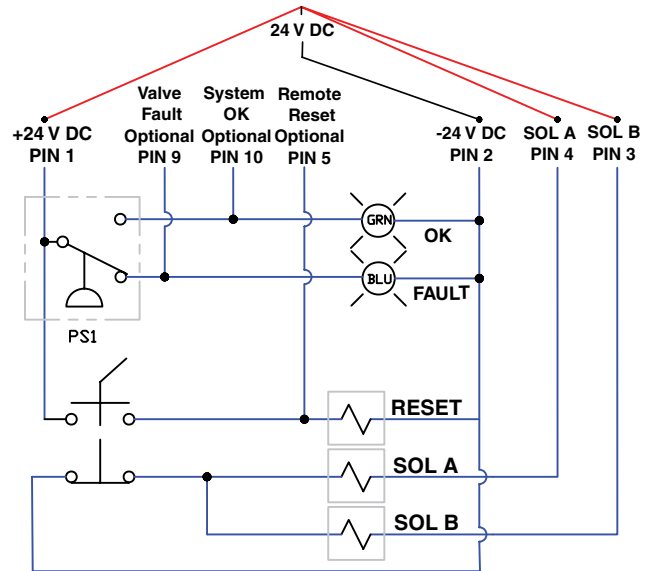
Some customers prefer to monitor downstream pressure in addition to using the or DM¹ Series valve. A convenient way to do this is to install a pressure switch in the extra outlet port that is provided on the valve. The Outlet Port Pressure Monitoring kit can be used with one of the J-Box kits above to split one of the M12 ports on the J-Box so that a pressure switch can be wired in as well. These kits consist of one port splitter (a Tee with three M12 connectors) and one M12-DIN cable (1 meter). A pressure switch is available separately - order part number 586A86.

Kit Number 2251H77

Reset Control Box Kit

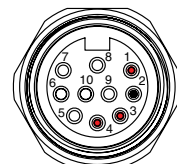
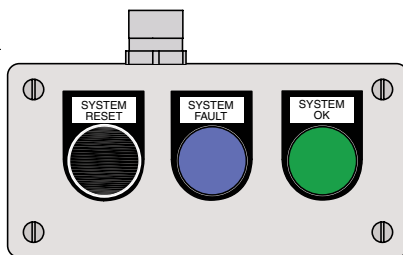
The Reset Control Box makes it easier to incorporate the reset function of DM²[®] Series valves into your controls. The Reset Control box has all the wiring and switches you will need to be able to control the reset solenoid on the DM²[®] Series valve. There is a switch included for momentarily energizing the reset solenoid as well as "fault" and "ready to run" lights. There is also a valve fault output that can be routed back into your control system. Please note that your controls should be setup to provide at least a 250 millisecond delay after the valve status indicator says the valve is ready to run before re-applying power to the pilot solenoids. Also ensure that the reset is not energized simultaneously with the valve solenoid coils; this will result in a fault condition.

Electrical connections to the Reset Control Box from your control system are made through a cable with 10-pin connector (sold separately- see 10 PIN MINI Cable for J-Box).



PIN #	Wire Colors:
1 +24 volts DC	Orange
2 Common volts DC	Blue
3 Solenoid B	White w/Black
4 Solenoid A	Red w/Black
5 Remote Reset	Green w/Black
6 -	Orange w/Black
7 -	Red
8 -	Green/Yellow
9 Remote Valve Fault Light	Black
10 Remote System OK Light	White

Kit Number 2252H77



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 1/4” to 3/4” 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 1/2” 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” - 1 1/2”.



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.

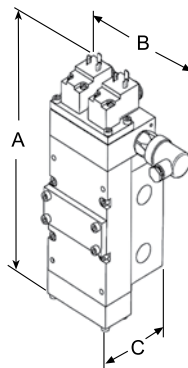
Double Valves with Internal Monitoring & Lockout feature:

- 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.

Series 77 5/2 CROSSMIRROR® Solenoid Pilot Controlled Double Valves



5/2 CROSSMIRROR® double valve with pressure switch



CROSSMIRROR®
5/2 Sizes 2 & 4
are BG Certified

Size 2

Model* Number	Port Sizes		C _v				Pressure Switch	Dimensions inches (mm)			Weight lb (kg)	Replacements*	
	1	2, 3, 4, 5	1-2	1-4	2-3	4-5		A	B	C		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. 7776A3411Z, 7776A3401Z.

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.

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.

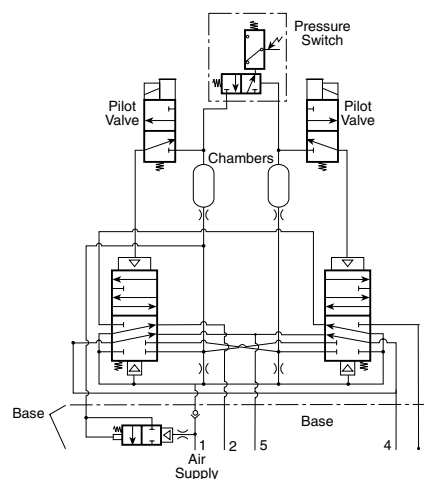
Pressure Switches: Pressure switch provides a signal when valve is in a faulted position.

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 106).

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).

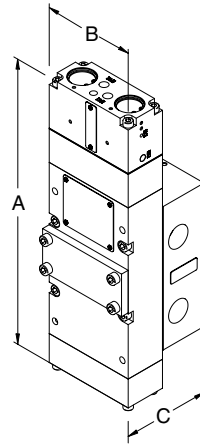
IMPORTANT NOTE

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

Series 77 5/2 CROSSMIRROR® Pressure Controlled Double Valves

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.



5/2 CrossMIRROR®
double valve
Pressure Controlled



Size 2

Model* Number	Port Sizes		C _v				Pressure Switch	Dimensions inches (mm)			Weight lb (kg)	Replacements*	
	1	2, 3, 4, 5	1-2	1-4	2-3	4-5		A	B	C		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 .

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.

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.



Series 77 5/2 CROSSMIRROR® Pressure Controlled Double Valves

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:

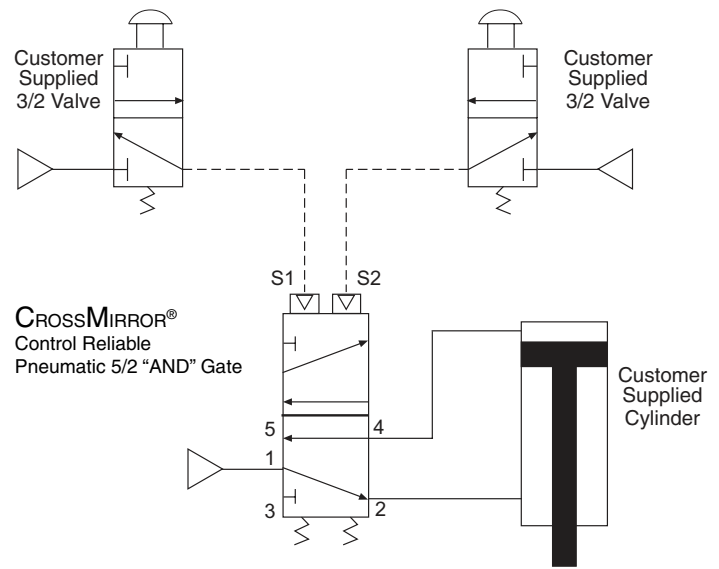
If the two main valve elements are not actuated or de-actuated synchronously, within 500ms, the valve defaults so that outlet port 2 receives full inlet pressure, and outlet port 4 is exhausted through port 5. If this abnormal operation is the result of a temporary circumstance, the valve will be ready 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.

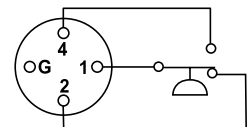
Typical 2-Hand-Anti-Tie-Down Application



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 occurred 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.

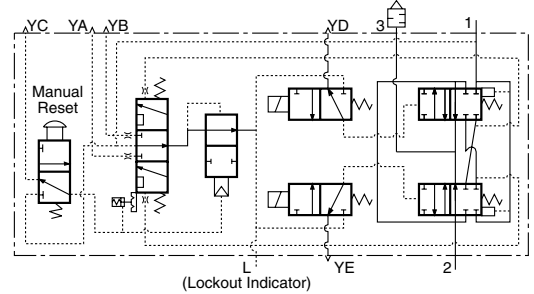
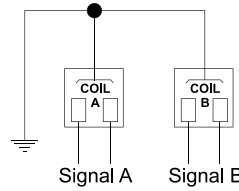
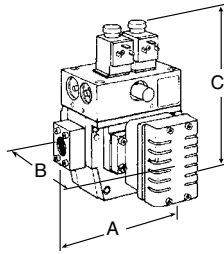
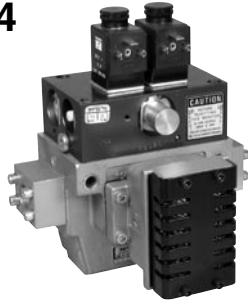
Service Kits

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 DC - 798E30	522E30
4	7786A4400	2217K77	2219K77	1695K77	N/A	N/A	N/A
	7786A4401	2217K77	2219K77	1695K77	1696K77	AC - 518E30 DC - 798E30	522E30

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

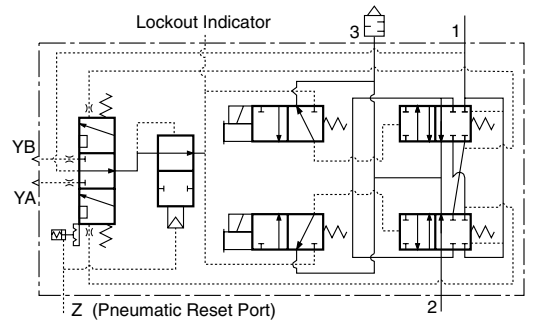
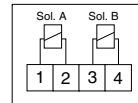
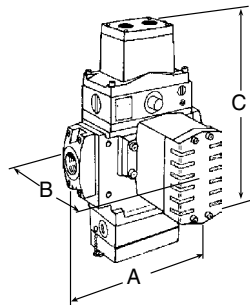
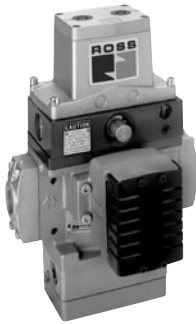
Series 35 SERPAR® Double Valves with L-G Monitor

Size 4



Size	Port Size	Monitor Reset	Valve Model Numbers		Average C_v^*		Dimensions inches (mm)			Weight lb (kg)
			Right Inlet	Left Inlet	In-Out	Out-Exh.	A	B	C	
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



Size	Port Size	Valve Model Numbers		Average C_v		Dimensions inches (mm)			Weight lb (kg)
		w/ Overrides	w/o Overrides	In-Out	Out-Exh.	A	B	C	
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	1 1/4	3573A7162	3573A7182	9.0	21	9.0 (228)	8.5 (216)	13.8 (351)	19.0 (8.6)
30*	1 1/4	3573A7152	3573A7172	20	42	12.4 (314)	11.1 (282)	17.7 (450)	37.5 (16.9)
30*	1 1/2	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 106); 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.

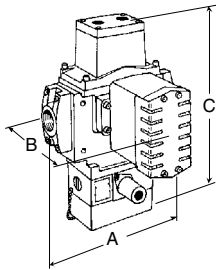
Inlet Port: Models are available with the inlet port on either the right or the left side of the valve body (size 4 only).

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

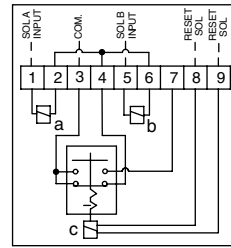


Series 35 SERPAR® Double Valves with E-P Monitor

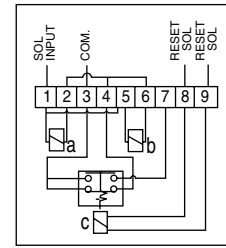
Sizes 8 to 30



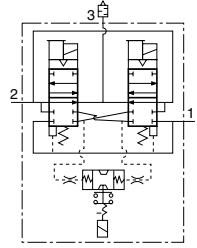
During lock-out:
Terminals 3 and 7
are connected which
allows a panel light,
bell, or other electrical
device to be wired
through terminals 7
and 3 to serve as a
lockout indicator.



Dual Input Wiring Diagram



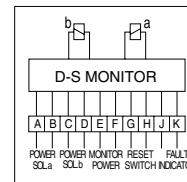
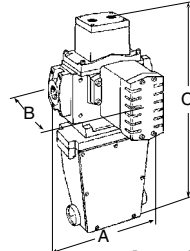
Single Input Wiring Diagram



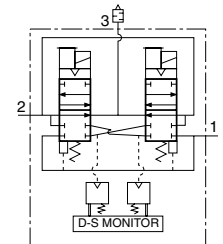
Size	Port Size	Valve Model Number		Avg. C _v		Dimensions inches (mm)			Weight lb (kg)		
		Single Signal Input w/ Overrides	Single Signal Input w/o Overrides	Dual Signal Input w/ Overrides	Dual Signal Input w/o Overrides	In-Out	Out-Exh	A		B	C
8	1/2	3573A4141	3573A4161	3573A4341	3753A4361	3.5	8.5	8.5 (216)	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)

Series 35 SERPAR® Double Valves with D-S Monitor

Sizes 8 to 30



Wiring Diagram



Size	Port Size	Valve Model Number		Avg. C _v		Dimensions inches (mm)			Weight lb (kg)
		w/ Overrides	w/o Overrides	In-Out	Out-Exh.	A	B	C	
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.

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).

E-P Reset Solenoid: Rated for *intermittent* duty.

Voltages: 24-48 or 100-120 volts AC or DC (for E-P only).

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

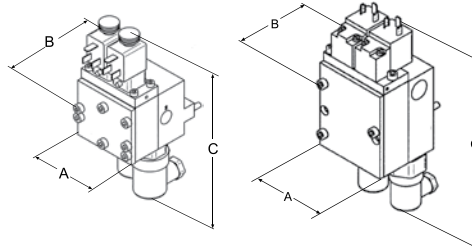
Please read carefully and thoroughly all of the **CAUTIONS** on the inside back cover.

Series 35 Crossflow™ Double Valves*

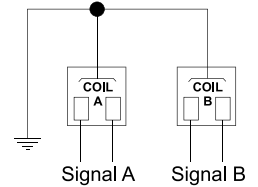
Size 1 & 2



Crossflow™ Size 1 Crossflow™ Size 2



* Non-monitored



Valve Assembly		Avg. C _v		Pressure Switches**	Press. Switch Provision	Port Sizes		Dimensions inches (mm)			Avg. Response Constants			
Valve Size	Model Number*	1-2	2-3			1 & 2	3	A	B	C	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:

$$\text{Vlv. Resp. Time (msec)} = M + F * V$$

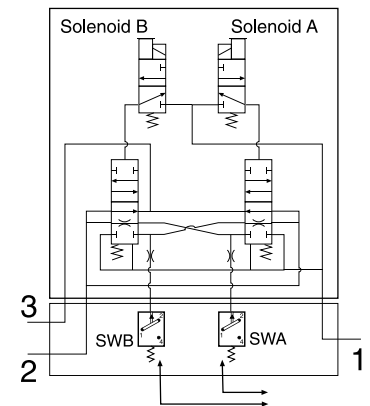
M= avg. time for parts movement

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.

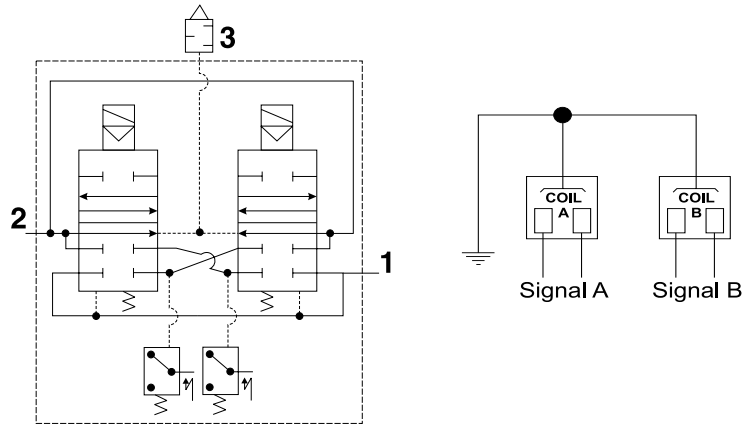
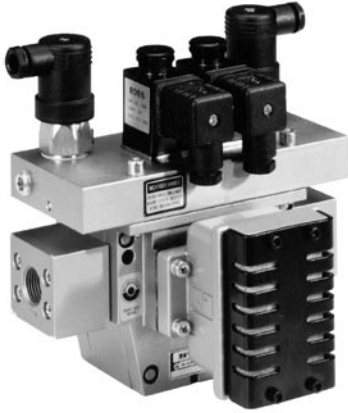
IMPORTANT NOTE

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



Series 35 Crossflow™ Double Valves with Pressure Switches*

Size 4 – Series 3500



* 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 and associated machinery in the event of a failure within the valve.

Valve Size	Port Size	Model Number*		Standard Flow SCFM/Min (l/sec.)	Weight lb (kg)
		Inlet Right Flanged Ports	Inlet Left Flanged Ports		
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.

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: Each solenoid, 35 VA maximum in-rush, 22 VA holding on 50 or 60 Hz; 14 watts nominal on DC.

Electrical Connections: Uses cord-grip connectors at solenoids. Order connectors separately (see page 106).

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: 40 to 150 psig (2.5 to 10 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.

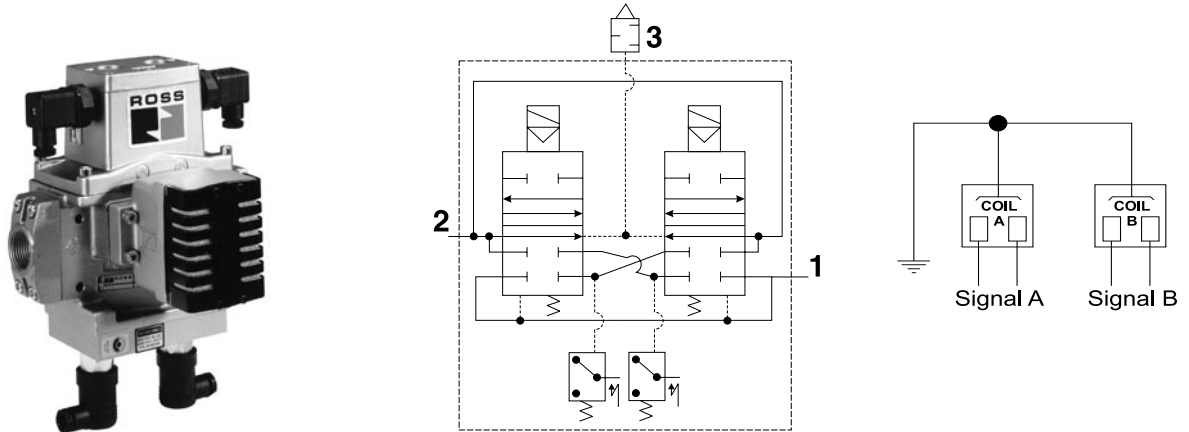
CAUTION: If the system must be reset, electrical signals to both solenoids must be removed to prevent the machine from immediately recycling and producing a potentially hazardous condition.

IMPORTANT NOTE

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

Series 35 Crossflow™ Double Valves with Pressure Switches*

Sizes 8, 12, 30 – Series 3500



* 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.

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	1 1/4	3573B7632	297 (140)	11.4 (5.2)
30	1 1/4	3573B7630	1,800 (850)	33.9 (15.4)
30	1 1/2	3573B8630	1,800 (850)	33.9 (15.4)

*NPT port threads. For BSPP threads, order base with a "D" prefix.

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: 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 106).

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.

Pressure Range: 2 to 8.5 bar.

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.



Energy Release Verification Options

Visual Pop-Up Indicator or Pressure Switch (electrical)

- May be installed on all L-O-X® and manual L-O-X® with EEZ-ON® operation valves 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.

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**.

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.

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.

Part Numbers of Electrical Connectors

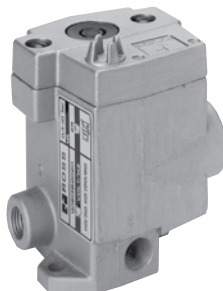
Connector Type	Without Light	With Light*
For use with dropcord (Cord not included)	937K87	936K87*
Wired with 6-mm cord	721K77	720K77*
Wired with 10-mm cord	371K77	383K77*
For use with threaded conduit	723K77	724K77*

Direct Solenoid Model for Line Mounting: 1613B1020*



Pushbutton Models

Green button: 1223A1005



* Specify solenoid voltage and Hz when ordering.

Direct Solenoid Model for Base Mounting

Valve: W1413A1409*
Sub-Base: 516B91



MODEL NUMBER INDEX (cont'd)

Model Number	Page	Model Number	Page	Model Number	Page	Model Number	Page	Model Number	Page	Model Number	Page
W7056A8331	27	W7076C6331	26	W7077D4331	26	W7456C4332	29	W7476C4331	28	Y1523C9012	59
W7056A8332	27	W7076C6332	26	W7077D4332	26	W7456C4336	29	W7476C4332	28	Y2773A3072	61
W7056B4331	27	W7076C8331	26	W7456A2331	29	W7456C4337	29	W7476B4336	28	Y2773A3072	61
W7056B4332	27	W7076C8332	26	W7456A2332	29	W7476A2331	28	W7476C4337	28	Y2773A4072	61
W7057A2331	27	W7076D4331	26	W7456A2336	29	W7476A2332	28	Y1523B3102	66	Y2773A4082	61
W7057A2332	27	W7076D4332	26	W7456A2337	29	W7476A2333	28	Y1523B4102	66	Y2773A5072	61
W7057A3331	27	W7077A2331	26	W7456A3331	29	W7476A2337	28	Y1523B5112	66	Y2773A6072	61
W7057A3332	27	W7077A2332	26	W7456A3332	29	W7476A3331	28	Y1523B5102	66	Y2773A6082	61
W7057A6331	27	W7077A2906	26	W7456A3336	29	W7476A3332	28	Y1523B6102	66	Y2773A7072	61
W7057A6332	27	W7077A3331	26	W7456A3337	29	W7476A3333	28	Y1523B7112	66	Y2773A8072	61
W7057A6902	27	W7077A3332	26	W7456A6331	29	W7476A3337	28	Y1523C2002	59	Y2773A8082	61
W7057A8331	27	W7077A3904	26	W7456A6332	29	W7476A6331	28	Y1523C3012	59	Y2773A9072	61
W7057A8332	27	W7077A6920	26	W7456A6336	29	W7476A6332	28	Y1523C3002	59	Y2773A9082	61
W7057B4331	27	W7077A8901	26	W7456A6337	29	W7476A6336	28	Y1523C4002	59	Y2773B5037	56
W7057B4332	27	W7077C4939	26	W7456A8331	29	W7476A6337	28	Y1523C5002	59	Y2773B6047	56
W7076A2331	26	W7077C6331	26	W7456A8332	29	W7476A8331	28	Y1523C5012	59	Y2783A8006	61
W7076A2332	26	W7077C6332	26	W7456A8336	26	W7476A8332	28	Y1523C6002	59	Y2783A9006	61
W7076A3331	26	W7077C8331	26	W7456A8337	26	W7476A8336	28	Y1523C7012	59	Y2783A9016	61
W7076A3332	26	W7077C8332	26	W7456C4331	29	W7476A8337	28	Y1523C8002	59		

New ROSS Products

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.

For more information on Dale Series valves please visit the ROSS website at www.rosscontrols.com to view the complete downloadable literature, the new product information sheets form numbers **NPS017, NPS018, NPS019 and NPS020**.

New Product Information

Dale Series CP, CX Compact Poppet Valves
R & L Wing
Normally Closed



STANDARD SPECIFICATIONS:
 Port Sizes: 1/8", 1/4", 3/8", 1/2", 3/4", 1" (NPT)
 Pressure: 150 psig (10 bar) (max)
 Temperature: -40 to 150 °C (-40 to 300 °F)
 Materials: Brass, Stainless Steel, Aluminum
 Seal: Viton, Nitrile, PTFE
 Mounting: Panel Mount, In-Line
 Part Thread: NPT standard, BSP

GENERAL:
 The Dale Series CP, CX is a high flow, compact design poppet valve. It is available in normally closed (NC) or normally open (NO) configurations. The valve is designed for applications requiring port pressure independence. The valve is available in a wide range of port sizes and materials. The valve is designed for applications requiring port pressure independence.

FEATURES:
 • High flow, compact design
 • Port pressure independence
 • Available in a wide range of port sizes and materials
 • Designed for applications requiring port pressure independence

APPLICATIONS:
 • Vacuum applications
 • Leak test applications
 • Industrial process control

Note: For full applications, consult ROSS.

New Product Information

Dale Series CP, CX Compact Poppet Valves Manifold
R & L Wing
Normally Closed



STANDARD SPECIFICATIONS:
 Port Sizes: 1/8", 1/4", 3/8", 1/2", 3/4", 1" (NPT)
 Pressure: 150 psig (10 bar) (max)
 Temperature: -40 to 150 °C (-40 to 300 °F)
 Materials: Brass, Stainless Steel, Aluminum
 Seal: Viton, Nitrile, PTFE
 Mounting: Panel Mount, In-Line
 Part Thread: NPT standard, BSP

GENERAL:
 The Dale Series CP, CX is a high flow, compact design poppet valve manifold. It is available in normally closed (NC) or normally open (NO) configurations. The manifold is designed for applications requiring port pressure independence. The manifold is available in a wide range of port sizes and materials. The manifold is designed for applications requiring port pressure independence.

FEATURES:
 • High flow, compact design
 • Port pressure independence
 • Available in a wide range of port sizes and materials
 • Designed for applications requiring port pressure independence

APPLICATIONS:
 • Vacuum applications
 • Leak test applications
 • Industrial process control

Note: For full applications, consult ROSS.

New Product Information

Dale Series LF, LX Inline Valves
R Wing
Normally Closed



STANDARD SPECIFICATIONS:
 Port Sizes: 1/8", 1/4", 3/8", 1/2", 3/4", 1" (NPT)
 Pressure: 150 psig (10 bar) (max)
 Temperature: -40 to 150 °C (-40 to 300 °F)
 Materials: Brass, Stainless Steel, Aluminum
 Seal: Viton, Nitrile, PTFE
 Mounting: Panel Mount, In-Line
 Part Thread: NPT standard, BSP

GENERAL:
 The Dale Series LF, LX is a high flow, compact design inline valve. It is available in normally closed (NC) or normally open (NO) configurations. The valve is designed for applications requiring port pressure independence. The valve is available in a wide range of port sizes and materials. The valve is designed for applications requiring port pressure independence.


FEATURES:
 • High flow, compact design
 • Port pressure independence
 • Available in a wide range of port sizes and materials
 • Designed for applications requiring port pressure independence

APPLICATIONS:
 • Vacuum applications
 • Leak test applications
 • Industrial process control

Note: For full applications, consult ROSS.

New Product Information

Dale Series LT Leak Test Valves & Manifolds
R & L Wing
Normally Closed



STANDARD SPECIFICATIONS:
 Port Sizes: 1/8", 1/4", 3/8", 1/2", 3/4", 1" (NPT)
 Pressure: 150 psig (10 bar) (max)
 Temperature: -40 to 150 °C (-40 to 300 °F)
 Materials: Brass, Stainless Steel, Aluminum
 Seal: Viton, Nitrile, PTFE
 Mounting: Panel Mount, In-Line
 Part Thread: NPT standard, BSP

GENERAL:
 The Dale Series LT is a high flow, compact design leak test valve/manifold. It is available in normally closed (NC) or normally open (NO) configurations. The valve/manifold is designed for applications requiring port pressure independence. The valve/manifold is available in a wide range of port sizes and materials. The valve/manifold is designed for applications requiring port pressure independence.

FEATURES:
 • High flow, compact design
 • Port pressure independence
 • Available in a wide range of port sizes and materials
 • Designed for applications requiring port pressure independence

APPLICATIONS:
 • Vacuum applications
 • Leak test applications
 • Industrial process control

Note: For full applications, consult ROSS.

Additional ROSS Literature

Bulletin Number (If Applicable)	Description	Form Number
440	ROSS Valves for Vacuum Service	A10122
600	ROSS ISO Valves and Serial Bus Communication	A10309
450	Modular Press Solutions	A10155
462	Modular Pneumatic Solutions	A10181
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
420B	Filters, Pressure Regulators, Lubricators, Silencers, and Reclassifiers - Including MD4™ Series	A10120
490	Fluid Power Safety Overview	A10276

To order any of the catalogs listed above, contact ROSS or your local ROSS distributor. The above catalogs can also be downloaded in PDF format at www.rosscontrols.com.



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. See *Ordering Information* below for prefix letters.

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.

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.

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 phone number on back cover).

Ordering Information

Voltage & Hertz

When ordering a solenoid valve, also specify the desired solenoid voltage and hertz. (See Recommended Solenoid Voltages above.) For example:

- Model 2773B5001, 120 volts, 60 Hz.
- Model W6076B2401, 220 volts, 50 Hz.

Order Placement

For order placement, consult ROSS or your local ROSS distributor on the back cover of this catalog.

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.

Warranty

Products manufactured by ROSS are warranted to be free of defects in material and workmanship for a period of one year from the date of purchase. 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 such product is found to be defective. This warranty shall be void in the event that product has been subject to misuse, misapplication, improper maintenance, modification or tampering. THE WARRANTY EXPRESSED ABOVE IS IN LIEU OF AND EXCLUSIVE OF ALL OTHER WARRANTIES AND ROSS EXPRESSLY DISCLAIMS ALL OTHER WARRANTIES EITHER EXPRESSED OR IMPLIED WITH RESPECT TO MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. ROSS MAKES NO WARRANTY WITH RESPECT TO ITS PRODUCTS MEETING THE PROVISIONS OF ANY GOVERNMENTAL OCCUPATIONAL SAFETY AND/OR HEALTH LAWS OR REGULATIONS. IN NO EVENT SHALL ROSS BE LIABLE TO PURCHASER, USER, THEIR EMPLOYEES OR OTHERS FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES WHICH MAY RESULT FROM A BREACH OF THE WARRANTY DESCRIBED ABOVE OR THE USE OR MISUSE OF THE PRODUCTS. NO STATEMENT OF ANY REPRESENTATIVE OR EMPLOYEE OF ROSS SHALL EXTEND THE LIABILITY OF ROSS AS SET FORTH HEREIN.

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.

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. 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 base 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 and/or human injury. If you have questions regarding whether a lubricant used on your system is compatible with ROSS products, please contact ROSS.

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 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 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 manual **L-O-X**® with **EEZ-ON**® operation products are defined as energy isolation devices, NOT AS EMERGENCY STOP DEVICES.





GLOBAL Reach with a LOCAL TouchSM

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Your local ROSS distributor is:

There are ROSS Distributors Throughout the World

To meet your requirements across the globe, ROSS distributors are located throughout the world. Through ROSS or its distributors, guidance is available for the selection of ROSS products, both for those using pneumatic components for the first time and those designing complex pneumatic systems.

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.