BULLETIN 104G

ROSS® FLUID POWER PRODUCTS

Contents

This catalog represents an overview of ROSS' extensive product line. If you need products or specifications not shown within this catalog, please contact your local ROSS distributor or call ROSS for more information.

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 ROSS' spirit of ingenuity and appreciation for state-of-the-art designs still flows through its corporate culture. ROSS' 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 its customers as they "pull" ROSS into new fluid power applications. With its unique customer-driven ROSS/FLEX® development process, ROSS is revolutionizing the fluid power industry.

ROSS Controls® is an international company. Its 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 Japan, the United States, the United Kingdom, Germany, Brazil, France, China, and India, 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!

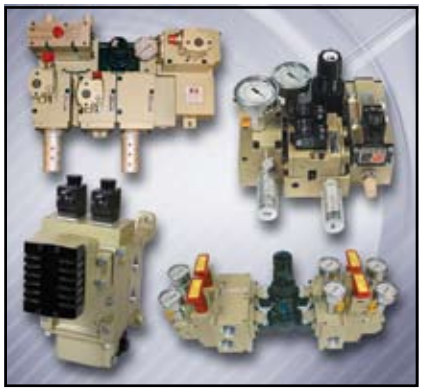
Industry Solutions

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.

Glass Bottle Machines

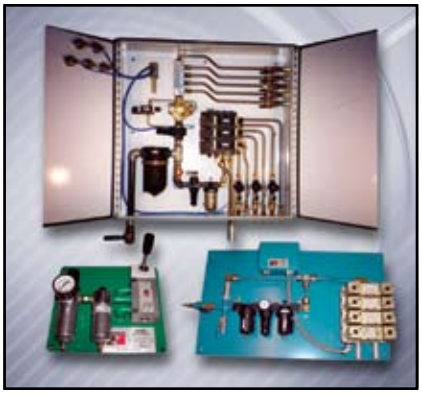
- Valves designed for repeatability
- Counterblow vacuum valves
- Hi/low pressure valves
- Plunger up/down & cooling valves
- Blowhead on/off valve including kickoff
- Mold open/close valves
- Pusher valves
- Blow mold vacuum valves
- Final blow Slimline™ valves with quick exhaust or pressure booster options
- All designed for high temperature service
- Blow pistol valve
- Proportional valves for plunger and blowing functions
- Unbeatable poppet technology for high shift consistency
- Systems, circuits & products which substantially reduce piping, fittings, maintenance, downtime, labor cost, & compressed air usage
- For details, request ROSS literature form number A10132A

Metal Forming Products



- Automatic counterbalance pressure controller
- Pneumatic double valves for clutch/brake control
- Soft clutch and soft brake modules
- Modular press solutions
- Custom pneumatic manifolds
- Air distribution manifolds
- Automation manifolds
- Die clamp manifolds
- Die cushion manifolds
- Lock-out valve manifolds
- Main air filter and lock-out devices
- Efficiently designed systems to eliminate piping & fittings, ease installation, reduce procurement costs, simplify troubleshooting, save energy, reduce downtime, improve appearance & consolidate space
- For details, request Bulletin 450 (ROSS literature form number A10155), Bulletin 380B (ROSS literature form number A10091), & Bulletin 505 (ROSS literature form number A10295)

Steel Industry Products



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

Industry Solutions

Safety Products

- Control-reliable 3/2 and 5/2 pneumatic valves with BG Certification
- Pneumatic internally monitored double valves for safety applications
- HOZE-FUZE™ to prevent hose whip
- Pilot operated check valves (single/double channel sensing available)
- Check valves
- Silencers & reclassifiers
- EEZ-ON® valves for gradual start-up
- Manual and solenoid L-O-X® valves for energy isolation
- L-O-X®/EEZ-ON® combination valves
- Two-hand anti-tie-down controls
- Pneumatic double valves for integration with external monitoring systems
- Lock-out verification accessories
- Spring locked & detented hand valves
- Guarded foot pedal valves
- Monitored in-line valves
- For details, request ROSS literature form number A10259A

Aluminum Reduction

- ENERGYSAVER® crust breaker valves
- Point breaker, ore feed & bar breaker cylinders
- Breaker & ore feed valves
- Anode jacking
- Door opening
- Overhead crane
- Complete cylinder & valve packages
- Specialized low wear body coating throughout
- For details, request ROSS literature form number A10191A

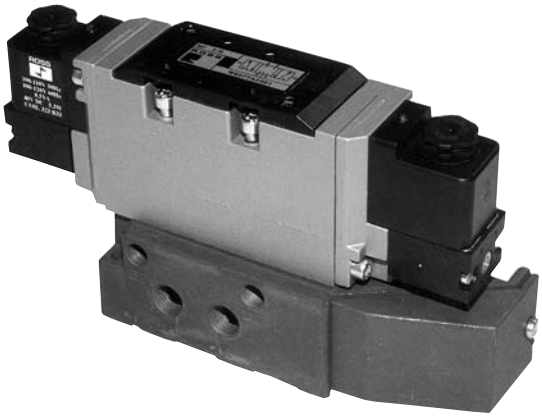
General Automation Products

- Line-mounted valves
- ISO, ANSI, SAE base mounted valves
- Flow control valves
- Check valves
- EEZ-ON® valves
- L-O-X® valves
- Pendant control valves
- Rodless cylinders
- Electronic proportional regulators
- Piezo piloted proportional regulators, highly compact with low power demand for use in hazardous environments
- Filters, regulators and lubricators
- Mechanical valves
- Silencers
- Pilot operated valves
- High-flow reverse flow regulators
- Serial BUS systems
- Pneumatic relief valves
- Pilot operated check valves
- Obstruction sensing systems
- Vacuum valves
- Right angle PO checks, EEZ-ON® valves, & regulators
- Foot & hand valves
- High capacity water & particulate filters
- Visit www.rosscontrols.com/rosslit.htm to download our literature in PDF format

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 1 1/2", 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

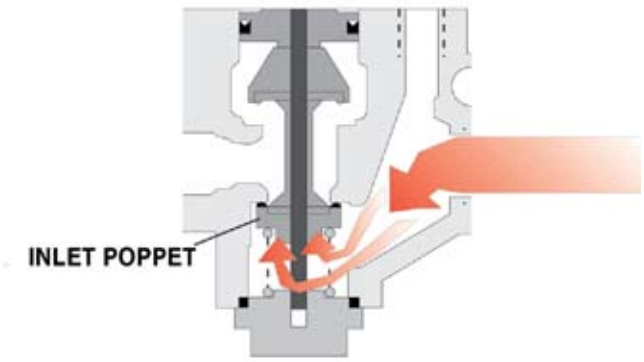
1. Low weight; compact size.
2. **LOGICAIR**® adaptors provide special functions —
   - Timed sequence actuation and/or deactuation
   - Momentary control of actuation/deactuation from one pressure source
   - Actuating force multiplier, for use with low signal pressures
3. Available with choices of 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 2 1/2"; 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

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

Positive Sealing

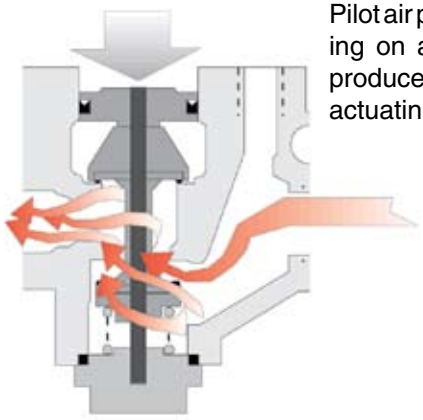
Inlet air pressure forces the inlet poppet upward, pushing the poppet seal firmly against the seat. The higher the inlet pressure, the greater the sealing force. Note that the seal is engaged perpendicular to the seat; there is no sliding action to damage and wear the seal.



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.

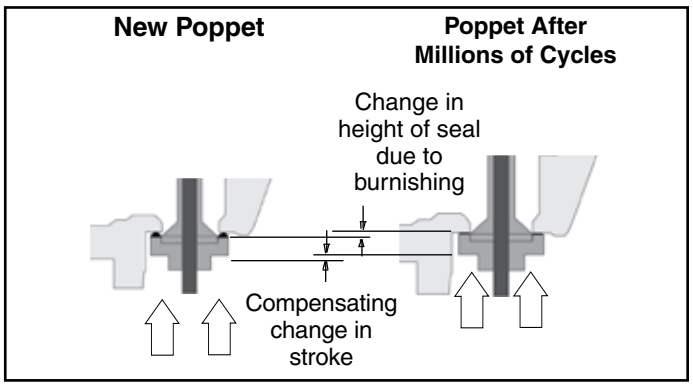
In poppet valves, the smallest flow-through area is across the poppet's seal and seat. This produces a very high velocity which blows all dirt and foreign matter out of the seat area for a virtually leak-proof seal.



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

Self-Compensating for Wear

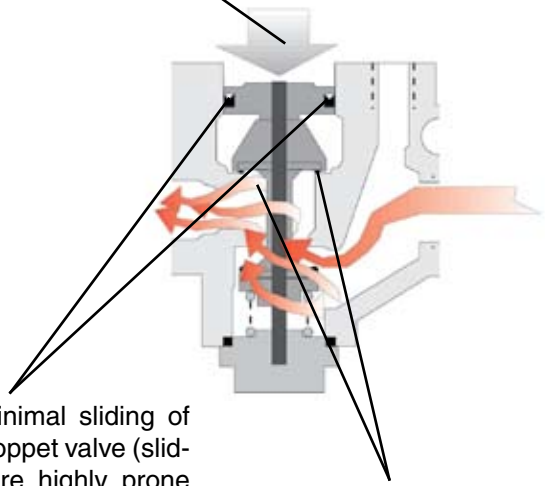
Because of its superior design, any change in the height of the valve seal (due to burnishing) is automatically compensated for by an equal change in the length of stroke. Therefore, the sealing force remains constant over the entire life of the valve.



Repeatability Over the Life of the Valve

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

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



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.

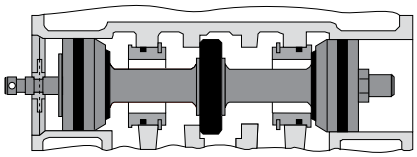
When pilot air is exhausted, the inlet pressure produces an extremely strong upward force, reliably shifting the valve to a closed position.

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

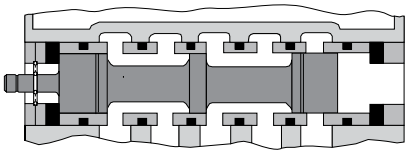


BENEFITS
- Very dependable
- Tolerant of dirty air
- Positive seating
- Fast response
- Long service life
- Low maintenance
- Repeatability

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

Internal pressure works equally on each spool area, establishing a balance between forces attempting to move the spool right or left. Inlet pressure or back pressure may be applied to one or more ports without affecting this balance.

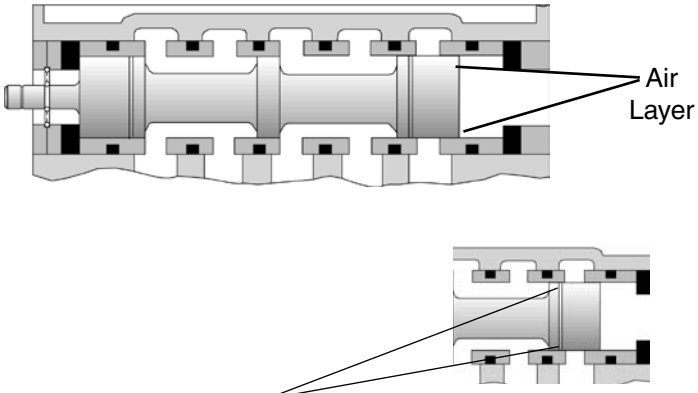
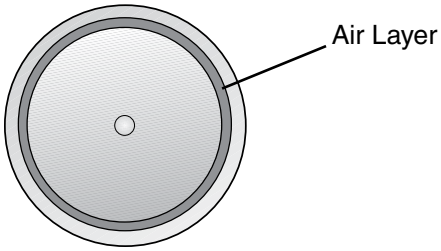


Illustration of micro air-bearing concept

Low-friction Spool

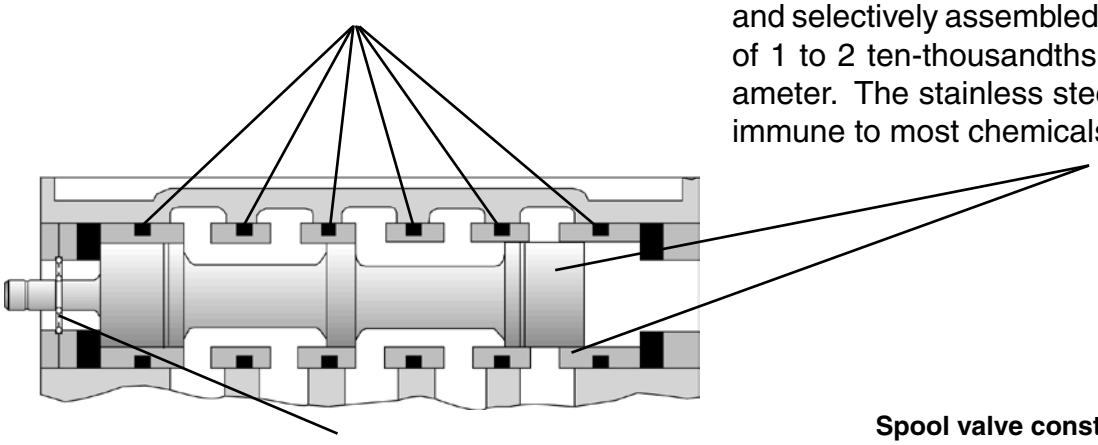
The spool is separated from, and actually floating within, the sleeve. The thin film of air creates an air bearing which virtually eliminates sliding friction between the spool and sleeve during shifting.



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

Other Significant Features

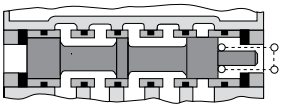
"O" rings isolate the precision steel sleeve from valve bod and mounting torque distortions. O-rings are static and are not subject to dynamic wear.



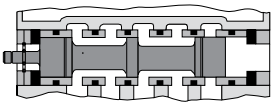
The stainless steel spool and sleeve are matched and selectively assembled to maintain a clearance of 1 to 2 ten-thousandths of an inch over the diameter. The stainless steel components are also immune to most chemicals.

In spool and sleeve valves there is no imbalance of air pressures to maintain the spool in its last position. A mechanical detent is built into all ROSS 2-position spools to ensure that they maintain the intended position.

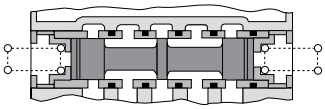
Spool valve construction can be made in 2 and 3 position functions.



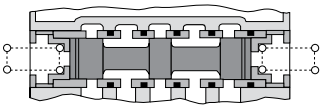
Single Control (2 position)



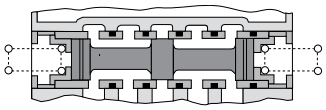
Double Momentary [Impulse] Control (2 position)



Power Center Double Control (3 position)



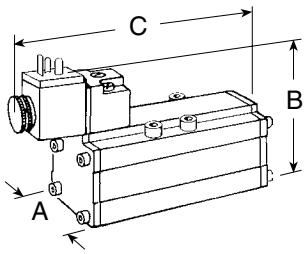
Closed Center, Double Control (3 position)



Open Center, Double Control (3 position)

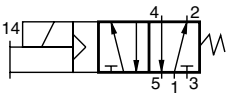
W60 Spool & Sleeve Valves for ISO Bases (5599/I)

5/2 Valves – Single Solenoid Pilot Spring Return

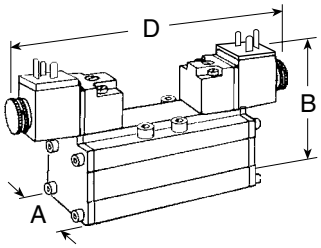


ISO Size	Avg. C_V	Range of Port Sizes	Valve Model Numbers*	Weight lb. (kg.)
1	0.8	1/8 - 3/8	W6076B2401	1.5 (0.7)
2	1.9	3/8 - 1/2	W6076B3401	2 (0.9)
3	3.8	1/2 - 3/4	W6076B4401	3.5 (1.6)

* Base and electrical connector not included. See pages 15-16 for accessories.

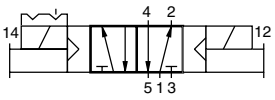


5/2 Valves – Double Solenoid Pilot Momentary Control

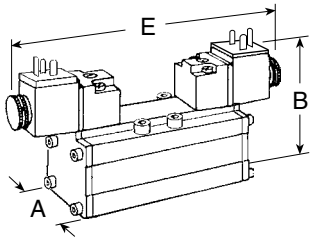


ISO Size	Avg. C_V	Range of Port Sizes	Valve Model Numbers*	Weight lb. (kg.)
1	0.8	1/8 - 3/8	W6076B2407	2.0 (0.9)
2	1.9	3/8 - 1/2	W6076B3407	2.5 (1.1)
3	3.8	1/2 - 3/4	W6076B4407	4.0 (1.8)

* Base and electrical connector not included. See pages 15-16 for accessories.



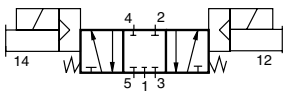
5/3 Valves – Double Solenoid Pilot



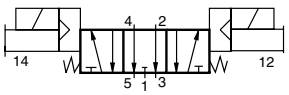
ISO Size	Avg. C_V	Range of Port Sizes	Valve Model Numbers* Power Center	Closed Center	Open Center	Weight lb. (kg.)
1	0.8	1/8 - 3/8	W6077A2951	W6077B2401	W6077B2407	2.0 (0.9)
2	1.9	3/8 - 1/2	W6077A3945	W6077B3401	W6077B3407	2.5 (1.1)
3	3.8	1/2 - 3/4	W6077B4934	W6077B4401	W6077B4407	4.0 (1.8)

* Base and electrical connector not included. See pages 15-16 for accessories.

POWER CENTER



CLOSED CENTER



OPEN CENTER

Electrical connection conforming to ANSI standard B93.55M is available. Refer to ROSS Bulletin 379B.

STANDARD SPECIFICATIONS: For valves on this page.
Solenoids: AC or DC power. See page 81 for voltages.
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: At least 30 psig (2 bar).
Size 2 and 3: At least 15 psig (1 bar).
Internal/External Supply: Selected automatically.

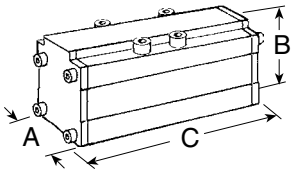
IMPORTANT NOTE
Please read carefully and thoroughly all of the **CAUTIONS** on page 82.

OVERALL DIMENSIONS inches (mm)

Size	A	B	C	D	E
1	1.7 (42)	3.2 (82)	5.4 (137)	6.9 (175)	6.8 (173)
2	2.1 (54)	3.5 (90)	6.3 (160)	7.6 (192)	7.7 (196)
3	2.6 (65)	3.7 (94)	6.3 (160)	6.7 (171)	6.7(171)

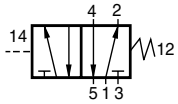
W60 Spool & Sleeve Valves for ISO Bases (5599/I)

5/2 Valves – Single Pressure Control Spring Return

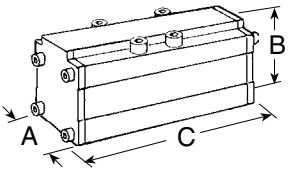


ISO Size	Avg. C_V	Range of Port Sizes	Valve Model Numbers*	Weight lb. (kg)
1	0.8	1/8 - 3/8	W6056B2411	0.8 (0.4)
2	1.9	3/8 - 1/2	W6056B3411	1.5 (0.7)
3	3.8	1/2 - 3/4	W6056B4411	3.0 (1.4)

* Base not included. See pages 15-16 for accessories.

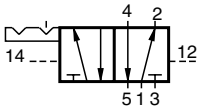


5/2 Valves – Double Pressure Momentary Control

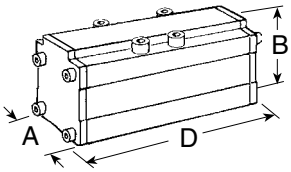


ISO Size	Avg. C_V	Range of Port Sizes	Valve Model Numbers*	Weight lb. (kg)
1	0.8	1/8 - 3/8	W6056B2417	0.8 (0.4)
2	1.9	3/8 - 1/2	W6056B3417	1.5 (0.7)
3	3.8	1/2 - 3/4	W6056B4417	3.0 (1.4)

* Base not included. See pages 15-16 for accessories.

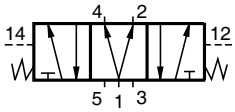


5/3 Valves – Double Pressure Control

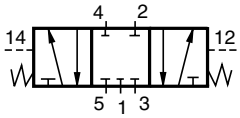


ISO Size	Avg. C_V	Range of Port Sizes	Valve Model Numbers*			Weight lb. (kg)
			Power Center	Closed Center	Open Center	
1	0.8	1/8 - 3/8	W6057A2934	W6057B2411	W6057B2417	1.0 (0.5)
2	1.9	3/8 - 1/2	W6057A3933	W6057B3411	W6057B3417	1.5 (0.7)
3	3.8	1/2 - 3/4	—	W6057B4411	W6057B4417	3.0 (1.4)

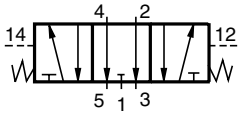
* Base not included. See pages 15-16 for accessories.



POWER CENTER



CLOSED CENTER



OPEN CENTER

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).
Flow Media: Filtered air. 5 micron recommended.
Inlet Pressure: Vacuum to 150 psig (10 bar).
Pilot Pressure:
Size 1: At least 30 psig (2 bar).
Size 2 and 3: At least 15 psig (1 bar).

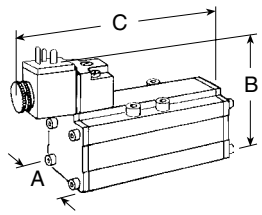
IMPORTANT NOTE
Please read carefully and thoroughly all of the **CAUTIONS** on page 82.

OVERALL DIMENSIONS inches (mm)

Size	A	B	C	D
1	1.7 (42)	1.8 (47)	4.1(105)	4.2 (107)
2	2.1 (54)	2.1 (54)	5.0 (126)	5.4 (135)
3	2.6 (65)	2.6 (65)	6.0 (152)	6.2 (158)

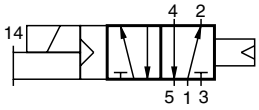
W64 Poppet Valves for ISO Bases (5599/I)

5/2 Valves – Single Solenoid Pilot Air Return

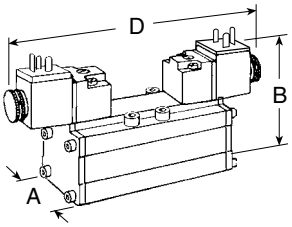


ISO Size	Avg. C_V	Range of Port Sizes	Valve Model Numbers* Std. Temp.	High Temp.	Weight lb. (kg)
1	1.0	1/8 - 3/8	W6476B2401	W6476B2402	1.3 (0.6)
2	2.0	3/8 - 1/2	W6476B3401	W6476B3402	1.8 (0.8)
3	4.0	1/2 - 3/4	W6476B4401	W6476B4402	2.8 (1.3)

* Base and electrical connector not included. See pages 15-16 for accessories.

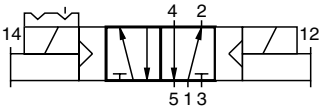


5/2 Valves – Double Solenoid Pilot Momentary Control



ISO Size	Avg. C_V	Range of Port Sizes	Valve Model Numbers* Std. Temp.	High Temp.	Weight lb. (kg)
1	1.0	1/8 - 3/8	W6476B2407	W6476B2408	1.8 (0.8)
2	2.0	3/8 - 1/2	W6476B3407	W6476B3408	2.3 (1.0)
3	4.0	1/2 - 3/4	W6476B4407	W6476B4408	3.3 (1.5)

* Base and electrical connector not included. See pages 15-16 for accessories.



Electrical connection conforming to ANSI standard B93.55M is available. Refer to ROSS Bulletin 397B.

STANDARD SPECIFICATIONS: For valves on this page.
Solenoids: AC or DC power. See page 81 for voltages.
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.

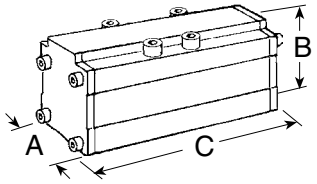
IMPORTANT NOTE
Please read carefully and thoroughly all of the **CAUTIONS** on page 82.

OVERALL DIMENSIONS inches (mm)

Size	A	B	C	D
1	1.7 (42)	3.2 (82)	5.4 (137)	6.9 (175)
2	2.1 (54)	3.5 (90)	6.3 (153)	7.6 (192)
3	2.6 (65)	3.7 (94)	6.6 (168)	6.8 (172)

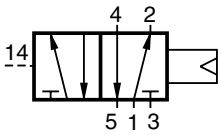
W64 Poppet Valves for ISO Bases (5599/I)

5/2 Valves – Single Pressure Control Air Return

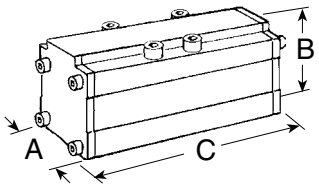


ISO Size	Avg. C_V	Range of Port Sizes	Valve Model Numbers* Std. Temp.	High Temp.	Weight lb. (kg)
1	1.0	1/8 - 3/8	W6456B2411	W6456B2412	.8 (.4)
2	2.0	3/8 - 1/2	W6456B3411	W6456B3412	1.3 (.6)
3	4.0	1/2 - 3/4	W6456B4411	W6456B4412	2.3 (1.0)

* Base not included. See pages 15-16 for accessories.

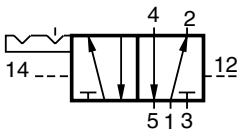


5/2 Valves – Double Pressure Control Momentary



ISO Size	Avg. C_V	Range of Port Sizes	Valve Model Numbers* Std. Temp.	High Temp.	Weight lb. (kg)
1	1.0	1/8 - 3/8	W6456B2417	W6456B2418	.8 (.4)
2	2.0	3/8 - 1/2	W6456B3417	W6456B3418	1.3 (.6)
3	4.0	1/2 - 3/4	W6456B4417	W6456B4418	2.3 (1.0)

* Base not included. See pages 15-16 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 page 82.

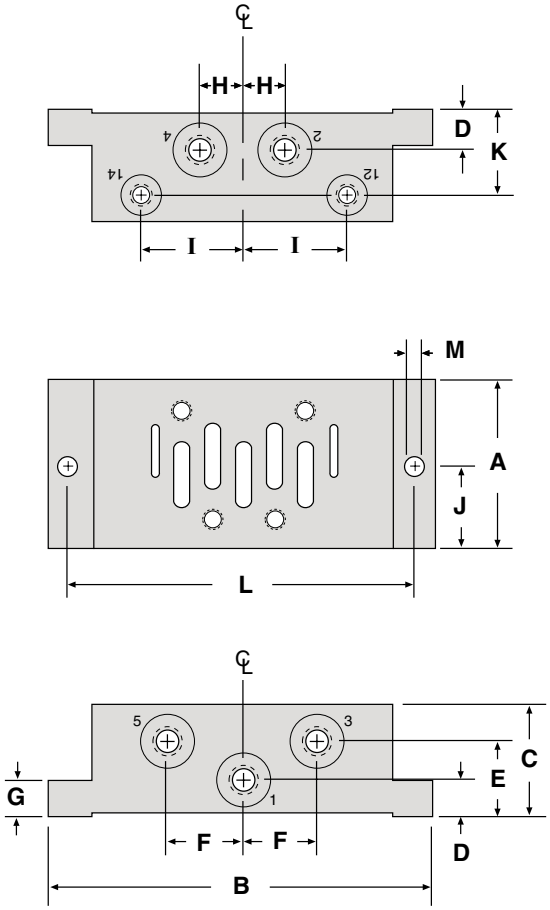
OVERALL DIMENSIONS inches (mm)

Size	A	B	C
1	1.6 (41)	1.8 (46)	4.3 (109)
2	2.1 (53)	2.1(54)	5.1 (130)
3	2.6 (66)	2.2 (56)	6.4 (165)

Sub-Bases & Manifolds for ISO 5599/I Valves

SUB-BASE NUMBERS and PORT SIZES

ISO Size	Side Ported	Bottom Ported	Port Sizes 1, 2, 4	3, 5	12, 14
	654K91	–	1/8	1/4	1/8
1	600C01	659K91	1/4	1/4	1/8
	D600C01	–	G1/4	G1/4	G1/8
	642K91	–	3/8	3/8	1/8
	601C01	660K91	3/8	3/8	1/8
2	D601C01	–	G3/8	G3/8	G1/8
	643K91	–	1/2	1/2	1/8
	602C01	661K91	1/2	1/2	1/8
3	D602C01	–	G1/2	G1/2	G1/8
	644K91	–	3/4	3/4	1/8



Sub-base Dimensions inches (mm)

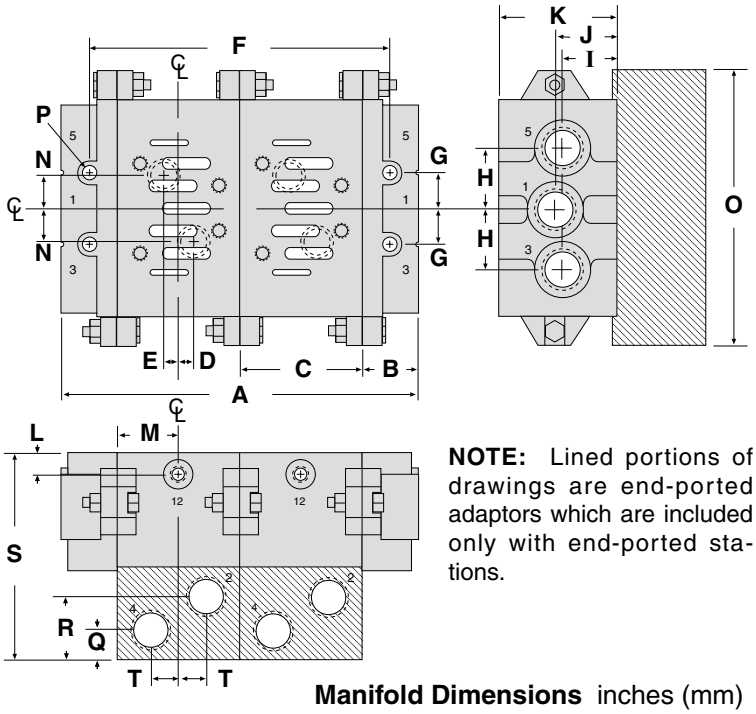
	ISO 1	ISO 2	ISO 3
A	1.89 (48)	2.24 (57)	2.80 (71)
B	4.33 (110)	4.88 (124)	5.87 (149)
C	1.26 (32)	1.57 (40)	1.26 (32)*
D	0.41 (11)	0.55 (14)	0.67 (17)
E	0.85 (22)	1.02 (26)	0.67 (17)
F	0.85 (22)	1.10 (28)	1.34 (34)
G	0.39 (10)	0.51 (13)	0.71 (18)
H	0.47 (12)	0.59 (15)	0.63 (16)
I	1.14 (29)	1.46 (37)	1.77 (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
	D460K91	D664K91	D326K86	G1/4	G3/8	G1/8
2	461K91	665K91	327K86	3/8	1/2	1/8
	D461K91	D665K91	D327K86	G3/8	G1/2	G1/8
3	462K91	666K91	328K86	1/2	1	1/8
	D462K91	D666K91	D328K86	G1/2	G1	G1/8



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

ACCESSORIES and OPTIONS for MANIFOLDS Blank Station Kits, Blocking Discs, Pressure Plates, Transition Plates and other available options are shown on page 16.

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

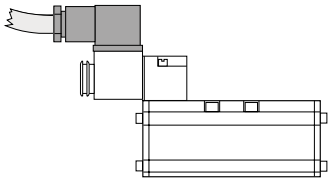
Manifold Dimensions inches (mm)

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

Accessories for ISO 5599/I Valves

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 6-1/2- 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 (8mm) 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**

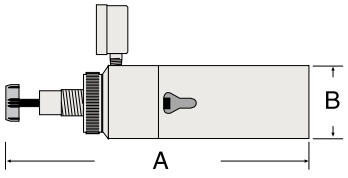
INDEPENDENT PRESSURE PLATES
When a valve in a manifold installation must work at a different pressure than that supplied to the manifold, an independent supply can be provided via an independent pressure plate. The pressure plate mounts between valve and base and isolates the valve from the manifold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

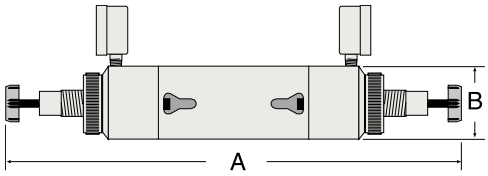
BLOCKING DISKS
Ports between manifold stations can be closed by means of blocking disks.

	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

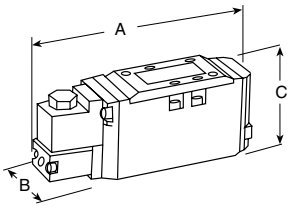
ISO Size	Single	Double
1	1300K91	1302K91
2	1303K91	1305K91
3	1306K91	1308K91

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)

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

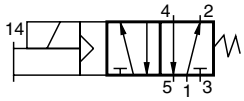
5/2 Valves – Single Solenoid Pilot



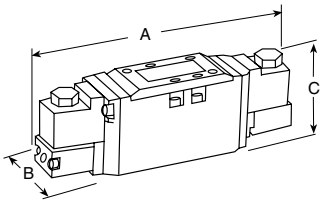
ISO Size	Avg. C_V	Port Size	Valve Model Number*	Weight lb. (kg)
1	1.0	1/4-3/8	W6576A2401	1.5 (0.7)
2	2.3	3/8-1/2	W6576A3401	2.0 (1.0)
3	3.4	1/2-3/4	W6576A4401	3.5 (1.6)

*See pages 19-21 for accessories. Valve dimensions on page 18.

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, request Bulletin 379B.

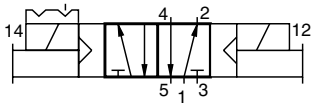


5/2 Valves – Double Solenoid Pilot

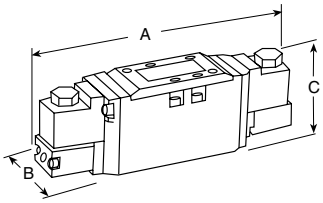


ISO Size	Avg. C_V	Port Size	Valve Model Number*	Weight lb. (kg)
1	1.0	1/4-3/8	W6576A2407	2.0 (1.0)
2	2.3	3/8-1/2	W6576A3407	2.5 (1.2)
3	3.4	1/2-3/4	W6576A4407	4.0 (1.9)

*See pages 19-21 for accessories. Valve dimensions on page 18.



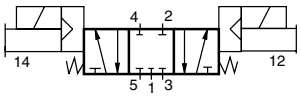
5/3 Valves – Double Solenoid Pilot



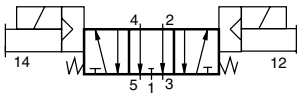
ISO Size	Avg. C_V	Port Size	Valve Model Number* Power Center	Closed Center	Open Center	Weight lb. (kg)
1	1.0	1/4-3/8	W6577A2902	W6577A2401	W6577A2407	2.0 (1.0)
2	2.3	3/8-1/2	W6577A3901	W6577A3401	W6577A3407	2.5 (1.2)
3	3.4	1/2-3/4	W6577A4900	W6577A4401	W6577A4407	4.0 (1.9)

* See pages 19-21 for accessories. Valve dimensions on page 18.

POWER CENTER



CLOSED CENTER



OPEN CENTER

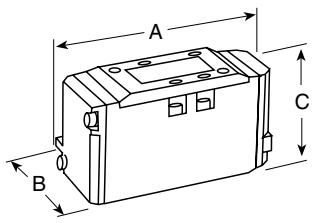
STANDARD SPECIFICATIONS: For valves on this page.
Solenoids: Rated for continuous duty. Standard voltages 100–110 volts 50 Hz; 100–120 volts 60 Hz; 24, 110 volts DC
Power Consumption: Each solenoid. 6.5 VA holding on 50 or 60 Hz; 3.5 watts on DC (at 10 bar).
Ambient Temperature: 40° to 120°F (4° to 50°C).
Media Temperature: 40° to 175°F (4° to 80°C).

Flow Media: Filtered air. 5 micron recommended.
Inlet Pressure: Standard- Size 1: 2-10 bar, Size 2: 1-10 bar, Size 3: 1-10 bar. All sizes 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 page 82.

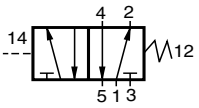
W65 Spool and Sleeve Valves for ISO Bases (5599/II)

5/2 Valves – Single Remote Pressure Control Spring Return

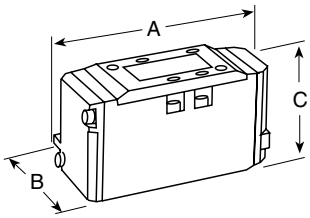


ISO Size	Avg. C_V	Port Size	Valve Model Number*	Weight lb. (kg)
1	1.0	1/4-3/8	W6556A2411	0.8 (0.4)
2	2.3	3/8-1/2	W6556A3411	1.5 (0.7)
3	3.4	1/2-3/4	W6556A4411	3.0 (1.4)

*See pages 19-21 for accessories. Valve dimensions shown below.

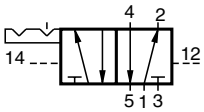


5/2 Valves – Double Remote Pressure Momentary Control

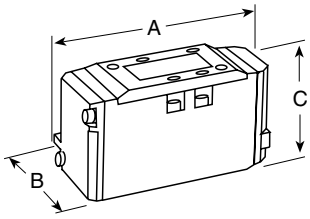


ISO Size	Avg. C_V	Port Size	Valve Model Number*	Weight lb. (kg)
1	1.0	1/4-3/8	W6556A2417	0.8 (0.4)
2	2.3	3/8-1/2	W6556A3417	1.5 (0.7)
3	3.4	1/2-3/4	W6556A4417	3.0 (1.4)

*See pages 19-21 for accessories. Valve dimensions shown below.

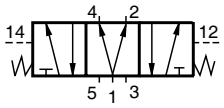


5/3 Valves – Double Remote Pressure Control

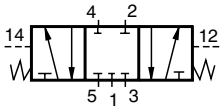


ISO Size	Avg. C_V	Port Size	Valve Model Number*			Weight lb. (kg)
			Power Center	Closed Center	Open Center	
1	1.0	1/4-3/8	—	W6557A2411	W6557A2417	1.0 (0.5)
2	2.3	3/8-1/2	W6557A3901	W6557A3411	W6557A3417	1.5 (0.7)
3	3.4	1/2-3/4	W6557A4900	W6557A4411	W6557A4417	3.0 (1.4)

*See pages 19-21 for accessories. Valve dimensions shown below.



POWER CENTER



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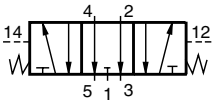


OPEN CENTER

OVERALL DIMENSIONS inches (mm)

Type	Size	A	B	C
Sgl. Sol.	1	6.3 (161)	1.6 (41)	2.7 (69)
Sgl. Sol.	2	7.3 (186)	2.1 (52)	2.8 (71)
Sgl. Sol.	3	8.5 (216)	2.6 (67)	3.1 (78)
Dbl. Sol.	1	8.8 (224)	1.6 (41)	2.7 (69)
Dbl. Sol.	2	9.0 (228)	2.1 (52)	2.8 (71)
Dbl. Sol.	3	10.0 (254)	2.6 (67)	3.1 (79)
Rem. Pressure	1	4.8 (121)	1.6 (41)	2.7 (68)
Rem. Pressure	2	5.8 (148)	2.1 (52)	2.8 (71)
Rem. Pressure	3	7.0 (178)	2.6 (67)	3.1 (79)

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).
Flow Media: Filtered air. 5 micron recommended.
Inlet Pressure: Standard- Size 1: 2-10 bar, Size 2: 1-10 bar,
Size 3: 1-10 bar. All sizes 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 page 82.

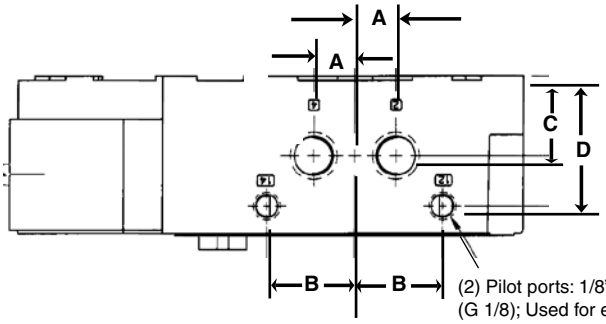
Bases for W65 ISO Valves (5599/II)

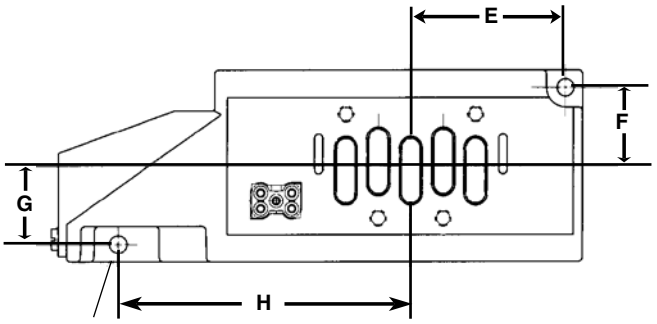
Side and Bottom-Ported Bases

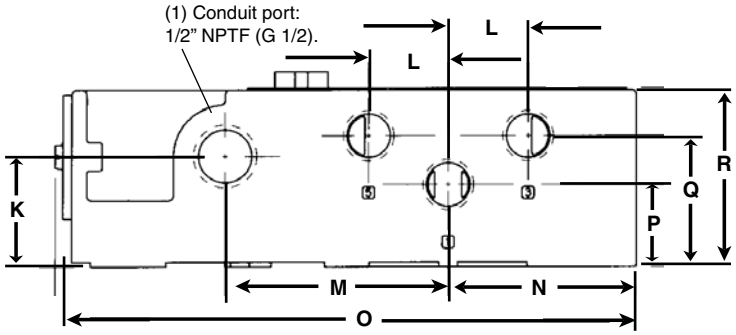
ISO Size	Port Size	Base Station Model Number
ISO 1	1/4 NPTF Side	949N91
	1/4 NPTF Side/Bottom	971N91
	3/8 NPTF Side	950N91
	3/8 NPTF Side/Bottom	972N91
	G 1/4 Side	D949N91
	G 3/8 Side	D950N91
ISO 2	3/8 NPTF Side	951N91
	3/8 NPTF Side/Bottom	952N91
	1/2 NPTF Side	953N91
	1/2 NPTF Side/Bottom	954N91
	G 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
	G1/2 Side/Bottom	D956N91
	G 3/4 Side	D957N91
	G 3/4 Side/Bottom	D958N91

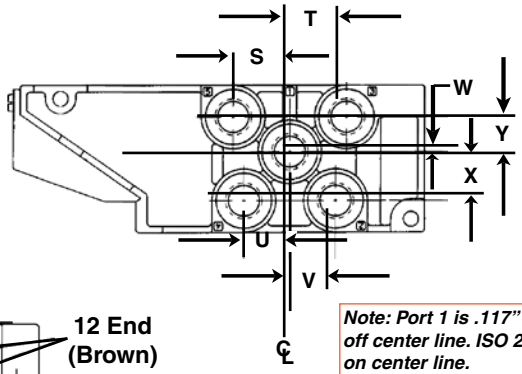
Base Dimensions inches (mm)

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

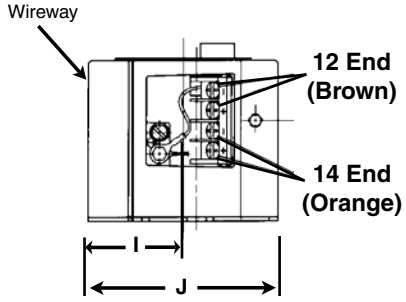








Note: Port 1 is .117" (3 mm) off center line. ISO 2, 3 fall on center line.



Assembled manifolds also available. Consult ROSS.

Manifolds for 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)	.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)	.32 (8)	0.5 (13)
T	0.3 (7)	.30 (8)	0.5 (12)
U	2.0 (51)	2.7 (67)	3.1 (79)
V	----------	1.0 (26)	1.3 (32)

End Station Kit Numbers

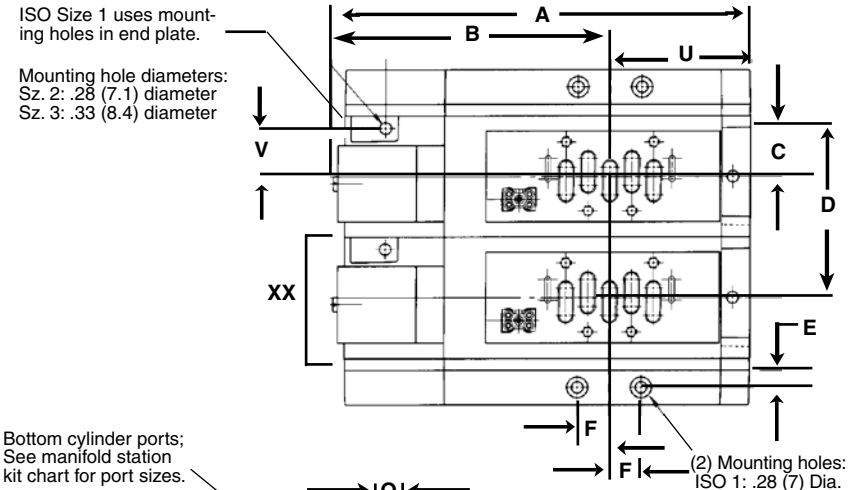
Series	Port Size	Part No.
ISO 1	3/8" NPTF	493N86
	G 3/8	D493N86
ISO 2	1/2" NPTF	494N86
	G 1/2	D494N86
ISO 3	1" NPTF	495N86
	G 1	D495N86

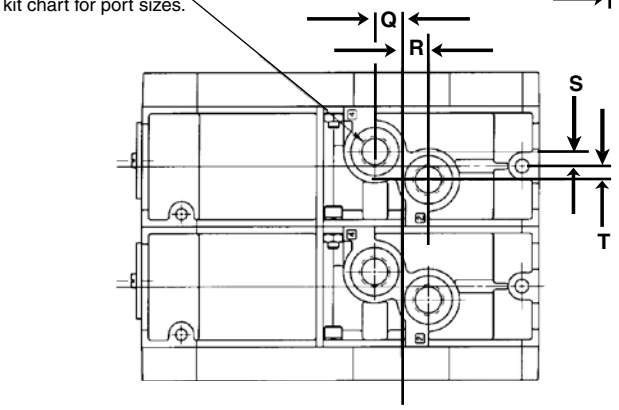
* Each end station kit includes left and right end plates, socket head screws, nuts and seals.

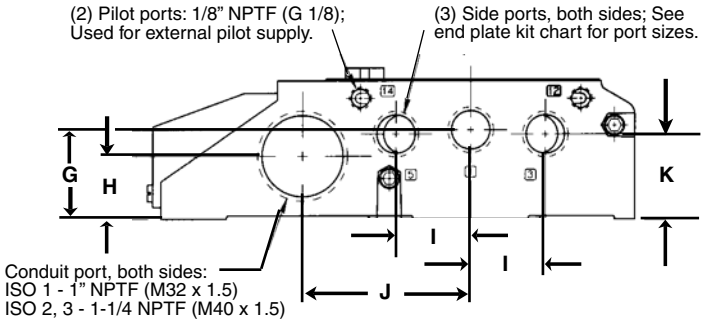
Manifold Station Assembly Numbers

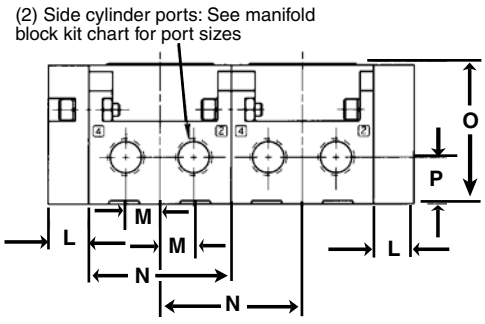
Series	Port Size	Part No.
ISO 1	1/4" NPTF End/Bottom	959N91
	3/8" NPTF End/Bottom	960N91
	G 1/4 End/Bottom	D959N91
	G 3/8 End/Bottom	D960N91
ISO 2	3/8" NPTF End/Bottom	961N91
	1/2" NPTF End/Bottom	962N91
	G 3/8 End/Bottom	D961N91
	G 1/2 End/Bottom	D962N91
ISO 3	1/2" NPTF End/Bottom	963N91
	3/4" NPTF End/Bottom	964N91
	G 1/2 End/Bottom	D963N91
	G 3/4 End/Bottom	D964N91

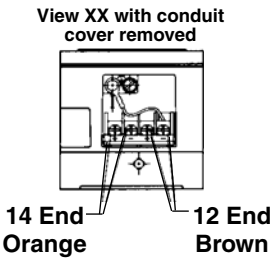
* Each Manifold Station Assembly includes a manifold assembly, socket head screws, nuts and seals.







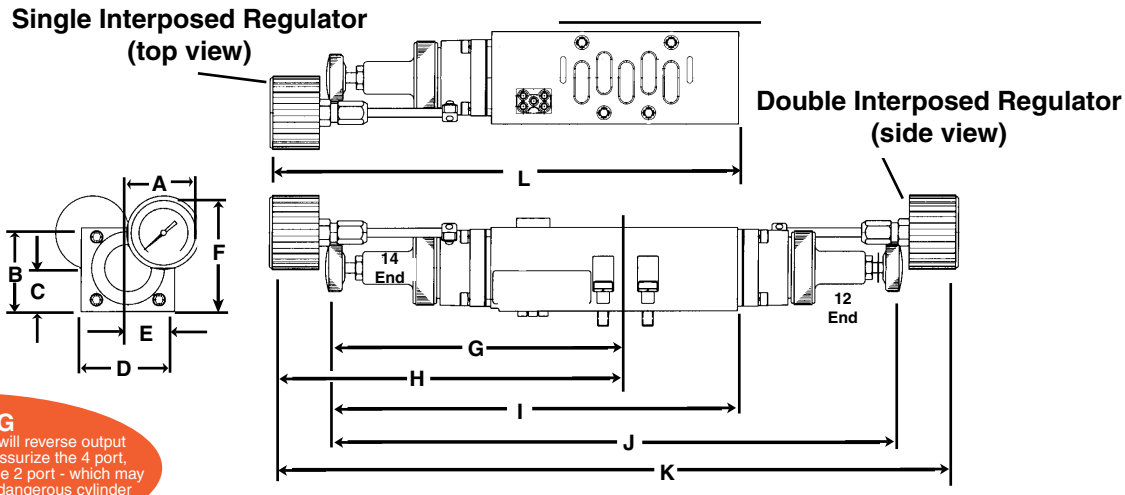




Accessories for Series 65 ISO Valves (5599/II)

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)**.

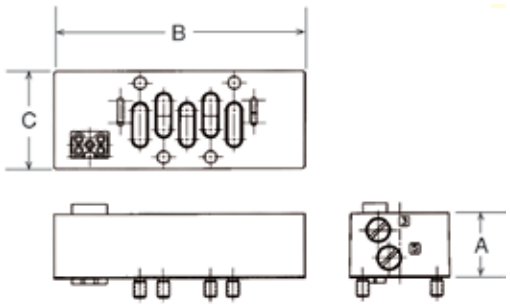


WARNING
Double interposed regulators will reverse output ports - the 12 solenoid will pressurize the 4 port, the 14 solenoid will pressurize the 2 port - which may cause unexpected, potentially dangerous cylinder movement at valve pressurization.

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.



		Dimensions inches (mm)		
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:

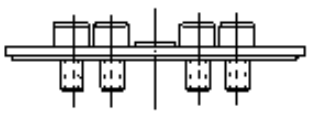
To bank different manifold sizes together.

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

Blank Station Kits

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



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

Pilot Port Blocking Plug

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

ISO Size	Part Number
1	1375N77
2	1377N77
3	1379N77

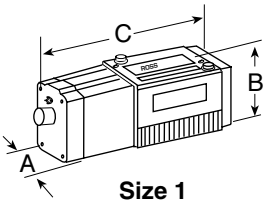
Blocking Disk Kits

A blocking disk closes the ports between manifold stations.

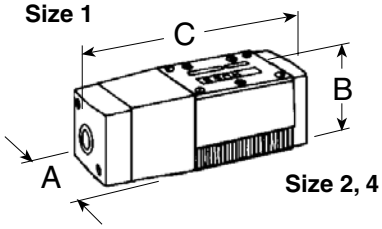
ISO Size	Part Number
1	1376N77
2	1378N77
3	1380N77

W70 Spool & Sleeve Valves for ANSI-type Bases

5/2 Valves – Single Direct Solenoid Spring Return



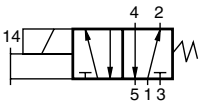
Size 1



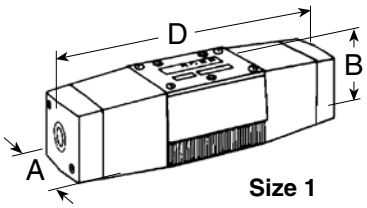
Size 2, 4

Size	Range of Port Sizes	Avg. C_v	Valve Model Numbers*	Weight lb. (kg)
1.0	1/4 - 3/8	1.0	W7016A2331	3.5 (1.6)
2.5	3/8 - 1/2	2.5	W7016A3331	3.3 (1.5)
4	3/8 - 3/4	4.2	W7016C4331	4.3 (1.9)

* Base not included. See pages 27-29 for accessories.



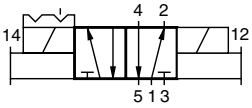
5/2 Valves – Double Direct Solenoid Momentary Control



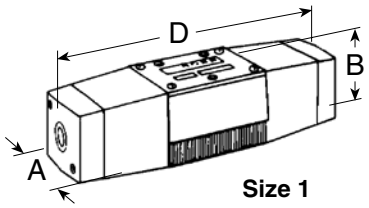
Size 1

Size	Range of Port Sizes	Avg. C_v	Valve Model Numbers*	Weight lb. (kg)
1.0	1/4 - 3/8	1.0	W7016A2332	4.5 (2.0)
2.5	3/8 - 1/2	2.5	W7016A3332	5.0 (2.3)
4	3/8 - 3/4	4.2	W7016C4332	5.8 (2.6)

* Base not included. See pages 27-29 for accessories.



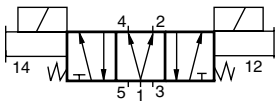
5/3 Valves – Double Direct Solenoid



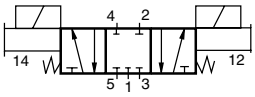
Size 1

Size	Range of Port Sizes	Avg. C_v	Valve Model Numbers* Power Center	Closed Center	Open Center	Weight lb. (kg)
1.0	1/8 - 3/8	1.0	W7017A2905	W7017A2331	W7017A2332	4.5 (2.0)
2.5	3/8 - 1/2	2.5	—	W7017A3331	W7017A3332	5.0 (2.3)
4	1/2 - 3/4	4.2	—	W7017C4331	W7017C4332	5.8 (2.6)

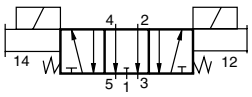
* Base not included. See pages 27-29 for accessories.



POWER CENTER



CLOSED CENTER



OPEN CENTER

STANDARD SPECIFICATIONS: For valves on this page.
Solenoids: AC power; DC for C_v= 1.0 models only. See page 81 for voltages.
Power Consumption: Each solenoid.
C_v= 1.0 models: 140 VA inrush, 30 VA holding on 50 or 60 Hz; 20 watts on DC.
All other models- 380 VA inrush, 58 VA holding.
Indicator Light: Available.
Ambient Temperature: 40° to 175° F (4° to 80°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).

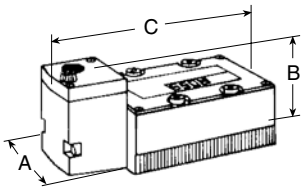
IMPORTANT NOTE
Please read carefully and thoroughly all of the **CAUTIONS** on page 82.

OVERALL DIMENSIONS inches (mm)

Avg. C_v	A	B	C	D
1.0	2.0 (50)	2.3 (58)	7.0 (177)	8.9 (226)
2.5	2.6 (66)	2.6 (66)	8.3 (209)	10.8 (273)
4.2	3.5 (88)	2.8 (70)	10.0 (254)	13.2 (335)

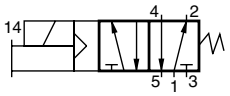
W70 Spool & Sleeve Valves for ANSI-type Bases

5/2 Valves – Single Solenoid Pilot Spring Return

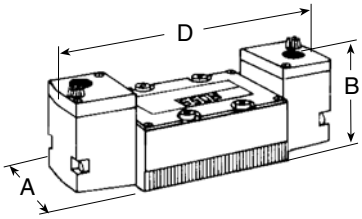


Size	Range of Port Sizes	Avg. C_v	Valve Model Numbers*	Weight lb. (kg)
1.0	1/4 - 3/8	1.0	W7076A2331	3.0 (1.4)
2.5	3/8 - 1/2	2.5	W7076A3331	3.0 (1.4)
4	3/8 - 3/4	4.2	W7076D4331	5.3 (2.4)
10	3/4 - 1-1/4	10	W7076C6331	7.3 (3.3)
20	1-1/4 - 1-1/2	22	W7076C8331	14.5 (6.5)

* Base not included. See pages 27-29 for accessories.

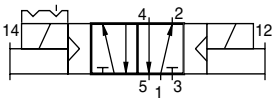


5/2 Valves – Double Solenoid Pilot Momentary Control

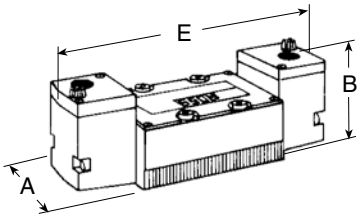


Size	Range of Port Sizes	Avg. C_v	Valve Model Numbers*	Weight lb. (kg)
1.0	1/4 - 3/8	1.0	W7076A2332	4.0 (1.8)
2.5	3/8 - 1/2	2.5	W7076A3332	4.0 (1.8)
4	3/8 - 3/4	4.2	W7076D4332	6.5 (2.9)
10	3/4 - 1-1/4	10	W7076C6332	9.0 (4.1)
20	1-1/4 - 1-1/2	22	W7076C8332	15.8 (6.8)

* Base not included. See pages 27-29 for accessories.



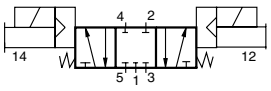
5/3 Valves – Double Solenoid Pilot



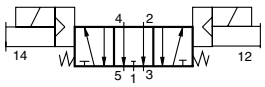
Size	Range of Port Sizes	Avg. C_v	Valve Model Numbers* Power Center	Closed Center	Open Center	Weight lb. (kg)
1.0	1/4 - 3/8	1.0	W7077A2906	W7077A2331	W7077A2332	4.0 (1.8)
2.5	3/8 - 1/2	2.5	W7077A3904	W7077A3331	W7077A3332	4.0 (1.8)
4	3/8 - 3/4	4.2	W7077C4939	W7077D4331	W7077D4332	6.5 (2.9)
10	3/4 - 1-1/4	10	W7077A6920	W7077C6331	W7077C6332	8.5 (3.8)
20	1-1/4 - 1-1/2	22	W7077A8901	W7077C8331	W7077C8332	15.3 (6.9)

* Base not included. See pages 27-29 for accessories.

POWER CENTER



CLOSED CENTER



OPEN CENTER

STANDARD SPECIFICATIONS: For valves on this page.
Solenoids: AC or DC power. See page 81 for voltages.
Power Consumption: Each solenoid.
C_V= 1.0 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: C_V= 4.2, 10, 22 models 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.
Inlet Pressure: Vacuum to 150 psig (10 bar).
Pilot Pressure:
C_V= 1.0 and 22 models: At least 30 psig (2 bar).
C_V= 2.5, 4.2, 10 models: At least 15 psig (1 bar).

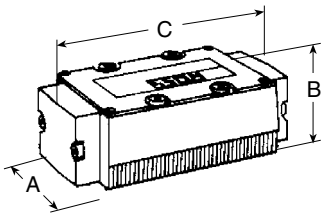
IMPORTANT NOTE
Please read carefully and thoroughly all of the **CAUTIONS** on page 82.

OVERALL DIMENSIONS inches (mm)

Avg. C_v	A	B	C	D	E
1.0	2.0 (50)	2.4 (59)	6.4 (16)	7.7 (194)	7.7 (194)
2.5	2.7 (67)	3.6 (91)	7.3 (185)	8.8 (224)	8.8 (224)
4.2	3.5 (88)	4.0 (101)	8.4 (212)	9.8 (249)	9.8 (249)
10	3.9 (99)	4.0 (101)	9.8 (249)	11.3 (286)	12.1 (307)
22	5.6 (142)	4.1 (104)	15 (381)	16.5 (417)	16.5 (417)

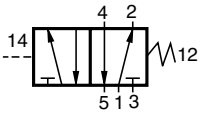
W70 Spool & Sleeve Valves for ANSI-type Bases

5/2 Valves – Single Pressure Control Spring Return

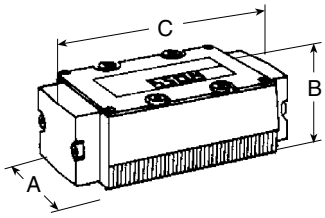


Size	Range of Port Sizes	Avg. C_v	Valve Model Numbers*	Weight lb. kg)
1.0	1/4 - 3/8	1.0	W7056A2331	2.5 (1.1)
2.5	3/8 - 1/2	2.5	W7056A3331	2.0 (0.9)
4	3/8 - 3/4	4.2	W7056B4331	4.3 (1.9)
10	3/4 - 1-1/4	10	W7056A6331	6.3 (2.8)
20	1-1/4 - 1-1/2	22	W7056A8331	13.0 (5.9)

* Base not included. See pages 27-29 for accessories.

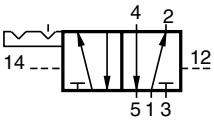


5/2 Valves – Double Pressure Control Momentary Control

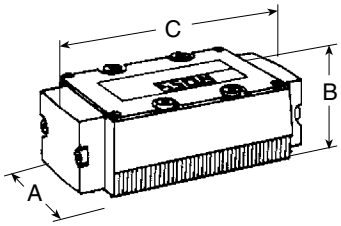


Size	Range of Port Sizes	Avg. C_v	Valve Model Numbers*	Weight lb. (kg)
1.0	1/4 - 3/8	1.0	W7056A2332	2.5 (1.1)
2.5	3/8 - 1/2	2.5	W7056A3332	2.0 (0.9)
4	3/8 - 3/4	4.2	W7056B4332	4.3 (1.9)
10	3/4 - 1-1/4	10	W7056A6332	6.3 (2.8)
20	1-1/4 - 1-1/2	22	W7056A8332	13.8 (6.2)

* Base not included. See pages 27-29 for accessories.

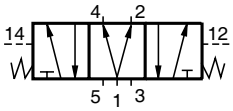


5/3 Valves – Double Pressure Control

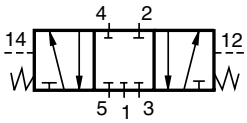


Size	Range of Port Sizes	Avg. C_v	Valve Model Numbers* Power Center	Closed Center	Open Center	Weight lb. (kg)
1.0	1/4 - 3/8	1.0	—	W7057A2331	W7057A2332	2.5 (1.1)
2.5	3/8 - 1/2	2.5	—	W7057A3331	W7057A3332	2.0 (0.9)
4	3/8 - 3/4	4.2	—	W7057B4331	W7057B4332	4.5 (2.0)
10	3/4 - 1-1/4	10	W7057A6902	W7057A6331	W7057A6332	6.3 (2.8)
20	1-1/4 - 1-1/2	22	—	W7057A8331	W7057A8332	13.8 (6.2)

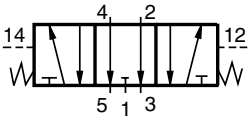
* Base not included. See pages 27-29 for accessories.



POWER CENTER



CLOSED CENTER



OPEN CENTER

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:
C_V= 1.0 and 22 models: At least 30 psig (2 bar).
C_V= 2.5, 4.2, 10 models: At least 15 psig (1 bar).

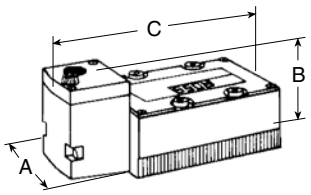
IMPORTANT NOTE
Please read carefully and thoroughly all of the **CAUTIONS** on page 82.

OVERALL DIMENSIONS inches (mm)

Avg. C_v	A	B	C
1.0	2.0 (50)	2.3 (58)	5.1(128)
2.5	2.6 (66)	2.6 (66)	5.7 (145)
4.2	3.5 (88)	2.8 (70)	6.9 (174)
10	3.9 (99)	2.7 (68)	8.3 (211)
22	5.6 (142)	3.0 (76)	13.5 (342)

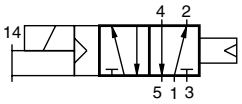
W74 Poppet Valves for ANSI-type Bases

5/2 Valves – Single Solenoid Pilot Air Return

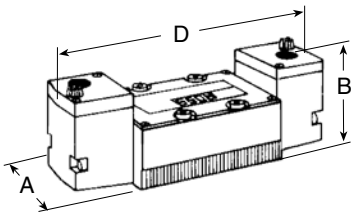


Size	Range of Port Sizes	Avg. C_v	Valve Model Numbers* Std. Temp.	High Temp.	Weight lb. (kg)
1.0	1/4 – 3/8	0.9	W7476A2331	W7476A2336	3.0 (1.4)
2.5	3/8 – 1/2	2.0	W7476A3331	W7476A3336	3.0 (1.4)
4	3/8 – 3/4	4.2	W7476C4331	W7476B4336	5.0 (2.3)
10	3/4 – 1-1/4	11	W7476A6331	W7476A6336	6.1 (2.8)
20	1-1/4 – 1-1/2	22	W7476A8331	W7476A8336	18.5 (8.3)

*Base not included. See pages 27-29 for accessories.

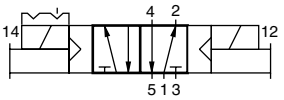


5/2 Valves – Double Solenoid Pilot Momentary Control



Size	Range of Port Sizes	Avg. C_v	Valve Model Numbers* Std. Temp.	High Temp.	Weight lb. (kg)
1.0	1/4 – 3/8	0.9	W7476A2332	W7476A2337	3.5 (1.6)
2.5	3/8 – 1/2	2.0	W7476A3332	W7476A3337	4.0 (1.8)
4	3/8 – 3/4	4.2	W7476C4332	W7476C4337	5.5 (2.5)
10	3/4 – 1-1/4	11	W7476A6332	W7476A6337	10.8 (4.9)
20	1-1/4 – 1-1/2	22	W7476A8332	W7476A8337	19.8 (8.9)

*Base not included. See pages 27-29 for accessories.



STANDARD SPECIFICATIONS: For valves on this page.
Solenoids: AC or DC power. See page 81 for voltages.
Power Consumption: Each solenoid. *C_V = 0.9 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: C_V = 4.2, 11, 22 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.

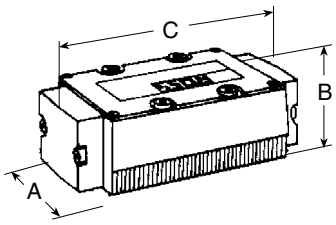
IMPORTANT NOTE
Please read carefully and thoroughly all of the **CAUTIONS** on page 82.

OVERALL DIMENSIONS inches (mm)

Avg. C_v	A	B	C	D
0.9	2.0 (50)	2.4 (59)	6.5 (164)	7.7 (194)
2.0	2.7 (67)	3.6 (91)	7.3 (185)	8.8 (224)
4.2	3.5 (88)	4.0 (101)	8.4 (212)	9.8 (249)
11	3.9 (99)	4.0 (101)	9.8 (249)	11.3 (286)
22	5.6 (142)	4.1 (104)	15 (381)	16.5 (417)

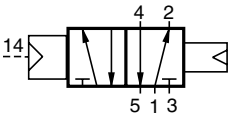
W74 Poppet Valves for ANSI-type Bases

5/2 Valves – Single Pressure Control Air Return

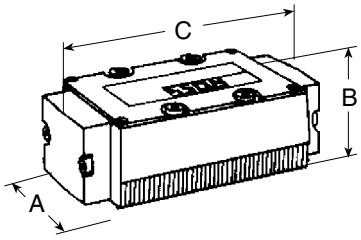


Size	Range of Port Sizes	Avg. C_v	Valve Model Numbers* Std. Temp.	High Temp.	Weight lb. (kg)
1.0	1/4 – 3/8	0.9	W7456A2331	W7456A2336	2.5 (1.1)
2.5	3/8 – 1/2	2.0	W7456A3331	W7456A3336	2.0 (0.9)
4	3/8 – 3/4	4.2	W7456C4331	W7456C4336	3.3 (1.5)
10	3/4 – 1-1/4	11	W7456A6331	W7456A6336	7.3 (3.3)
20	1-1/4 – 1-1/2	22	W7456A8331	W7456A8336	17.5 (7.9)

*Base not included. See pages 27-29 for accessories.

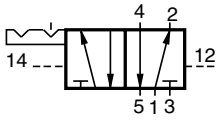


5/2 Valves – Double Pressure Control Momentary Control



Size	Range of Port Sizes	Avg. C_v	Valve Model Numbers* Std. Temp.	High Temp.	Weight lb. (kg)
1.0	1/4 – 3/8	0.9	W7456A2332	W7456A2337	2.5 (1.1)
2.5	3/8 – 1/2	2.0	W7456A3332	W7456A3337	2.0 (0.9)
4	3/8 – 3/4	4.2	W7456C4332	W7456C4337	3.3 (1.5)
10	3/4 – 1-1/4	11	W7456A6332	W7456A6337	7.3 (3.3)
20	1-1/4 – 1-1/2	22	W7456A8332	W7456A8337	17.5 (7.9)

*Base not included. See pages 27-29 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.

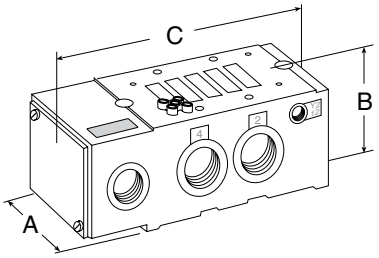
IMPORTANT NOTE
Please read carefully and thoroughly all of the **CAUTIONS** on page 82.

OVERALL DIMENSIONS inches (mm)

Avg. C_v	A	B	C
0.9	2.0 (50)	2.3 (58)	5.1 (128)
2.0	2.6 (66)	2.6 (66)	5.7 (145)
4.2	3.5 (88)	2.8 (70)	6.9 (174)
11	3.9 (99)	2.7 (68)	8.3 (211)
22	5.6 (142)	3.0 (76)	13.5 (342)

ANSI-type Sub-Bases

The sub-base numbers shown in the chart below specify pressure ports with NPT threads, and electrical openings with 1/2 NPT threads. For other thread types see page 81.



Sub-base for C_v = 4.2 valves illustrated.

ANSI-Type SUB-BASES

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

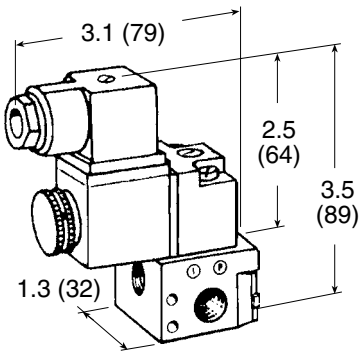
3/2 Miniature Valves for Base Mounting

VALVE MODEL NUMBERS

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

BASES: 1/8 NPT ports. See page 81 for other threads.

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



Valve is shown with electrical connector and on a base. See page 16 for electrical connector. See bases on page 26.

STANDARD SPECIFICATIONS

C_v Rating: 0.1
Solenoids: AC or DC power. See page 81 for voltages.
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).

Electrical connection conforming to ANSI standard B93.55M is available. Refer to ROSS Bulletin 379B.

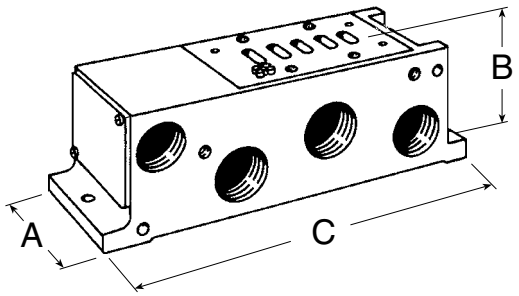
ANSI-type Manifolds

The numbers of the manifold stations shown in the chart below specify pressure ports with NPT threads and electrical openings with 1-1/4 NPT threads. For other thread types see page 81.

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-Type MANIFOLDS

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

* Specify voltage on manifold.

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 page 82.

Accessories for ANSI-type 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 C_V = 0.9 to 2.5 models; 5 to 125 psig (0.3 to 8.5 bar) for C_V = 4.2 models. Maximum inlet pressure is 150 psig (10 bar). Pressure gauge(s) included. Order regulators by the part numbers shown at the right.

	Single	Double * Solenoid	Single Remote Air
C_V = 0.9, 1.0 Valves:	**840C91**	**841C91**	**713C91**
C_V = 2.0, 2.5 Valves:	**626C91**	**627C91**	**714C91**
C_V = 4.2 Valves:	**632C91**	**633C91**	**715C91**

***** Double regulator only for W70 spool valves.

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

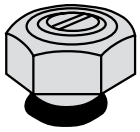
Manual Override Kits for Solenoid Pilot Valves

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

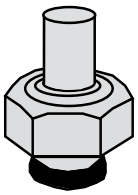
Each of the override buttons in the kits at the right is made of metal and is spring-returned. The locking type button, however, can be kept in the actuated position by turning the slot in the top of the button with a screwdriver.

Order by the kit numbers shown at the right.

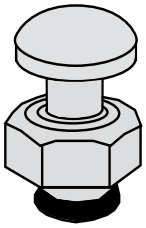
FLUSH BUTTON
Locking type ..... **Kit 792K87**
Non-locking type..... **Kit 790K87**



EXTENDED BUTTON
Non-locking type
Kit 791K87

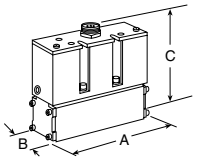


EXTENDED BUTTON WITH PALM ACTUATOR
Non-locking type
Kit 984H87

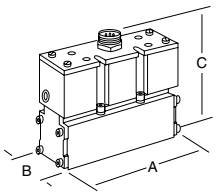


Series 80 Spool & Sleeve Valves for SAE Bases

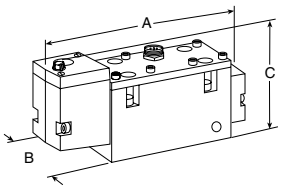
5/2 Spool Valves



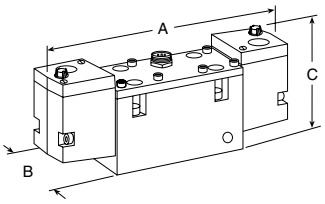
Series 125
Single or Double Solenoid



Series 250
Single or Double Solenoid



Series 500
Single Solenoid

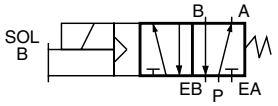


Series 500
Double Solenoid

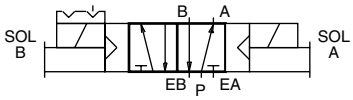
Valve Model Numbers (Base not included)
SINGLE SOLENOID PILOT VALVES

SAE Series	Ford	Type of Wiring Chrysler	Hardwire	Dimensions inches (mm) A	B	C	Weight lb. (kg)
125	8076C3331	8076C3341	8076C3351	5.5 (140)	1.8 (45)	5.1 (129)	3.5 (1.6)
250	8076C4331	8076C4341	8076C4351	7.3 (185)	2.6 (65)	5.6 (142)	6.5 (2.9)
500	8076C6331	8076C6341	8076C6351	10.1 (257)	3.0 (76)	4.8 (121)	8.3 (3.7)
DOUBLE SOLENOID PILOT VALVES							
125	8076C3332	8076C3342	8076C3352	5.5 (140)	1.8 (45)	5.1 (129)	3.5 (1.6)
250	8076C4332	8076C4342	8076C4352	7.3 (185)	2.6 (65)	5.6 (142)	7.0 (3.2)
500	8076C6332	8076C6342	8076C6352	11.2 (285)	3.0 (76)	4.8 (121)	9.5 (4.3)

*C_V ratings on page 31. Bases and manifolds on pages 32-33.

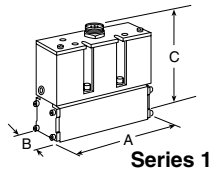


SINGLE SOLENOID

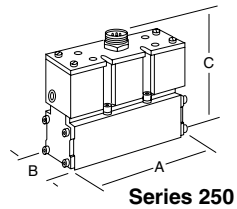


DOUBLE SOLENOID

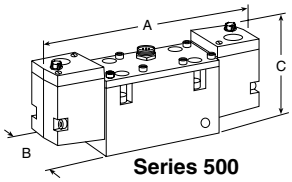
5/3 Spool Valves



Series 125



Series 250



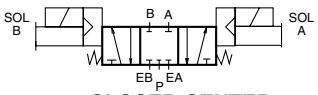
Series 500
Double Solenoid

Valve Model Numbers (Base not included)
POWER CENTER SOLENOID PILOT VALVES

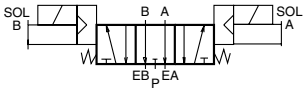
SAE Series	Ford	Type of Wiring Chrysler	Hardwire	Dimensions inches (mm) A	B	C	Weight lb. (kg)
125	8077B3910	8077B3904	—	5.5 (140)	1.8 (45)	5.1 (129)	3.5 (1.6)
250	8077B4907	8077B4904	—	7.3 (185)	2.6 (65)	5.6 (142)	7.0 (3.2)
OPEN CENTER SOLENOID PILOT VALVES							
125	8077C3332	8077C3342	8077B3352	5.5 (140)	1.8 (45)	5.1 (129)	3.5 (1.6)
250	8077C4332	8077C4342	8077B4352	7.3 (185)	2.6 (65)	5.6 (142)	7.0 (3.2)
500	8077C6332	8077C6342	8077B6352	12.0 (306)	3.0(76)	4.8 (121)	9.5 (4.3)
CLOSED CENTER SOLENOID PILOT VALVES							
125	8077C3331	8077C3341	8077B3351	5.5 (140)	1.8 (45)	5.1 (129)	3.5 (1.6)
250	8077C4331	8077C4341	8077B4351	7.3 (185)	2.6 (65)	5.6 (142)	7.0 (3.2)
500	8077C6331	8077C6341	8077B6351	12.0 (306)	3.0(76)	4.8 (121)	9.5 (4.3)

*C_V ratings on page 31. Bases and manifolds on pages 32-33.

POWER CENTER



CLOSED CENTER

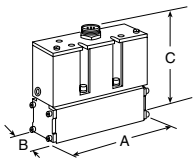


OPEN CENTER

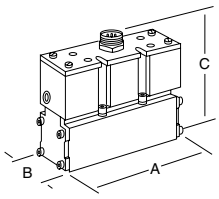
STANDARD SPECIFICATIONS: Rated for continuous duty.
Series 125, 250: 100-110 volts, 50 Hz; 100-120 volts, 60 Hz; 24, 110 volts DC
Series 500: 100-110 volts, 50 Hz; 100-120 volts, 60 Hz; 24, 110 volts DC
Power Consumption: Each solenoid:
Series 125, 250: 8 VA inrush; 6 VA holding on 50/60 Hz 8 watts on DC
Series 500: 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: Remote Pressure Controlled Valves –Interposed Pressure Regulators.

IMPORTANT NOTE
Please read carefully and thoroughly all of the **CAUTIONS** on page 82.

Series 84 Poppet Valves



Series 125
Single or Double Solenoid



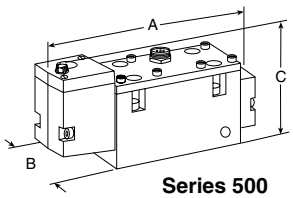
Series 250
Single or Double Solenoid

Valve Model Numbers (Base not included)

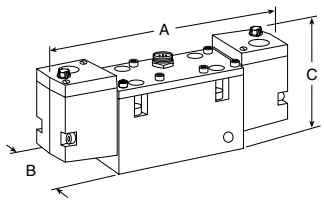
SINGLE SOLENOID PILOT VALVES

SAE Series	Type of Wiring Ford	Chrysler	Hardwire	Dimensions inches (mm) A	B	C	Weight lb. (kg)
125	8476C3331	8476C3341	8476C3351	15.5 (140)	1.8 (45)	5.1 (129)	2.8 (1.3)
250	8476C4331	8476C4341	8476C4351	17.3 (185)	2.6 (65)	5.6 (142)	5.2 (2.4)
500	8476C6331	8476C6341	8476C6351	10.1(257)	3.0 (76)	4.8 (121)	7.7 (3.5)
DOUBLE SOLENOID PILOT VALVES							
125	8476C3332	8476C3342	8476C3352	5.5 (140)	1.8 (45)	5.1 (129)	3.3 (1.5)
250	8476C4332	8476C4342	8476C4352	7.3 (185)	2.6 (65)	5.6 (142)	5.7 (2.6)
500	8476C6332	8476C6342	8476C6352	11.2 (285)	3.0 (76)	7.1 (180)	8.9 (4.1)

*C_V ratings below. Bases and manifolds on pages 32-33. Interposed devices are also available, for more information, refer to Bulletin 376D (ROSS form number A10084).



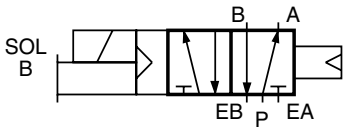
Series 500
Single Solenoid



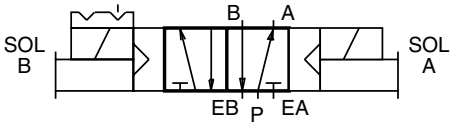
Series 500
Double Solenoid

Average C_V Ratings

Valve Type	Automotive Series 125	250	500
Poppet Valves			
Single Solenoid	1.8	5.5	7.9
Double Solenoid	1.8	5.7	7.6
Spool Valves			
Single Solenoid	1.4	4.0	8.2
Double Solenoid	1.4	4.0	8.0



SINGLE SOLENOID



DOUBLE SOLENOID

IMPORTANT NOTE: The C_V values given in the chart 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: Rated for continuous duty.
Series 125, 250: 100-110 volts, 50 Hz; 100-120 volts, 60 Hz; 24, 110 volts DC
Series 500: 100-110 volts, 50 Hz; 100-120 volts, 60 Hz; 24, 110 volts DC
Power Consumption: Each solenoid:
Series 125, 250: 8 VA inrush; 6 VA holding on 50/60 Hz 8 watts on DC
Series 500: 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: Remote Pressure Controlled Valves – Interposed Pressure Regulators.

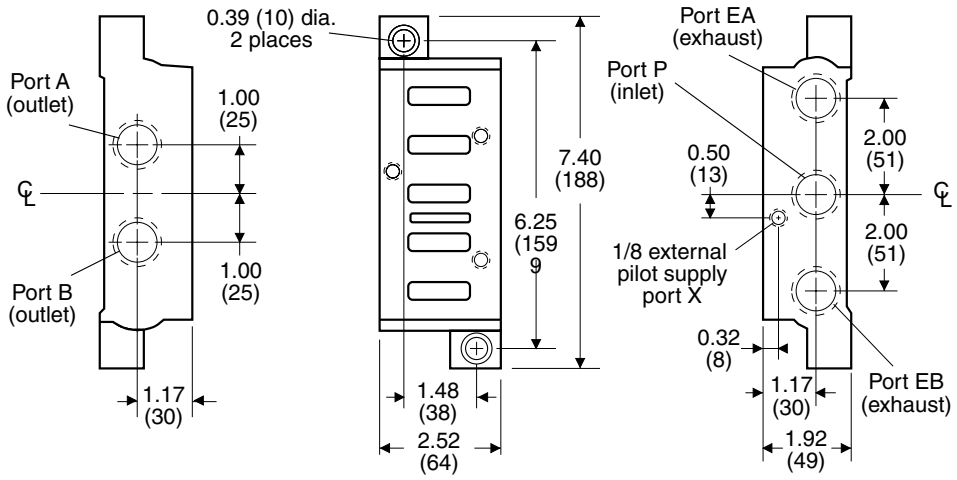
IMPORTANT NOTE
Please read carefully and thoroughly all of the **CAUTIONS** on page 82.

Series 80 & 84 Side-Ported SAE Sub-Bases

Series 125

Sub-Base Number	NPT Threads*	
	A, B	P, EA, EB
577K91	1/8	1/4
578K91	1/4	3/8
579K91	3/8	3/8
* Consult ROSS for SAE threads.		

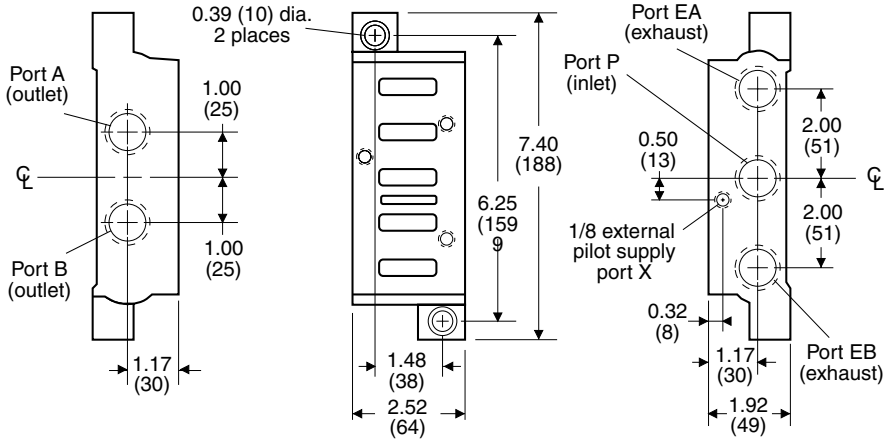
Dimensions: inches (mm).



Series 250

Sub-Base Number	NPT Threads*	
	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
* Consult ROSS for SAE threads.		

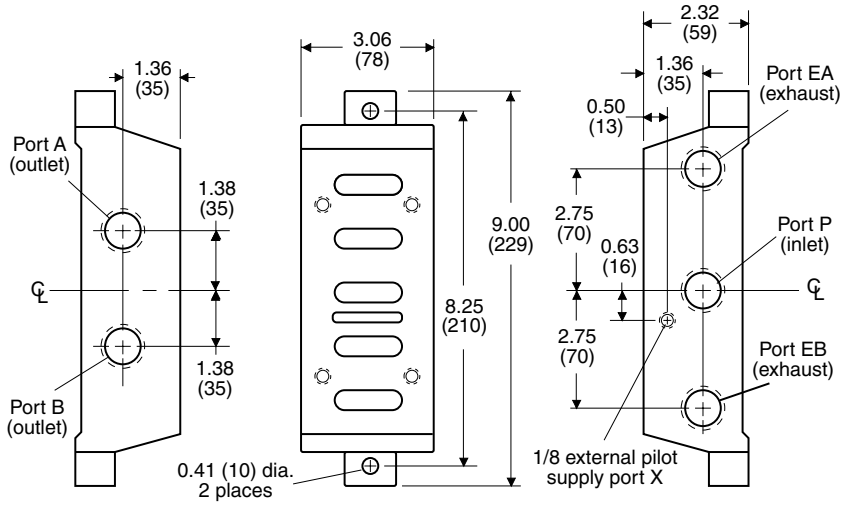
Dimensions: inches (mm).



Series 500

Sub-Base Number	NPT Threads*	
	A, B	P, EA, EB
582K91	1/2	3/4
728K91	3/4	3/4
583K91	3/4	1
584K91	1	1
* Consult ROSS for SAE threads.		

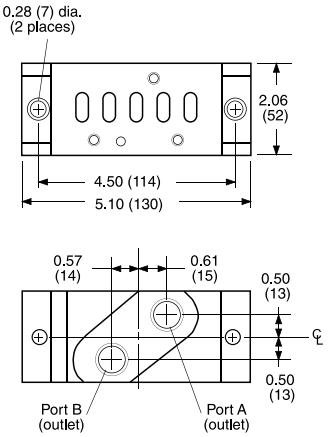
Dimensions: inches (mm).

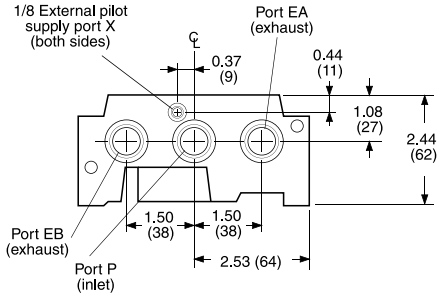


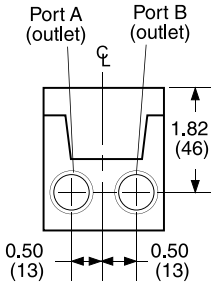
Manifolds for 80 & 84 Series SAE Valves

Series 125 Manifold Stations

Dimensions: inches (mm)





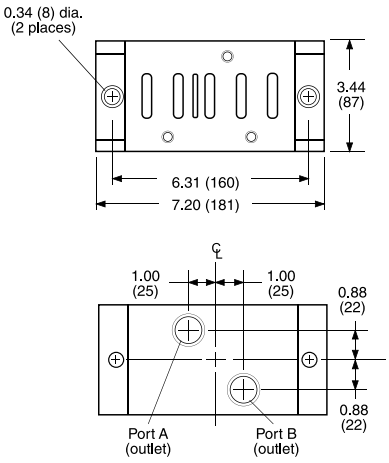


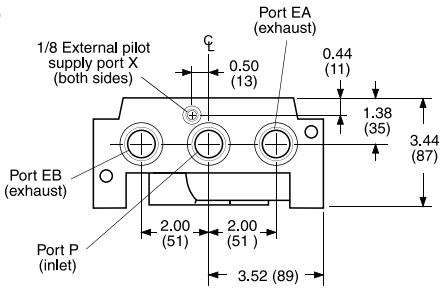
Blanking Plate- For manifold stations not occupied by a valve, blanking plates are available. These plates block the unused air passages. Order by part number **820K77.**

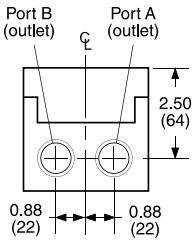
Station Number	NPT Threads A, B	NPT Threads P, EA, EB
580K91	1/4	3/8
581K91	3/8	3/8

* Consult ROSS for SAE threads.

Series 250 Manifold Stations





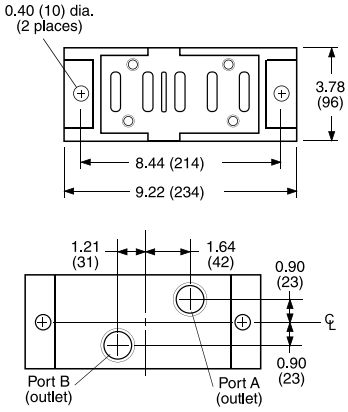


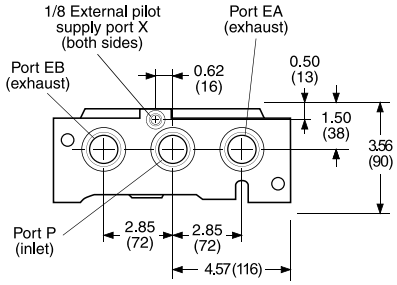
Blanking Plate- For manifold stations not occupied by a valve, blanking plates are available. These plates block the unused air passages. Order by part number **821K77.**

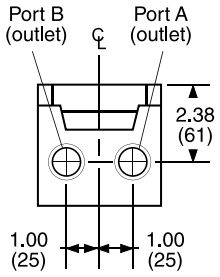
Station Number	NPT Threads A, B	NPT Threads P, EA, EB
553K91	3/8	1/2
554K91	1/2	3/4
555K91	3/4	3/4

* Consult ROSS for SAE threads.

Series 500 Manifold Stations







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.**

Station Number	NPT Threads A, B	NPT Threads P, EA, EB
585K91	1/2	3/4
586K91	3/4	1
587K91	1	1

* Consult ROSS for SAE threads.

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.

Blanking Plate	
125	820K77
250	821K77
500	822K77

Manual Override Kits for Series 500 Valves available. See Bulletin 376D for further information.

ROSS Series 27 Poppet Valves for Line Mounting

Valves in this Series are available with single or double solenoid pilots or an air head for remote 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.

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.

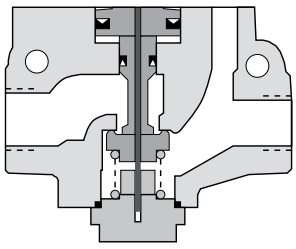
Air Index Adaptor: Allows a single control valve to function as an impulse controlled, detented valve. Successive momentary signals from the same source actuate and de-actuate the valve.

"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.

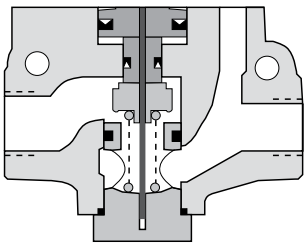
3/2 Valve with Single Solenoid Pilot

4/2 Valve with Double Solenoid Pilot

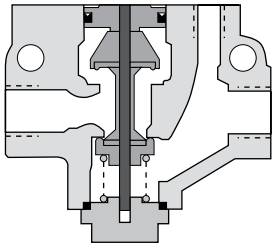
Series 27 Valve Bodies



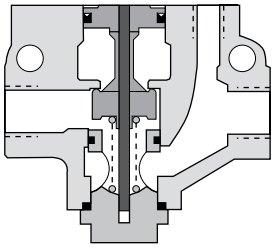
2/2 Normally Closed



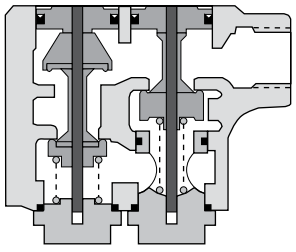
2/2 Normally Open



3/2 Normally Closed



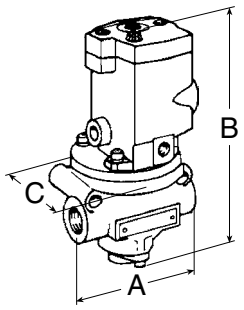
3/2 Normally Open



4/2

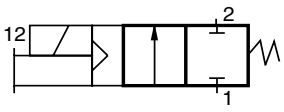
Series 27 Single Solenoid Pilot Inline Valves

2/2 Valves

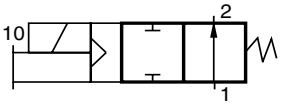


Port Size	Valve Model Numbers Normally Closed	Normally Open	Average C_v N.C.	N.O.	Weight lb. (kg)
1/4	2771B2001	2772B2001	2.3	2.3	
3/8	2771B3001	2772B3001	3.8	3.3	2.5 (1.1)
1/2	2771B4011	2772B4011	4.0	3.5	
1/2	2771B4001	2772B4001	7.7	6.5	
3/4	2771B5001	2772B5001	9.0	7.3	3.3 (1.5)
1	2771B6011	2772B6011	9.0	7.9	
1	2771B6001	2772B6001	24	21	
1-1/4	2771B7001	2772B7001	29	20	7.0 (3.2)
1-1/2	2771B8011	2772B8011	29	21	
1-1/2	2771B8001	2772B8001	49	49	
2	2771B9001	2772B9001	57	57	15.5 (6.9)
2-1/2	2771B9011	2772B9011	64	72	

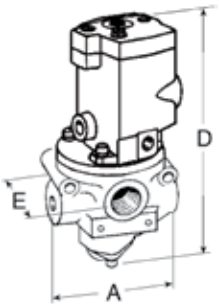
Normally Closed



Normally Open

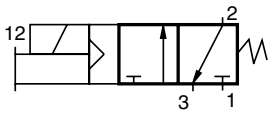


3/2 Valves

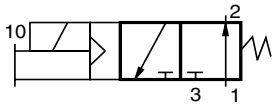


Port Sizes In-Out	Exh.	Valve Model Numbers Normally Closed	Normally Open	Average C_v N.C.	N.O.	Weight lb. (kg)
1/4	1/2	2773B2001	2774B2001	2.8	2.5	
3/8	1/2	2773B3001	2774B3001	4.0	3.0	2.5 (1.1)
1/2	1/2	2773B4011	2774B4011	3.8	3.0	
1/2	1	2773B4001	2774B4001	7.8	7.2	
3/4	1	2773B5001	2774B5001	9.4	7.2	3.3 (1.5)
1	1	2773B6011	2774B6011	10	7.2	
1	1-1/2	2773B6001	2774B6001	29	21	
1-1/4	1-1/2	2773B7001	2774B7001	31	22	7.0 (3.2)
1-1/2	1-1/2	2773B8011	2774B8011	31	21	
1-1/2	2-1/2	2773B8001	2774B8001	69	58	
2	2-1/2	2773B9001	2774B9001	70	60	16.5 (7.4)
2-1/2	2-1/2	2773B9011	2774B9011	71	55	

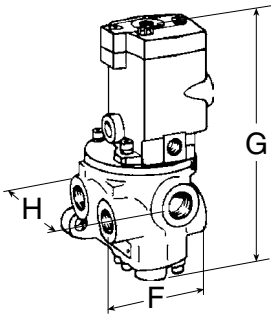
Normally Closed



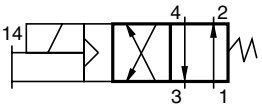
Normally Open



4/2 Valves



Port Sizes In-Out	Exhaust	Valve Model Numbers	Average C_v	Weight lb. (kg)
1/4	1/2	2776B2001	2.5	
3/8	1/2	2776B3001	3.6	3.0 (1.4)
1/2	1/2	2776B4011	3.7	
1/2	1	2776B4001	6.9	
3/4	1	2776B5001	8.2	5.3 (2.4)
1	1	2776B6011	8.9	
1	1-1/2	2776B6001	23	
1-1/4	1-1/2	2776B7001	24	11.3 (5.1)
1-1/2	1-1/2	2776B8011	25	



STANDARD SPECIFICATIONS: For valves on this page.
Solenoids: AC or DC power. See page 81 for voltages.
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 1-1/2 Port Sizes: 15 to 150 psig (1 to 10 bar).
1-1/2 to 2-1/2 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 81.

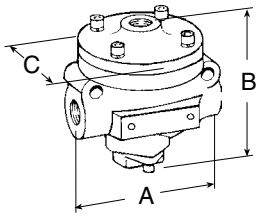
IMPORTANT NOTE
Please read carefully and thoroughly all of the **CAUTIONS** on page 82.

OVERALL DIMENSIONS inches (mm)

Port Size	A	B	C	D	E	F	G	H
1/4 to 1/2	3.6 (90)	6.9 (175)	3.1 (79)	7.1 (181)	3.1 (79)	3.9 (99)	7.5 (191)	3.9 (99)
1/2 to 1	4.6 (116)	7.6 (193)	3.1 (79)	7.9 (201)	3.6 (91)	4.6 (117)	9.5 (241)	5.3 (134)
1 to 1-1/2	6.6 (168)	10.3 (263)	4.1 (104)	10.3 (263)	4.8 (123)	6.5 (165)	10.8 (274)	8.3 (211)
1-1/2 to 2-1/2	8.6 (219)	11.8 (300)	5.1 (130)	12.3 (313)	6.3 (161)	—	—	—

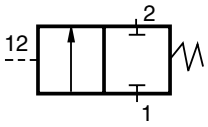
Series 27 Remote Air Pilot Inline Valves

2/2 Valves

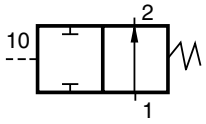


Port Size	Valve Model Numbers Normally Closed	Normally Open	Average C_v N.C.	N.O.	Weight lb. (kg)
1/4	2751A2001	2752A2001	2.3	2.3	
3/8	2751A3001	2752A3001	3.8	3.3	1.3 (0.6)
1/2	2751A4011	2752A4011	4.0	3.5	
1/2	2751A4001	2752A4001	7.7	6.5	
3/4	2751A5001	2752A5001	9.0	7.3	2.0 (0.9)
1	2751A6011	2752A6011	9.0	7.9	
1	2751A6001	2752A6001	24	21	
1-1/4	2751A7001	2752A7001	29	20	8.0 (3.6)
1-1/2	2751A8011	2752A8011	29	21	
1-1/2	2751A8001	2752A8001	49	49	
2	2751A9001	2752A9001	57	57	14.3 (6.4)
2-1/2	2751A9011	2752A9011	64	72	

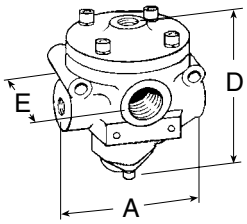
Normally Closed



Normally Open

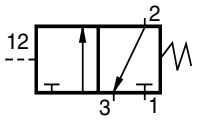


3/2 Valves

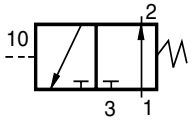


Port Sizes In-Out	Exh.	Valve Model Numbers Normally Closed	Normally Open	Average C_v N.C.	N.O.	Weight lb. (kg)
1/4	1/2	2753A2001	2754A2001	2.8	2.5	
3/8	1/2	2753A3001	2754A3001	4.0	3.0	1.3 (0.6)
1/2	1/2	2753A4011	2754A4011	3.8	3.0	
1/2	1	2753A4001	2754A4001	7.8	7.2	
3/4	1	2753A5001	2754A5001	9.4	7.2	2.0 (0.9)
1	1	2753A6011	2754A6011	10	7.2	
1	1-1/2	2753A6001	2754A6001	29	21	
1-1/4	1-1/2	2753A7001	2754A7001	31	22	6.0 (2.7)
1-1/2	1-1/2	2753A8011	2754A8011	31	21	
1-1/2	2-1/2	2753A8001	2754A8001	69	58	
2	2-1/2	2753A9001	2754A9001	70	60	15.3 (6.9)
2-1/2	2-1/2	2753A9011	2754A9011	71	55	

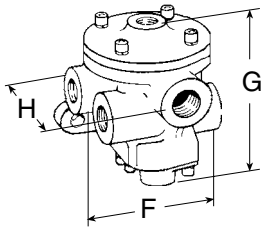
Normally Closed



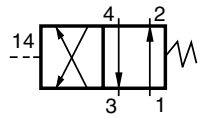
Normally Open



4/2 Valves



Port Sizes In-Out	Exhaust	Valve Model Numbers	Average C_v	Weight lb. (kg)
1/4	1/2	2756A2001	2.5	
3/8	1/2	2756A3001	3.6	1.8 (0.8)
1/2	1/2	2756A4011	3.7	
1/2	1	2756A4001	6.9	
3/4	1	2756A5001	8.2	4.3 (1.9)
1	1	2756A6011	8.9	
1	1-1/2	2756A6001	23	
1-1/4	1-1/2	2756A7001	24	10.3 (4.6)
1-1/2	1-1/2	2756A8011	25	



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 1-1/2 Port Sizes:* 15 to 150 psig (1 to 10 bar). *1-1/2 to 2-1/2 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 81.

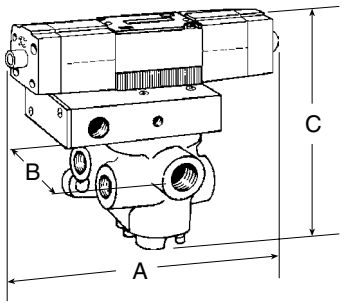
IMPORTANT NOTE
Please read carefully and thoroughly all of the **CAUTIONS** on page 82.

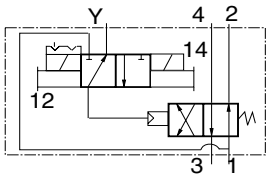
OVERALL DIMENSIONS inches (mm)

Port Size	A	B	C	D	E	F	G	H
1/4 to 1/2	3.6 (90)	3.7 (94)	3.0 (77)	4.0 (101)	3.1 (79)	3.9 (99)	4.0 (101)	3.9 (99)
1/2 to 1	4.6 (116)	4.4 (112)	3.0 (77)	4.7 (120)	3.6 (91)	4.6 (117)	5.8 (147)	5.3 (134)
1 to 1-1/2	6.6 (168)	7.4 (188)	4.1 (104)	7.4 (188)	4.8 (123)	6.5 (165)	7.5 (190)	8.3 (211)
1-1/2 to 2-1/2	8.6 (219)	9.1 (231)	5.1 (130)	9.5 (240)	6.3 (161)	6.5 (165)	7.8 (198)	8.2 (208)

Series 27 Double Solenoid Pilot Inline Valves

4/2 Valves





OVERALL DIMENSIONS inches (mm)

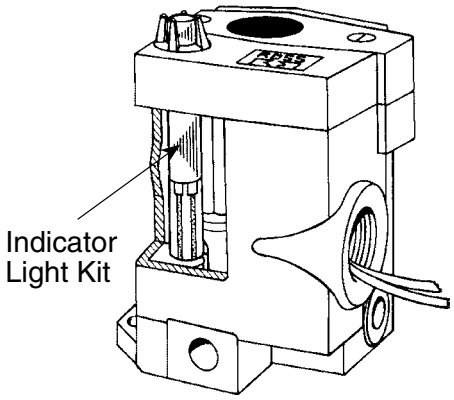
Port Size	A	B	C
1/4 to 1/2	9.4 (239)	3.9 (99)	7.9 (201)
1/2 to 1	9.4 (239)	5.3 (134)	9.7 (246)
1 to 1-1/2	9.4 (239)	8.2 (208)	11.6 (295)

IMPORTANT NOTE
Please read carefully and thoroughly all of the **CAUTIONS** on page 82.

Port Sizes In-Out	Port Sizes Exhaust	Valve Model Numbers	Average C_v	Weight lb. (kg)
1/4	1/2	2776B2003	2.5	
3/8	1/2	2776B3003	3.6	4.0 (1.8)
1/2	1/2	2776B4013	3.7	
1/2	1	2776B4003	6.9	
3/4	1	2776B5003	8.2	6.3 (2.8)
1	1	2776B6013	8.9	
1	1-1/2	2776B6003	23	
1-1/4	1-1/2	2776B7003	24	12.3 (5.5)
1-1/2	1-1/2	2776B8013	25	

STANDARD SPECIFICATIONS: For valves on this page.
Solenoids: AC or DC power. See page 81 for voltages.
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 81.

Indicator Light Kit



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

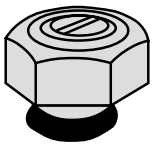
An indicator light is available in kit form for single solenoid models in Series 16, Series 21 (type O only), and Series 27. Order kit number **862K87** and specify the voltage of the solenoid.

Manual Override Kits

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

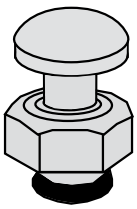
Each of the buttons in the override kits below is made of metal and is spring-returned. The locking type button, however, can be kept in the actuated position by turning the slot in the top of the button with a screwdriver.

Order by the kit numbers shown below.

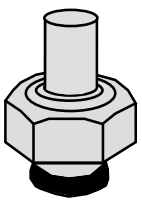


FLUSH BUTTON
Locking type ..... **Kit 792K87**
Non-locking type ..... **Kit 790K87**

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



EXTENDED BUTTON
Non-locking type
Kit 791K87

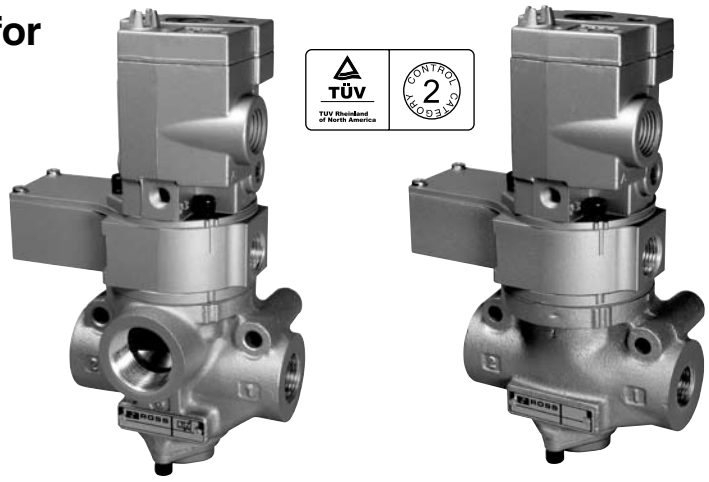


Series SV27 Sensing Valves

Position and State Sensing Feedback for Category-2 Safety Applications

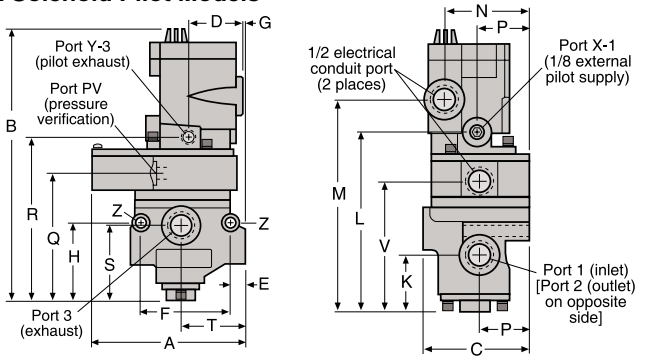
ROSS' new Series SV27 Sensing Valves, based upon the proven Series 27 valve family, combine the tough, dirt tolerant characteristics of poppet technology with sensing for actual poppet position and state. Electrical feedback is provided via a positively-driven, safety-rated DPST (double pole, double throw) switch with both normally open (NO) and normally closed (NC) 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). These new Sensing Valves are available in 2/2 and 3/2 normally closed functions with single solenoid pilot or remote air pilot actuation.

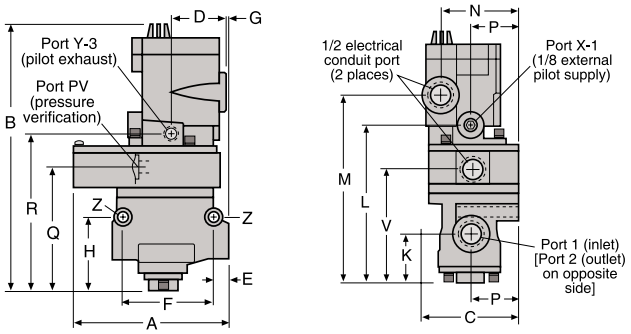


2/2 and 3/2 Normally Closed, Solenoid Pilot Models

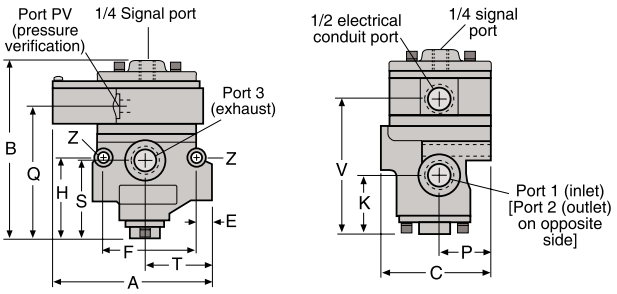
3/2 Solenoid Pilot Models



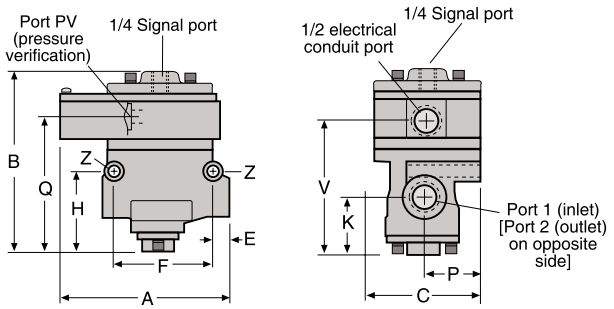
2/2 Solenoid Pilot Models



3/2 Remote Air Pilot Models



2/2 Remote Air Pilot Models



Dimensions inches (mm)

	3/2 Sol.	2/2 Sol.	3/2 Rem.	2/2 Rem.
A	5.70 (145)	5.70 (145)	5.70 (145)	5.70 (145)
B	9.57 (244)	9.25 (235)	6.40 (163)	6.10 (155)
C	3.03 (77)	3.03 (77)	3.59 (91)	3.11 (79)
D	1.26 (32)	1.26 (32)	–	–
E	0.66 (17)	0.66 (17)	0.66 (17)	0.66 (17)
F	3.25 (83)	3.25 (83)	3.25 (83)	3.25 (83)
G	0.86 (22)	0.86 (22)	–	–
H	3.13 (80)	2.73 (69)	3.05 (77)	2.74 (70)
K	2.19 (56)	1.80 (46)	2.11 (54)	1.80 (46)
L	6.53 (166)	6.20 (158)	–	–

	3/2 Sol.	2/2 Sol.	3/2 Rem.	2/2 Rem.
M	7.52 (191)	7.20 (183)	–	–
N	2.45 (62)	2.45 (62)	–	–
P	1.53 (39)	1.53 (39)	1.53 (39)	1.53 (39)
Q	4.74 (120)	4.42 (112)	4.74 (120)	4.42 (112)
R	6.27 (159)	5.96 (151)	–	–
S	3.03 (77)	–	2.95 (75)	–
T	2.38 (60)	–	2.38 (60)	–
V	4.60 (117)	4.28 (109)	4.60 (117)	4.28 (109)
Z	0.34 (8)	0.34 (8)	0.34 (8)	0.34 (8)

Series SV27 Sensing Valves

Solenoid Pilot Operated Models

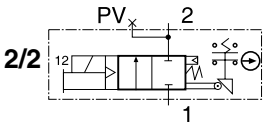
Model Numbers*	Valve Function	Port Size		C_v		Average Response Constant			Weight
		1, 2	3	1 - 2	2 - 3	M	In - Out	Out - Exh.	lbs (kg)
SV27-N-A-30-5-40-7PS-AA-1A**	3/2 Normally Closed	1/2	1	6.3	9.2	19	0.38	0.44	4.5 (2.0)
SV27-N-A-30-5-50-7PS-AA-1A**		3/4	1	7.7	11	19	0.38	0.44	4.5 (2.0)
SV27-N-A-30-5-60-7PS-AA-1A**		1	1	8.0	12	19	0.38	0.44	4.5 (2.0)
SV27-N-A-10-5-40-7PS-AA-1A**	2/2 Normally Closed	1/2	–	7.7	N/A	20	0.45	N/A	4.6 (2.1)
SV27-N-A-10-5-50-7PS-AA-1A**		3/4	–	9.0	N/A	20	0.45	N/A	4.6 (2.1)
SV27-N-A-10-5-60-7PS-AA-1A**		1	–	9.0	N/A	20	0.45	N/A	4.6 (2.1)

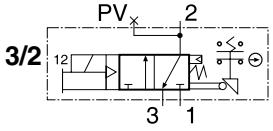
Remote Air Pilot Operated Models

SV27-N-A-30-5-40-5AS-AA	3/2 Normally Closed	1/2	1	6.3	9.2	19	0.38	0.44	3.3 (1.5)
SV27-N-A-30-5-50-5AS-AA		3/4	1	7.7	11	19	0.38	0.44	3.3 (1.5)
SV27-N-A-30-5-60-5AS-AA		1	1	8.0	12	19	0.38	0.44	3.3 (1.5)
SV27-N-A-10-5-40-5AS-AA	2/2 Normally Closed	1/2	–	7.7	N/A	20	0.45	N/A	3.4 (1.6)
SV27-N-A-10-5-50-5AS-AA		3/4	–	9.0	N/A	20	0.45	N/A	3.4 (1.6)
SV27-N-A-10-5-60-5AS-AA		1	–	9.0	N/A	20	0.45	N/A	3.4 (1.6)

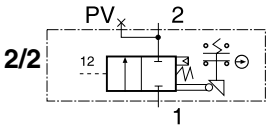
*Models listed above have NPT port threads. For G thread type, replace "N" in the model number with a "D." Models with SAE threads also available – consult ROSS. **Solenoid pilot models above have 120v/60Hz solenoids. Change "1A" in model to "2A" for 240v/60, "3A" for 24v/60, or "1D" for 24 vdc.

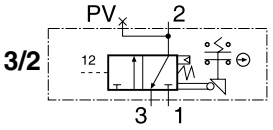
SOLENOID PILOT



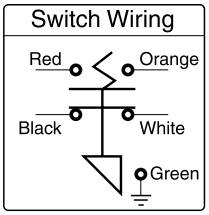


REMOTE AIR PILOT

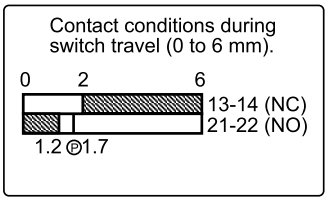




Ingtegral Double Pole Single Throw Switch (DPST)

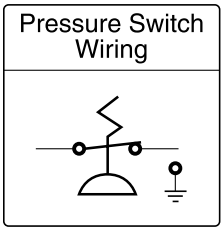


Schematic & Pinout



Switch States

Optional Pressure Switch Kit (608A86)



Schematic

STANDARD SPECIFICATIONS:

Pilot Solenoid: Rated for continuous duty.
Standard Voltages: 100 – 110 volts 50 Hz; 100 – 120 volts 60 Hz; 24, 110 volts DC
Other voltages available.
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: Electrical life of switch varies with conditions and voltage; rated in excess of 15 million cycles.

Flow Media: Filtered air.
Inlet Pressure: 40 to 150 psig (2.8 to 10 bar).
Pilot Pressure: Equal to or greater than inlet pressure.
Switch Current/Voltage Max.: 2.5 A / 120 VAC.
Switch Current/Voltage Min.: 50 mA / 24 VDC.

IMPORTANT NOTE
Please read carefully and thoroughly all of the **CAUTIONS** on page 82.

ROSS 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 on the previous page, 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.

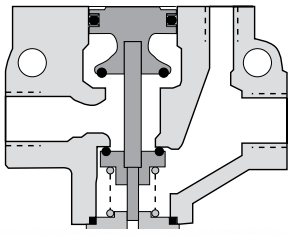
Solenoid models listed in this catalog use an internal pilot supply. They are, however, easily field-convertible for use with an external pilot supply. Models for external pilot supply may also be ordered from ROSS.

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).

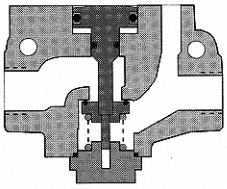
Vacuum Service: The construction of Series 21 valves makes them readily adaptable to vacuum service. For details consult your ROSS distributor or ROSS Technical Services. The telephone number for Technical Services in the U.S.A. is 1-888-TEK-ROSS (835-7677) or 1-706-356-3600.

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

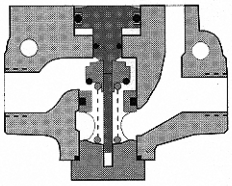


O-ring piston seals have Teflon® wear rings top and bottom. Inlet and exhaust poppets have spun-in O-ring seals.

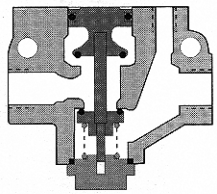
Series 21 Valve Bodies



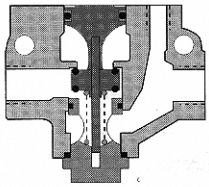
2-Way, Normally-Closed
1/4 to 1 1/2
Series 21H, 21O



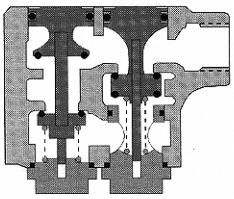
2-Way, Normally-Open
1/4 to 1 1/2
Series 21H, 21O



3-Way, Normally-Closed
1/4 to 1 1/2
Series 21H, 21O

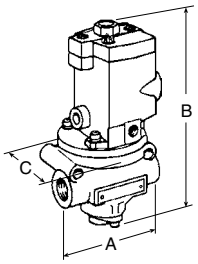


3-Way, Normally-Open
1/4 to 1 1/2
Series 21H, 21O



4-Way,
1/4 to 1 1/2
Series 21H, 21O

Series 21 Single Solenoid Pilot Inline Valves



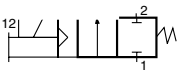
2/2 Valves

VALVE MODEL NUMBERS for TYPE H (High Temperature) SERVICE

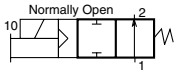
Port Size In-Out	Exh.	2/2 Valves Normally Closed	2/2 Valves Normally Open	3/2 Valves Normally Closed	3/2 Valves Normally Open	4/2 Valves	Weight lb. (kg)
1/4	1/2	2171B2001	2172B2001	2173B2001	2174B2001	2176B2001	
3/8	1/2	2171B3001	2172B3001	2173B3001	2174B3001	2176B3001	3.0 (1.4)
1/2	1/2	2171B4011	2172B4011	2173B4011	2174B4011	2176B4011	
1/2	1	2171B4001	2172B4001	2173B4001	2174B4001	2176B4001	
3/4	1	2171B5001	2172B5001	2173B5001	2174B5001	2176B5001	3.3 (1.5)
1	1	2171B6011	2172B6011	2173B6011	2174B6011	2176B6011	
1	1-1/2	2171B6001	2172B6001	2173B6001	2174B6001	2176B6001	
1-1/4	1-1/2	2171B7001	2172B7001	2173B7001	2174B7001	2176B7001	7.5 (3.4)
1-1/2	1-1/2	2171B8011	2172B8011	2173B8011	2174B8011	2176B8011	

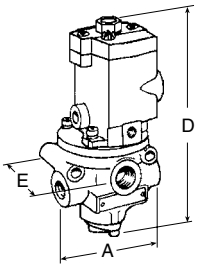
2-Way

Normally Closed



Normally Open

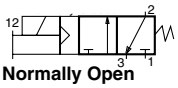




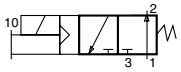
3/2 Valves

3-Way

Normally Closed

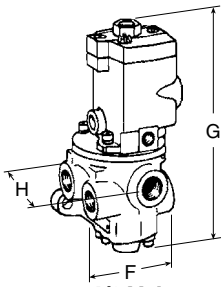


Normally Open



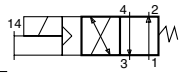
VALVE MODEL NUMBERS for TYPE O (Low Temperature) SERVICE

Port Size In-Out	Exh.	2/2 Valves Normally Closed	2/2 Valves Normally Open	3/2 Valves Normally Closed	3/2 Valves Normally Open	4/2 Valves	Weight lb. (kg.)
1/4	1/2	2171B2002	2172B2002	2173B2002	2174B2002	2176B2002	
3/8	1/2	2171B3002	2172B3002	2173B3002	2174B3002	2176B3002	3.0 (1.4)
1/2	1/2	2171B4012	2172B4012	2173B4012	2174B4012	2176B4012	
1/2	1	2171B4002	2172B4002	2173B4002	2174B4002	2176B4002	
3/4	1	2171B5002	2172B5002	2173B5002	2174B5002	2176B5002	5.8 (2.6)
1	1	2171B6012	2172B6012	2173B6012	2174B6012	2176B6012	
1	1-1/2	2171B6002	2172B6002	2173B6002	2174B6002	2176B6002	
1-1/4	1-1/2	2171B7002	2172B7002	2173B7002	2174B7002	2176B7002	12.0 (5.4)
1-1/2	1-1/2	2171B8012	2172B8012	2173B8012	2174B8012	2176B8012	



4/2 Valves

4-Way



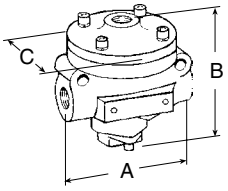
STANDARD SPECIFICATIONS: For valves on this page.
Solenoids: AC or DC power. See page 81 for voltages.
Power Consumption: 87 VA inrush, 30 VA holding on 50 or 60 Hz; 14 watts on DC.
Manual Override: Non-locking metal button.
Ambient Temperature: *Type H:* 0° to 250°F (-17° to 122°C).
Type O: –40° to 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 81.
Average C_V: Ratings see corresponding Series 27 models on page 35.

IMPORTANT NOTE
Please read carefully and thoroughly all of the **CAUTIONS** on page 82.

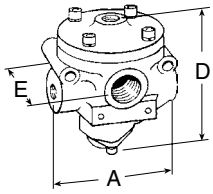
OVERALL DIMENSIONS inches (mm)

Port Size	A	B	C	D	E	F	G	H
1/4 to 1/2	3.6 (90)	7.0 (178)	3.0 (76)	7.3 (186)	3.6 (92)	3.8 (97)	7.7 (196)	3.9 (99)
1/2 to 1	4.6 (116)	7.7 (196)	3.0 (76)	8.0 (203)	4.6 (117)	5.2 (132)	9.7 (246)	4.6 (104)
1 to 1-1/2	6.6 (168)	10.5 (266)	4.1 (104)	10.5 (266)	6.6 (168)	8.2 (208)	11.1 (282)	6.5 (165)

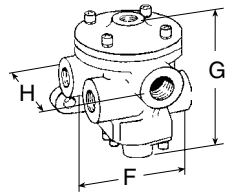
Series 21 Pressure Controlled Inline Valves



2/2 Valves



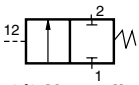
3/2 Valves



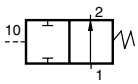
4/2 Valves

VALVE MODEL NUMBERS for TYPE H (High Temperature) SERVICE

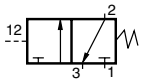
Port Size In-Out	Exh.	2/2 Valves Normally Closed	2/2 Valves Normally Open	3/2 Valves Normally Closed	3/2 Valves Normally Open	4/2 Valves	Weight lb. (kg)
1/4	1/2	2151B2001	2152B2001	2153B2001	2154B2001	2156B2001	
3/8	1/2	2151B3001	2152B3001	2153B3001	2154B3001	2156B3001	1.8 (0.8)
1/2	1/2	2151B4011	2152B4011	2153B4011	2154B4011	2156B4011	
1/2	1	2151B4001	2152B4001	2153B4001	2154B4001	2156B4001	
3/4	1	2151B5001	2152B5001	2153B5001	2154B5001	2156B5001	4.5 (2.0)
1	1	2151B6011	2152B6011	2153B6011	2154B6011	2156B6011	
1	1-1/2	2151B6001	2152B6001	2153B6001	2154B6001	2156B6001	
1-1/4	1-1/2	2151B7001	2152B7001	2153B7001	2154B7001	2156B7001	11.0 (5.0)
1-1/2	1-1/2	2151B8011	2152B8011	2153B8011	2154B8011	2156B8011	



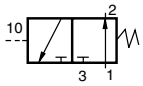
2/2 Normally Closed



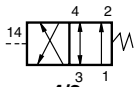
2/2 Normally Open



3/2 Normally Closed



3/2 Normally Open



4/2

VALVE MODEL NUMBERS for TYPE O (Low Temperature) SERVICE

Port Size In-Out	Exh.	2/2 Valves Normally Closed	2/2 Valves Normally Open	3/2 Valves Normally Closed	3/2 Valves Normally Open	4/2 Valves	Weight lb. (kg)
1/4	1/2	2151B2002	2152B2002	2153B2002	2154B2002	2156B2002	
3/8	1/2	2151B3002	2152B3002	2153B3002	2154B3002	2156B3002	1.8 (0.8)
1/2	1/2	2151B4012	2152B4012	2153B4012	2154B4012	2156B4012	
1/2	1	2151B4002	2152B4002	2153B4002	2154B4002	2156B4002	
3/4	1	2151B5002	2152B5002	2153B5002	2154B5002	2156B5002	4.5 (2.0)
1	1	2151B6012	2152B6012	2153B6012	2154B6012	2156B6012	
1	1-1/2	2151B6002	2152B6002	2153B6002	2154B6002	2156B6002	
1-1/4	1-1/2	2151B7002	2152B7002	2153B7002	2154B7002	2156B7002	11.0 (5.0)
1-1/2	1-1/2	2151B8012	2152B8012	2153B8012	2154B8012	2156B8012	

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 81.
For **Average C_V** ratings see corresponding Series 27 models on page 36.

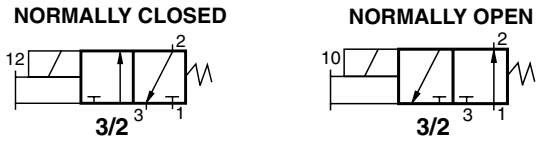
IMPORTANT NOTE
Please read carefully and thoroughly all of the **CAUTIONS** on page 82.

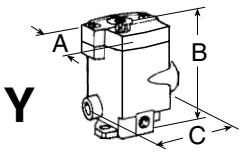
OVERALL DIMENSIONS inches (mm)

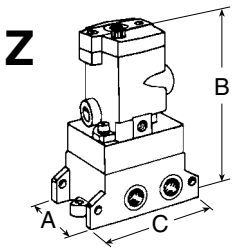
Port Size	A	B	C	D	E	F	G	H
1/4 to 1/2	3.6 (90)	3.7 (94)	3.0 (77)	4.0 (101)	3.1 (79)	3.9 (99)	4.0 (101)	3.9 (99)
1/2 to 1	4.6 (116)	4.4 (112)	3.0 (77)	4.7 (120)	3.6 (91)	4.6 (117)	5.8 (147)	5.3 (134)
1 to 1-1/2	6.6 (168)	7.5 (190)	4.1 (104)	7.5 (190)	4.8 (123)	6.5 (165)	7.5 (190)	8.3 (211)

Series 16 Compact Valves

3/2 Valves – Single Direct Solenoid



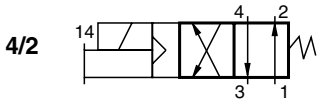




Port Size	Valve Type	Avg. C_v	Valve Model Numbers Normally Closed	Normally Open	Dimensions inches (mm) A	B	C	Weight lb. (kg)
1/8	Y	0.3	1613B1020	1614B1020	2.7 (69)	3.8 (95)	3.0 (77)	1.4 (0.6)
1/4	Y	0.3	1613B2020	1614B2020	2.7 (69)	3.8 (95)	3.0 (77)	1.4 (0.6)
1/4	Z	0.3	1613C2322*	1614B2322*	2.7 (69)	6.6 (168)	4.2 (107)	1.4 (0.6)

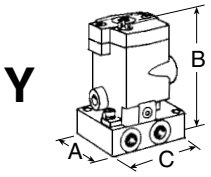
*Also order manifold 256B91 (not included with this valve).

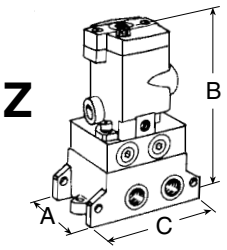
4/2 Valves – Single Solenoid Pilot



Port Size	Valve Type	Valve Model Numbers	Average C_v	Weight lb. (kg.)
1/4	Y	1616C2020	0.4	2.4 (1.1)
1/4	Z	1616C2322*	0.4	2.4 (1.1)

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





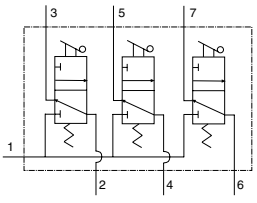
STANDARD SPECIFICATIONS: *For Series 16 valves.*
Solenoids: AC or DC power. See page 81 for voltages.
Power Consumption: 87 VA inrush, 30 VA holding on 50 or 60 Hz; 14 watts on DC.
Ambient Temperature: 40° to 120°F (4° to 50°C).
Media Temperature: 40° to 175°F (4° to 80°C).
Flow Media: Filtered air. 5 micron recommended.
Inlet Pressure: *3/2 Valves:* 5 to 150 psig (0.3 to 10 bar).
4/2 Valves: 30 to 150 psig (2 to 10 bar).
For Pendant Controls:
Ambient & Media Temperature, Flow Media: Same as above.
Inlet Pressure: 0 to 150 psig (0 to 10 bar).

IMPORTANT NOTE
Please read carefully and thoroughly all of the **CAUTIONS** on page 82.

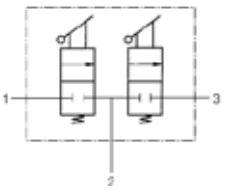
Series 16 OVERALL DIMENSIONS inches (mm)

Valve Type	A	B	C
Y (3/2)	2.7 (69)	3.8 (95)	3.0 (77)
Y (4/2)	2.7 (69)	4.8 (121)	3.1 (78)
Z	2.63 (66.6)	6.6 (168)	4.2 (107)

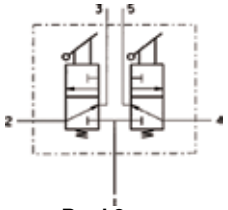
Pendant Control Valves



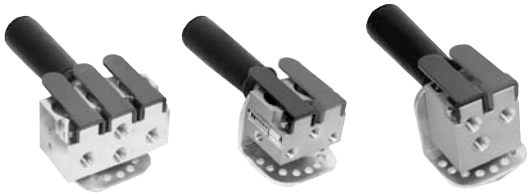
Triple 3-way



Dual 2-way



Dual 3-way

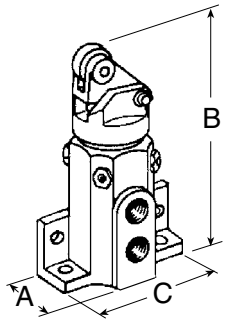


ROSS Pendant Control valves are a durable pneumatic solution that can be used anywhere manual control of devices is needed, such as an air hoist, air motor, or counterbalance cylinder. Ideal for use on or with material handling devices such as overhead cranes or air hoists, ROSS Pendant Control valves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

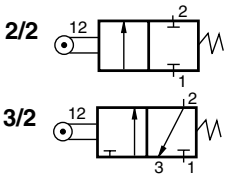
Model Description	Pipe Sizes	Numbers	1-2 C_v	2-3 C_v	Weight lb. (kg)
Dual 3-way, no levers/handle	1/8"	1442H75	0.24	0.42	0.7 (0.3)
Dual 2-way high flow, no levers/handle	1/4"	1443H75	0.73	0.55	0.8 (0.4)
Triple 3-way, no levers/handle	1/4"	1466H75	0.24	0.42	1.2 (0.5)
Dual 3-way; two levers only	1/8"	2025A1900	0.24	0.42	0.9 (0.4)
Dual 3-way; two levers/handle	1/8"	3900A0379	0.24	0.42	1.6 (0.7)
Dual 2-way high flow; two levers only	1/4"	2025A2901	0.73	0.55	1.0 (0.5)
Dual 2-way high flow; two levers/handle	1/4"	3900A0378	0.73	0.55	1.7 (0.8)
Triple 3-way; three levers only	1/4"	2025A2902	0.24	0.42	1.6 (0.7)
Triple 3-way; three levers/handle	1/4"	3900A0407	0.24	0.42	2.3 (1.0)

Series 11 & 12 Cam and Manual Valves

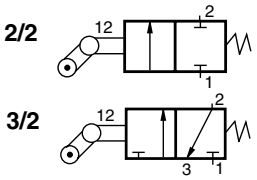
2/2 and 3/2 Cam Valves



ROLLER

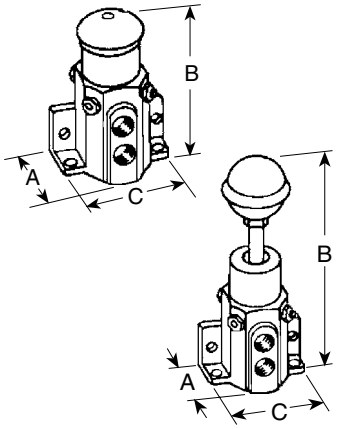


1-WAY ROLLER

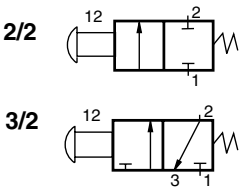


Port Size	Valve Type	Valve Model Numbers	Average C_v	Dimensions inches (mm) A	B	C	Weight lb. (kg)
1/4	2/2 - Roller	1131A2001	0.5	1.82 (46)	4.37 (111)	2.76 (70)	1.0 (0.5)
1/4	3/2 - Roller	1133A2001	0.5	1.82 (46)	4.37 (111)	2.76 (70)	1.0 (0.5)
1/4	2/2 - 1-Way Roller	1131A2002	0.5	1.82 (46)	4.50 (114)	2.76 (70)	1.0 (0.5)
1/4	3/2 - 1-Way Roller	1133A2002	0.5	1.82 (46)	4.50 (114)	2.76 (70)	1.0 (0.5)

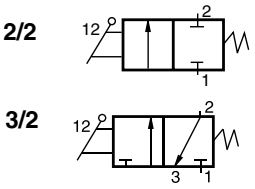
2/2 and 3/2 Lever and Pushbutton Valves



PUSHBUTTON

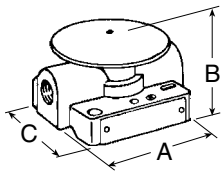


TOGGLE

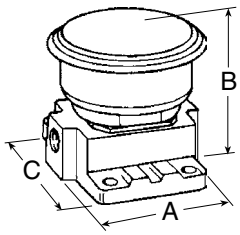


Port Size	Valve Type	Valve Model Numbers	Average C_v	Dimensions inches (mm) A	B	C	Weight lb. (kg)
1/4	2/2 - Pushbutton	1121A2001	0.5	1.82 (46)	3.27 (83)	2.76 (70)	1.0 (0.5)
1/4	3/2 - Pushbutton	1123A2001	0.5	1.82 (46)	3.27 (83)	2.76 (70)	1.0 (0.5)
1/4	2/2 - Toggle	1121A2002	0.5	1.82 (46)	5.92 (150)	2.76 (70)	1.0 (0.5)
1/4	3/2 - Toggle	1123A2002	0.5	1.82 (46)	5.92 (150)	2.76 (70)	1.0 (0.5)

2/2 and 3/2 Pushbutton Valves

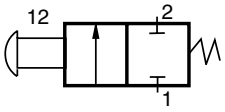


RD- Regular Duty

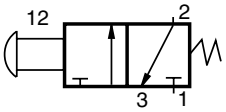


HD- Heavy Duty

2/2



3/2



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

Ring-type Guard: Helps to protect against accidental valve actuation. Order by following part numbers:

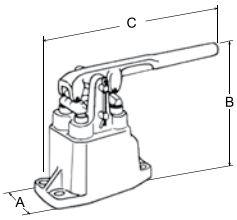
For RD valves: 279B30
For HD valves: 278B30

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 page 82.

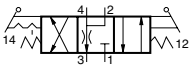
Series 31 & 36 Manual Valves

4/3 Lever Valves

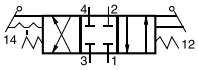


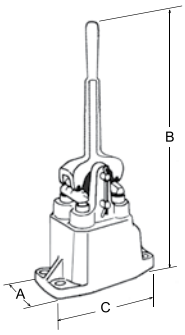
3 Positions,
All Ports on Bottom Face

OPEN CENTER



CLOSED CENTER

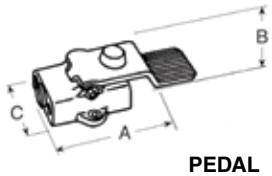




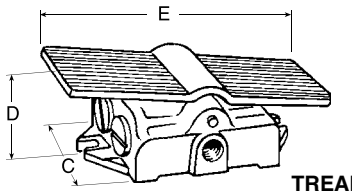
Port Size	Valve Model Numbers	Avg. C_v	Closed/Open Center	Dimensions inches (mm) A	B	C	Weight lb. (kg)
3/8	3126A3007	1.6	Open	2.12 (54)	4.40 (112)	8.06 (205)	2.0 (.9)
3/8	3126A3010	1.6	Closed	2.12 (54)	4.40 (112)	8.06 (205)	2.0 (.9)
1/2	3126A4007	2.6	Open	2.75 (70)	5.53 (140)	11.16 (284)	3.8 (1.7)
1/2	3126A4010	2.6	Closed	2.75 (70)	5.53 (140)	11.16 (284)	3.8 (1.7)
3/4	3126A5007	4.6	Open	3.25 (83)	6.15 (156)	12.48 (317)	5.0 (2.3)
3/4	3126A5010	4.6	Closed	3.25 (83)	6.15 (156)	12.48 (317)	5.0 (2.3)
1	3126A6007	8.8	Open	4.13 (105)	7.94 (202)	18.63 (473)	10.0 (4.5)
1	3126A6010	8.8	Closed	4.13 (105)	7.94 (202)	18.63 (473)	10.0 (4.5)
1-1/4	3126A7007	12	Open	4.75 (121)	8.16 (207)	18.75 (476)	11.0 (5.0)
1-1/4	3126A7010	12	Closed	4.75 (121)	8.16 (207)	18.75 (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

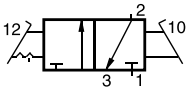


PEDAL

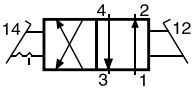


TREADLE

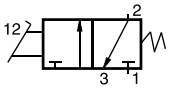
3/2



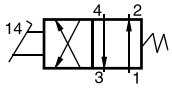
4/2



3/2

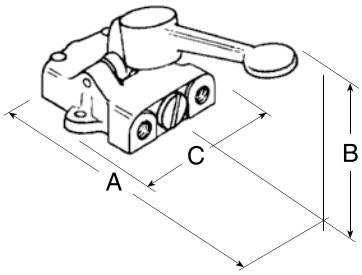


4/2

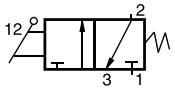


Port Size	Valve Type	Valve Model Numbers	Avg. C_v	Dimensions inches (mm) A	B	C	D	E	Weight lb. (kg)
1/4	3/2 — Pedal	3643A2002	1.2	6.35 (161)	2.55 (65)	3.44 (87)	1.90 (48)	6.00 (152)	1.3 (.6)
1/4	3/2 — Treadle	3643A2001	1.2	6.35 (161)	2.55 (65)	3.44 (87)	1.90 (48)	6.00 (152)	1.3 (.6)
1/4	4/2 — Pedal	3646A2002	1.2	7.19 (183)	2.87 (73)	3.65 (93)	2.50 (64)	6.50 (165)	2.8 (1.3)
1/4	4/2 — Treadle	3646A2001	1.2	7.19 (183)	2.87 (73)	3.65 (93)	2.50 (64)	6.50 (165)	2.8 (1.3)

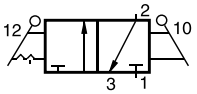
3/2 and 4/2 Lever Valves



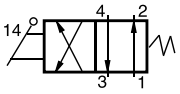
3/2 Valve Illustrated



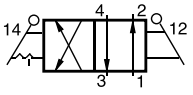
3/2 Spring Return



3/2 Detented



4/2 Spring Return



4/2 Detented

Port Size	Valve Type	Valve Model Numbers*	Avg. C_v	Dimensions inches (mm) A	B	C	Weight lb. (kg)
1/4	3/2 — Detented	3623A2003	1.2	7.16 (182)	3.20 (81)	3.44 (87)	1.3 (0.6)
1/4	3/2 — Spring return	3623A2004	1.2	7.16 (182)	3.20 (81)	3.44 (87)	1.3 (0.6)
1/4	4/2 — Detented	3626A2003	1.2	7.87 (200)	3.81 (97)	3.65 (93)	2.5 (1.1)
1/4	4/2 — Spring return	3626A2004	1.2	7.87 (200)	3.81 (97)	3.65 (93)	2.5 (1.1)

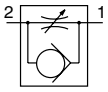
*For models with vertical handle, consult ROSS.

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: 30 to 125 psig (0.3 to 8.5 bar).

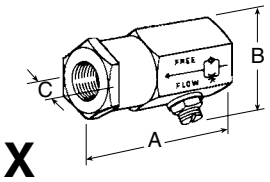
IMPORTANT NOTE
Please read carefully and thoroughly all of the **CAUTIONS** on page 82.

Flow Control Valves

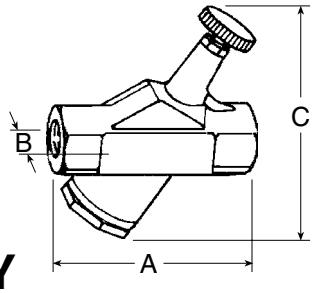
Flow Control Valves



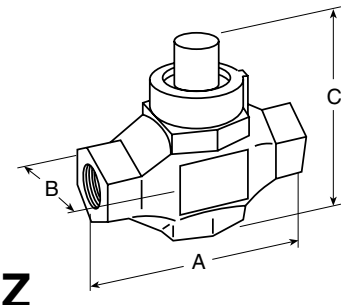
Flow control valves are used to control air flow from air cylinders, thereby controlling the speeds at which the pistons in the cylinders move. They allow free flow in one direction and adjustable, precision controlled flow in the other direction. Adjustment in the X-type models is by means of a screwdriver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



X



Y



Z

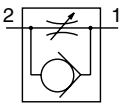
Valve Type	Port Size	Valve Model Number	Avg. C_v (Fully open)	Dimensions inches (mm) A	B	C	Weight lb. (kg)
X	1/8	1968D1004	0.5	2.4 (62)	1.3 (33)	1.0 (25)	0.5 (0.2)
	1/4	1968D2004	0.5	2.4 (62)	1.3 (33)	1.0 (25)	0.5 (0.2)
	3/8	1968D3014	0.5	2.4 (62)	1.3 (33)	1.0 (25)	0.5 (0.2)
Y	1/4	1968B2007	2.3	3.5 (89)	1.3 (33)	4.3 (108)	0.5 (0.2)
	3/8	1968B3007	2.6	3.5 (89)	1.3 (33)	4.3 (108)	0.5 (0.2)
	1/2	1968B4017	2.6	3.5 (89)	1.3 (33)	4.3 (108)	0.5 (0.2)
Y	1/2	1968B4007	7.5	4.8 (121)	1.8 (45)	5.6 (142)	0.8 (0.4)
	3/4	1968B5007	8.3	4.8 (121)	1.8 (45)	5.6 (142)	0.8 (0.4)
	1	1968B6017	8.3	4.8 (121)	1.8 (45)	5.6 (142)	0.8 (0.4)
Y	1	1968B6007	17	5.4 (130)	2.3 (57)	7.1 (181)	2.2 (1.0)
	1-1/4	1968B7007	22	5.4 (130)	2.3 (57)	7.1 (181)	2.2 (1.0)
	1-1/2	1968B8017	22	5.4 (130)	2.3 (57)	7.1 (181)	2.2 (1.0)
Y	1-1/2	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)
	2-1/2	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)	
	3/4	1968E5007	8.3				
Z	1	1968E6007	17	5.0 (127)	2.5 (64)	4.5 (113)	2.1 (1.0)
	1-1/4	1968E7007	22				

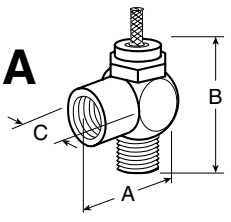
Right Angle Flow Control Valves

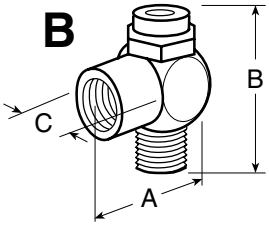
Right angle flow control valves function like those described above. However, their compact right angle design permits use where conventional straight-through flow controls might be undesirable.

Flow adjustment is achieved by means of either a screwdriver slot or a knurled knob.

Models listed in the chart at the right 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 A	B	C	Weight lb. (kg)
1/8	Slot (**B**)	1968A1008*	0.3	1.1 (27)	1.3 (32)	0.59 (15)	.06 (.03)
	Knob (**A**)	1968A1018*	0.3	1.1 (27)	1.9 (48)	0.59 (15)	.08 (.04)
1/4	Slot (**B**)	1968A2008*	0.6	1.3 (33)	1.6 (41)	0.75 (19)	.12 (.05)
	Knob (**A**)	1968A2018*	0.6	1.3 (33)	2.3 (59)	0.75 (19)	.14 (.06)
3/8	Slot (**B**)	1968A3008*	1.9	1.6 (44)	1.9 (47)	0.91 (23)	.20 (.09)
1/2	Slot (**B**)	1968A4008	2.8	1.8 (46)	2.3 (58)	1.1 (28)	.34 (.15)

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

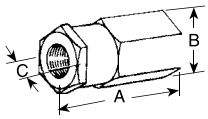
STANDARD SPECIFICATIONS: For valves on this page.
Ambient/Media Temperature: 40° to 175°F (4° to 80°C).
Flow Media: Filtered air. 5 micron recommended.
Pressure Range: 5 to 150 psig (0.3 to 10 bar).

IMPORTANT NOTE
Please read carefully and thoroughly all of the **CAUTIONS** on page 82.

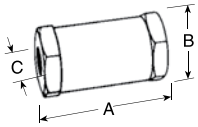
Check and Shuttle Valves

Check Valves

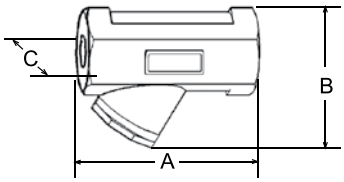
X



Y



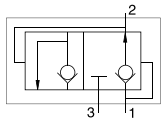
Z

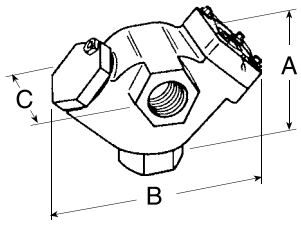


Valve Type	Port Size	Valve Model Number	Avg. C_v	Dimensions inches (mm) A	B	C	Weight lb. (kg)
X	1/8	1968D1005	0.5	2.7 (67)	1.2 (29)	1.0 (25)	0.5 (0.2)
	1/4	1968D2005	0.5				
Y	1/4	1968D2001	2.9	2.8 (71)	1.6 (40)	1.4 (35)	
	3/8	1968D3001	3.7	2.8 (71)	1.6 (40)	1.4 (35)	0.5 (0.2)
	1/2	1968D4001	3.9	3.7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

Check valves permit air flow in one direction, and are closed in the opposite direction.

Quick Exhaust Check Valves



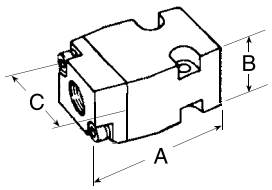


Port Size In-Out	Exh.	Valve Model Number	Avg. C_v In-Out	Out-Exh.	Dimensions inches (mm) A	B	C	Weight lb. (kg)
3/8	1/2	1868A3005	2.9	3.4	3.2 (81)	4.7 (119)	2.0 (51)	1.0 (0.5)
1/2	1/2	1868A4005	2.9	3.4	3.2 (81)	4.7 (119)	2.0 (51)	1.0 (0.5)
3/4	1	1868A5005	7.2	10	4.3 (110)	6.5 (165)	2.6 (65)	2.5 (1.1)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

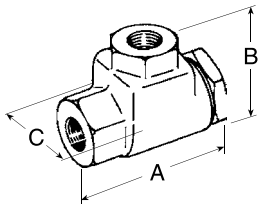
Shuttle Valves

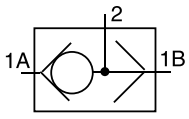
ROSS shuttle valves have two inlets and one outlet. The first inlet to be pressurized is connected to the outlet, and the second inlet is then closed. Thus, a pneumatic device connected to the shuttle outlet can be operated by either of two control valves connected to the shuttle inlets.

Y



Z





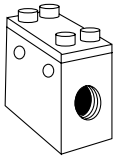
Valve Type	Port Size	Valve Model Number	Average C_v	Dimensions inches (mm) A	B	C	Weight lb. (kg)
Y	1/8	1968D1006	1.1	2.12 (54)	1.06 (27)	1.90 (48)	0.3 (0.1)
	1/4	1968D2006	1.6	2.12 (54)	1.06 (27)	1.90 (48)	0.3 (0.1)
Z	1/4	1968D2003	2.0	2.64 (67)	2.13 (54)	1.25 (32)	0.8 (0.4)
	3/8	1968D3003	3.0	2.64 (67)	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.

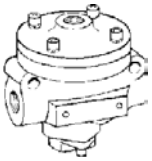
IMPORTANT NOTE
Please read carefully and thoroughly all of the **CAUTIONS** on page 82.

Check Valves

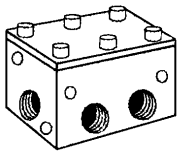
Pilot-Operated Check Valves



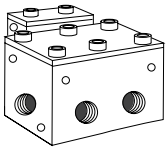
Type A Single P.O. Check Valve
Ports: 1/4, 3/8, 1/2



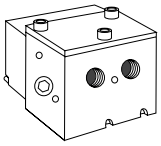
Type B Single P.O. Check Valve
Ports: 1/4 through 1-1/2



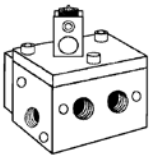
Type C Dual P.O. Check Valve
Ports: 3/8 through 1



Type D Internal Pilot Dual P.O. Check Valve (Remote Trapped Pressure Relief)
Ports: 3/8 through 1



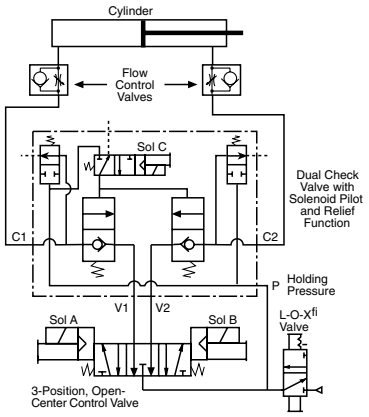
Type D Internal Pilot Dual P.O. Check Valve (Manual Trapped Pressure Relief)
Ports: 3/8 through 1



Type E Solenoid Pilot Dual P.O. Check Valve
Ports: 3/8 through 1

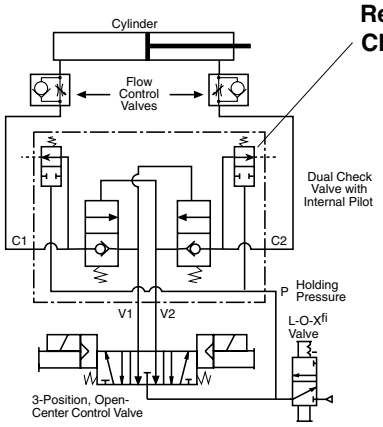
- Can be used wherever a high-flow or remotely-controlled checking function is needed.
- Can be used in a circuit to provide automatic stopping of a cylinder in the event of the loss of electrical or pneumatic power.
- Also available with an Automatic exhausting function, Remote and Manual Trapped Pressure Relief Function, or Solenoid Pilot Dual P.O. 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.

Solenoid PO Dual Check Valve Application



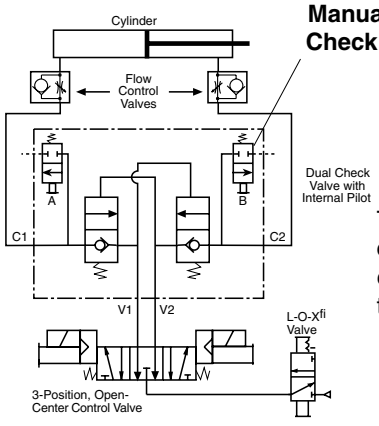
Pressure in cylinder is exhausted when the air supply at port "P" is lost or locked out.

Remote Trapped Pressure Relief



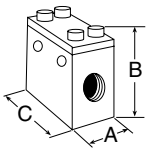
Trapped pressure between check valve and cylinder is exhausted when the air supply at "P" port is lost or locked out.

Manual Trapped Pressure Relief

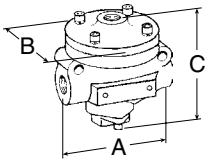


Trapped pressure between check valve and cylinder is exhausted when push buttons A and B are pressed.

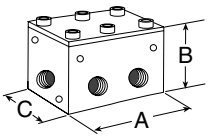
Pilot-Operated Check Valves



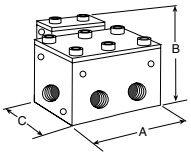
A**



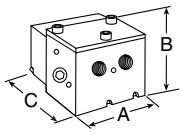
B



C**



D Remote**

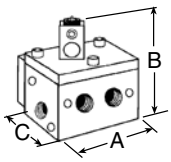


D Manual**

Valve Type	Port Size	Valve Model Number	Avg. C_V (Fully open)	Dimensions inches (mm) A	B	C	Weight lb. (kg)
A	1/4	2751A2908	2.2	1.5 (38)	3.6 (91)	2.0 (51)	2.3 (1.0)
	3/8	2751A3908	2.9	1.5 (38)	3.6 (91)	2.0 (51)	
	1/2	2751A4915	3.2	1.5 (38)	3.6 (91)	2.5 (64)	
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)	
	1/2	2751A4902	4.0	3.6 (91)	3.8 (95)	3.1 (79)	
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)	
	1	2751A6901	9.0	4.6 (116)	4.4 (112)	3.1 (79)	
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)	
	1-1/2	2751B8902	29	6.7 (169)	6.5 (165)	4.1 (104)	
C Dual	3/8	2768C3900	2.9	3.4 (89)	3.7 (94)	2.4 (61)	2.0 (0.9)
	1/2	2768C4900	3.2	3.4 (89)	3.7 (94)	2.4 (61)	2.4 (1.1)
	3/4	2768C5900	8.5	4.4 (111)	4.1 (104)	3.0 (76)	3.8 (1.7)
	1	2768A6900	8.5	5.8 (147)	4.1 (104)	3.9 (99)	6.8 (3.1)
D Remote	3/8	2768C3901	2.9	3.4 (86)	3.7 (94)	3.8 (51)	3.5 (1.6)
	1/2	2768C4901	3.2	3.4 (86)	3.7 (94)	3.8 (51)	3.5 (1.6)
	3/4	2768C5901	8.5*	4.4 (112)	4.1 (104)	3.0 (112)	5.2 (2.3)
	1	2768A6901	8.5*	5.8 (147)	4.1 (104)	6.0 (153)	8.8 (4.0)
D Manual	3/8	2768C3904	2.9	3.4 (86)	3.4 (86)	4.2 (107)	3.2 (1.4)
	1/2	2768C4904	3.2	3.4 (86)	3.4 (86)	4.2 (107)	3.5 (1.6)
	3/4	2768C5904	8.5*	4.4 (112)	6.7 (170)	4.4 (112)	5.2 (2.3)
	1	2768A6904	8.5*	5.8 (147)	6.7 (170)	6.0 (152)	8.8 (4.0)

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

**** Sensing Port**
The type A, C & D PO Checks have additional ports provided for the installation of a pressure sensing device such as a pop-up indicator or pressure switch as shown on page 55. Standards suggest that machine design should include a method for verifying the release of stored energy.



E

Valve Type	Port Size	Avg. C_V	DIN Connector	3-Pin Mini Connector	24VDC 3-Pin Mini Connector	24VDC 4-Pin Micro Connector	Dimensions inches (mm) A	B	C	Weight lb. (kg)
E	3/8	2.9	2778C3900	2778C3901	2778C3902	2778C3904	3.4 (86)	5.6 (142)	3.8 (97)	4.0 (1.8)
	1/2	3.2	2778C4900	2778C4901	2778C4902	2778C4904	3.4 (86)	5.6 (142)	3.8 (97)	4.2 (1.9)
	3/4	8.5*	2778C5900	2778C5901	2778C5902	2778C5904	4.4 (112)	6.7 (170)	4.4 (112)	6.1 (2.8)
	1	8.5*	2778A6900	2778A6901	2778A6902	2778A6904	5.8 (147)	6.7 (170)	6.0 (152)	6.1 (2.8)

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

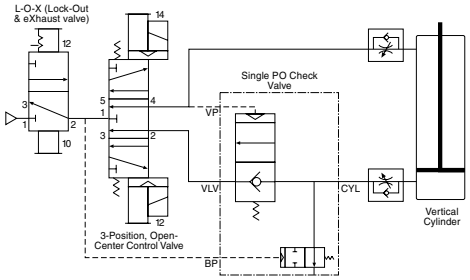
For further installation and application information, consult ROSS Bulletin 430.

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: Internal Pilot Models: 15 to 150 psig (1 to 10 bar); Solenoid Pilot Models: 30 to 150 psig (2 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 page 82.

Check Valves

Single Pilot-Operated Check Valves with Trapped Pressure Relief



Port Size	Model Number	Average C_V	Weight Lb (kg)
3/8 NPT	2751A3922	2.6	1.8 (0.8)
G 3/8	D2751A3922	2.6	1.8 (0.8)
1/2 NPT	2751A4922	2.8	1.8 (0.8)
G 1/2	D2751A4922	2.8	1.8 (0.8)
3/4 NPT	2751A5917	9.2	2.9 (1.3)

Pilot operated check valves with trapped pressure relief can be used to control vertically mounted pneumatic cylinders in the following ways.

- Maintaining a vertical cylinder in a stationary position. Even upon loss of electrical power.
- Jogging a vertical cylinder.
- Relieving pressure trapped between check valve and cylinder.

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 66. Standards suggest that machine design should include a method for verifying the release of stored energy.

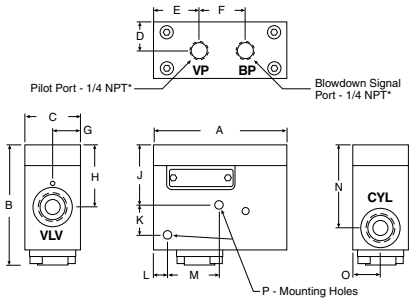
IMPORTANT NOTES and CAUTIONS:

- 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.

INSTALLATION:

- Locate the check valve as close to the cylinder as possible. This will minimize cylinder bounce and drift.
- Use non-expandable hose between check valve and cylinder. The expandability of thin-wall flexible hose can magnify cylinder bounce and drift.
- To install threaded pipe or fittings, engage threads one turn, apply thread sealant (tape not recommended) to threads, and tighten pipe or fitting fully.
- After system is pressurized, check all connections with soapy water to ensure that there are no leaks. Drifting can occur if leaks are present between the check valve and the cylinder.
- Pressure at port BP must be equal to or greater than the pressure in the cylinder and greater than the minimum operating pressure of the control valve.
- Do not restrict the exhaust of the control valve.

Dimensions – inches (mm)



Dimensions inches(mm)	Port Sizes* 3/8 & 1/2	Port Sizes* 3/4
A	3.9 (100)	4.3 (110)
B	3.5 (89)	4.2 (107)
C	1.7 (44)	2.2 (56)
D	0.8 (21)	1.1 (28)
E	1.3 (34)	1.6 (41)
F	1.4 (36)	1.7 (44)
G	0.8 (21)	1.1 (28)
H	1.8 (46)	2.1 (54)
J	1.7 (43)	1.6 (41)
K	0.9 (23)	1.5 (38)
L	0.4 (10)	0.4 (10)
M	1.5 (38)	2.1 (53)
N	2.4 (61)	2.8 (72)
O	0.8 (21)	1.1 (28)
P	0.27 (6.9)	0.34 (8.7)

* All ports have G (metric) threads on model numbers with D prefix, e.g. D2751A3922.

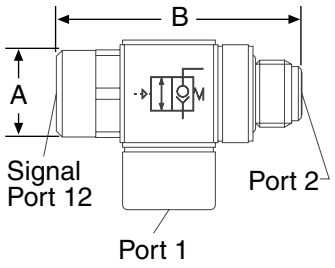
STANDARD SPECIFICATIONS: For valves on this page.
Ambient/Media Temperature: 40° to 175°F (4° to 80°C).
Flow Media: Filtered air.
Inlet Pressure: 15 to 150 psig (1 to 10 bar)
Pilot Pressure: Must be equal to or greater than inlet pressure.

IMPORTANT NOTE
Please read carefully and thoroughly all of the **CAUTIONS** on page 82.

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.

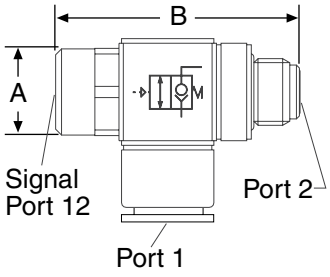


Threaded Banjo

Models with Threaded Banjo

Port Size		Valve Model Numbers	Average C_v		Dimensions inches (mm)		Tightening Torque Max. Ft-lb (Nm)
Port 1*	Port 2**		1 to 2	2 to 1	A	B	
G1/8	G1/8	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)
1/8	1/8	1958A1010	0.4	0.4	0.5 (13)	1.7 (41)	11.06 (15)
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)

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



Push-to-Connect Fitting

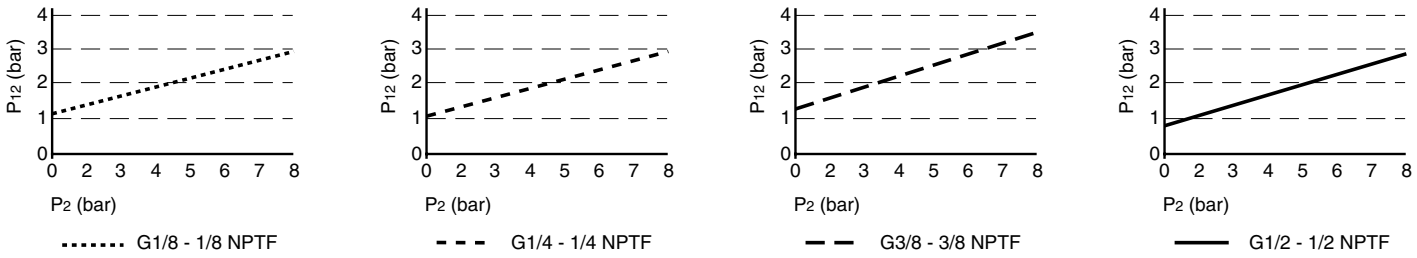
Pilot port (12) thread is M5 for models with G threads and 10-32UNF for models with NPTF threads. Manual override models available - consult ROSS.

Models with Push-to-Connect Fitting

Port Size		Valve Model Numbers	Average C_v		Dimensions inches (mm)		Tightening Torque Max. Ft-lb (Nm)
Port 1#	Port 2**		1 to 2	2 to 1	A	B	
4.0 6.0 8.0	G1/8	D1958A1140 D1958A1160 D1958A1180	0.4	0.4	0.5 (13)	1.7 (41)	7.38 (10)
6.0 8.0 10.0	G1/4	D1958A2160 D1958A2180 D1958A2110	0.8	0.7	0.7 (17)	1.9 (48)	8.85 (12)
8.0 10.0	G3/8	D1958A3180 D1958A3110	1.2	1.3	0.9 (22)	2.2 (55)	14.75 (20)
5/32” 1/4”	1/8	1958A1115 1958A1120	0.4	0.4	0.5 (13)	1.7 (41)	11.06 (15)
1/4” 3/8”	1/4	1958A2120 1958A2130	0.8	0.7	0.7 (17)	1.9 (48)	14.75 (20)
3/8”	3/8	1958A3130	1.2	1.3	0.9 (22)	2.2 (55)	22.13 (30)

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

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



STANDARD SPECIFICATIONS:
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 page 82.

ROSS Series MD4™

Modern, modular design with ROSS' traditional robust construction including a 1 year warranty designed to meet or exceed ISO Standard.

45° Mounting Increments (regulator & extra ports) Modular or In-line Mounting

Easy to use Mounting Brackets Integral to Modular Clamps

Tamper resistant removable knob for sight-feed lubricator

Cap color options: Gold (standard) Red Blue Yellow Gray

General purpose filtration plastic bowl with metal shatterguard

Extra ports & L-O-X® valve Options Gauge Standard

Metal Bowls (optional)

Removable Regulator Adjustment Key

Reverse Flow Regulator (optional)

5um standard (40 µm optional). Coalescing and Adsorbing Filter Options.

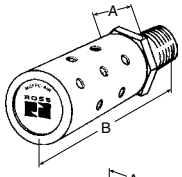
3/8" FRL Flows to 110 SCFM
1/2" FRL Flows to 150 SCFM
3/4" FRL Flows to 205 SCFM

O-ring seals provide no leak interface with front loaded, retained screws for easy access.

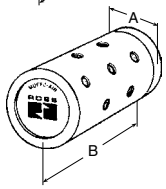
For more information on ROSS FRL's, please visit the ROSS web site to view the complete ROSS FRL catalog (ROSS Form #A10120) at www.rosscontrols.com/rosslit.htm.

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.



Male Pipe Threads
For ports 1/8 through 1-1/4



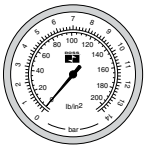
Female Pipe Threads
For ports 1-1/4 through 2-1/2

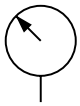
Port Size	NPT Threads	Model Numbers	C_v	Dimensions Average inches (mm) A	B	Weight lb. (kg)
1/8		5500A1003	2.0			
1/4	Male	5500A2003	2.0	0.8 (21)	2.2 (56)	0.3 (0.1)
3/8		5500A3013	2.0			
3/8		5500A3003	5.7			
1/2	Male	5500A4003	7.0	1.3 (32)	3.8 (96)	0.5 (0.2)
3/4		5500A5013	7.0			
3/4		5500A5003	15			
1	Male	5500A6003	18	2.0 (51)	5.6 (142)	1.5 (0.7)
1-1/4		5500A7013	18			
1-1/4	Female	5500A7001	37	2.5 (64)	5.9 (149)	2.3 (1.0)
1-1/2		5500A8001	38			
2	Female	5500B9001	50	3.0 (77)	7.3 (185)	3.5 (1.6)
2-1/2	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)
	5400A2011	0-200 (0-14)	2.2 (56)
	5400A2012	0-300 (0-21)	2.2 (56)

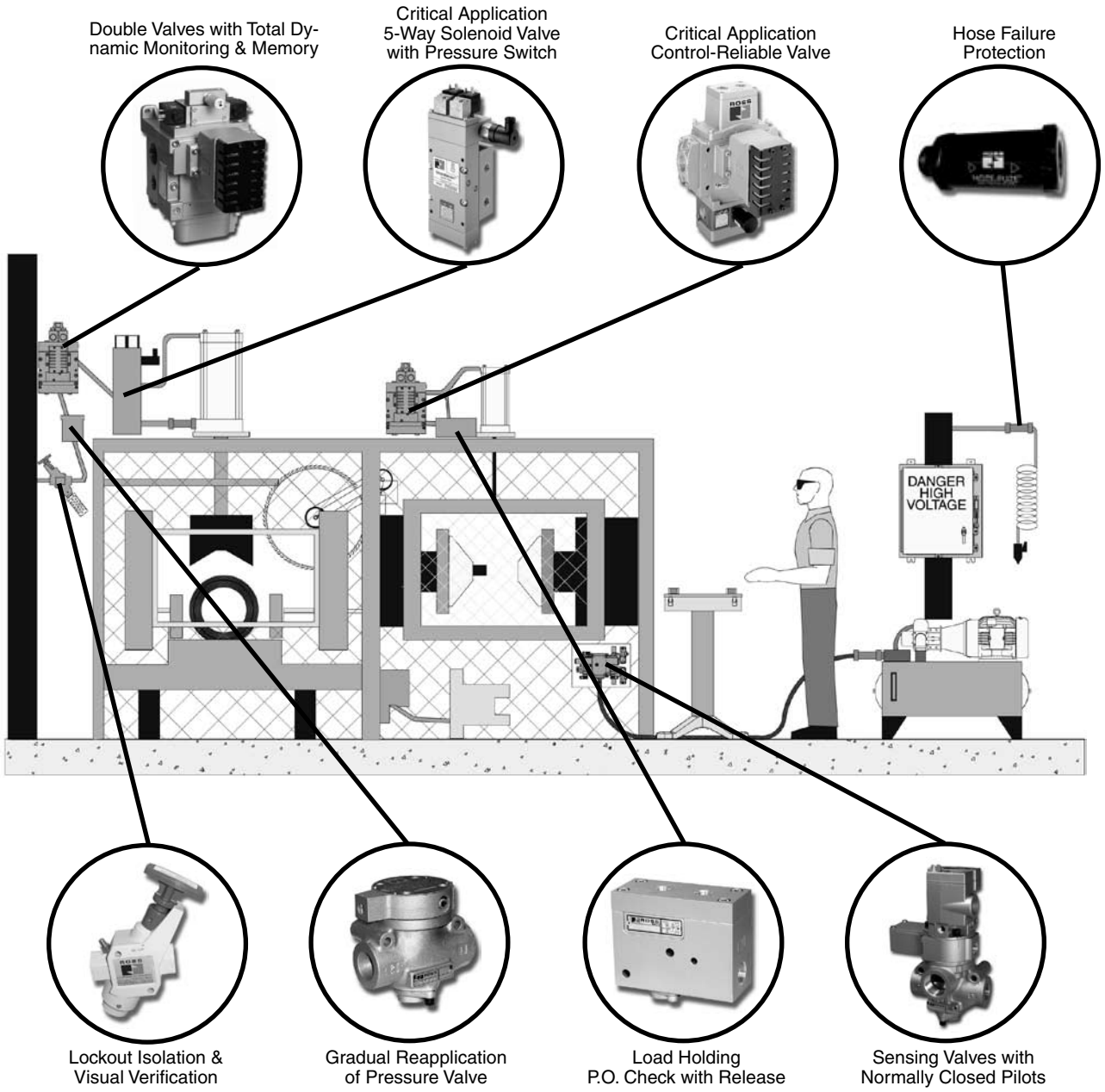
ROSS Safety-Related History

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.

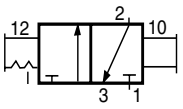
ROSS Safety-Related Solutions

- Control-reliable solenoid operated pneumatic valves.
- L-O-X® Lock-Out 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.

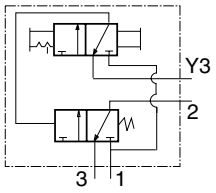


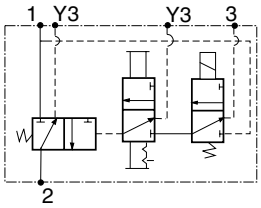
L-O-X® (Lock Out & eXhaust) Valves

ROSS L-O-X® valves are energy isolation valves and are generally used as the first valve in a line supplying compressed air to equipment. Air can be shut off by pushing the 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.



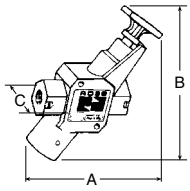
MANUAL



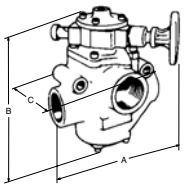


Piloted L-O-X® valves allow the flow of air to be controlled remotely as long as the L-O-X® control is open. See ROSS Bulletin 372D for more information about L-O-X® valves.

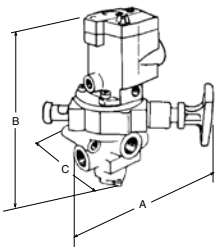
MANUAL



MANUAL PILOT



SOLENOID PILOT



Valve Type*	Port Size In-Out	Port Size Exh.	Valve Model Number*	Avg. C_v In-Out	Avg. C_v Out-Exh.	Dimensions inches (mm) A	B	C	Weight lb. (kg)
SOLENOID PILOT									
	3/8	3/4	1523C3002	6.0	8.0	6.3 (159)	8.8 (225)	2.0 (51)	1.5 (0.7)
	1/2	3/4	1523C4002	7.1	8.3	6.3 (159)	8.8 (225)	2.0 (51)	1.5 (0.7)
	3/4	3/4	1523C5012	8.6	9.5	6.3 (159)	8.8 (225)	2.0 (51)	1.5 (0.7)
	3/4	1-1/4	1523C5002	13	12	7.6 (194)	10.6 (270)	2.3 (57)	2.5 (1.1)
	1	1-1/4	1523C6002	13	14	7.6 (194)	10.6 (270)	2.3 (57)	2.5 (1.1)
	1-1/4	1-1/4	1523C7012	20	14	7.6 (194)	10.6 (270)	2.3 (57)	2.5 (1.1)
	1	1-1/2	2783A6006	23	34	7.4 (187)	8.6 (218)	6.4 (162)	7.0 (3.2)
	1-1/4	1-1/2	2783A7006	30	32	7.4 (187)	8.6 (218)	6.4 (162)	7.0 (3.2)
	1-1/2	1-1/2	2783A8016	30	31	7.4 (187)	8.6 (218)	6.4 (162)	7.0 (3.2)
	1-1/2	2-1/2	2783A8006	68	70	8.4 (213)	10.2 (259)	6.6 (162)	15.3 (6.9)
	2	2-1/2	2783A9006	70	70	8.4 (213)	10.2 (259)	6.6 (162)	15.3 (6.9)
	2-1/2	2-1/2	2783A9016	70	71	8.4 (213)	10.2 (259)	6.6 (162)	15.3 (6.9)
	1/4	1/2	2773A2072	2.5	3.1	7.1 (181)	8.4 (212)	6.5 (165)	3.5 (1.6)
	3/8	1/2	2773A3072	3.6	5.3	7.1 (181)	8.4 (212)	6.5 (165)	3.5 (1.6)
	1/2	1/2	2773A4082	3.3	5.3	7.1 (181)	8.4 (212)	6.5 (165)	3.5 (1.6)
	1/2	1	2773A4072	6.3	9.2	7.1 (181)	9.0 (228)	6.9 (175)	4.3 (1.9)
	3/4	1	2773A5072	7.7	11	7.1 (181)	9.0 (228)	6.9 (175)	4.3 (1.9)
	1	1	2773A6082	8.0	12	7.1 (181)	9.0 (228)	6.9 (175)	4.3 (1.9)
	1	1-1/2	2773A6072	23	34	8.1 (206)	11.8 (299)	6.9 (175)	8.0 (3.6)
	1-1/4	1-1/2	2773A7072	30	32	8.1 (206)	11.8 (299)	6.9 (175)	8.0 (3.6)
	1-1/2	1-1/2	2773A8082	30	31	8.1 (206)	11.8 (299)	6.9 (175)	8.0 (3.6)
	1-1/2	2-1/2	2773A8072	68	70	9.3 (235)	13.8 (352)	7.3 (184)	17.5 (7.9)
	2	2-1/2	2773A9072	70	70	9.3 (235)	13.8 (352)	7.3 (184)	17.5 (7.9)
	2-1/2	2-1/2	2773A9082	70	71	9.3 (235)	13.8 (352)	7.3 (184)	17.5 (7.9)

* ROSS' L-O-X® products come standard with a gold body and red handle. They can also be ordered with a yellow body. For NPT thread models with yellow bodies, prefix the number with a "Y" (Y1523C3002). For G thread models with yellow bodies, substitute the center letter with an "X" (D1523X3002).

L-O-X® Sensing Port

L-O-X® Sensing Port - Series 15 L-O-X® and L-O-X®/EEZ-ON® 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 lock-out.

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:

Ambient Temperature: *Solenoid Valves:* 40° to 120°F (4° to 50°C).
Manual Valves: 40° to 175°F (4° to 80°C).

Power Consumption: 87 VA holding on 50 or 60 Hz; 14 watts on DC.

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

Flow Media: Filtered air. 5 micron recommended.

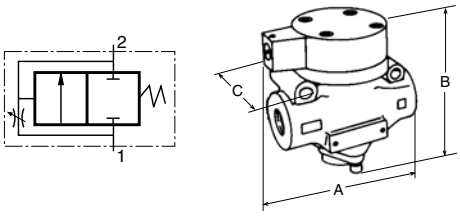
Inlet Pressure: *Port sizes 3/8 to 1-1/2:* 15 to 150 psig (1 to 10 bar) and 15 to 300 psig on Manual L-O-X® (1 to 20 bar). *Port sizes 1-1/2 to 2-1/2:* 30 to 150 psig (2 to 10 bar).

Threads: NPT standard. Prefix the model number with the letter "D" for parallel G threads, e.g. D1523C3002.

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

EEZ-ON® Valves

2/2 EEZ-ON® Valves



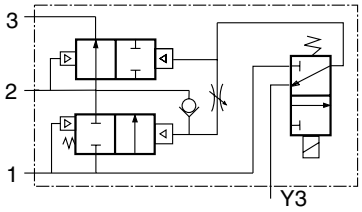
Port Size	Valve Model Numbers	Average C_v	Dimensions inches (mm) A	B	C	Weight lb. (kg)
1/4	2781A2007	2.3	3.8 (97)	3.8 (97)	3.0 (77)	1.5 (0.7)
3/8	2781A3007	3.8	3.8 (97)	3.8 (97)	3.0 (77)	1.5 (0.7)
1/2	2781A4017	4.0	3.8 (97)	3.8 (97)	3.0 (77)	1.5 (0.7)
1/2	2781A4007	7.7	4.6 (117)	4.5 (114)	3.0 (77)	2.3 (1.0)
3/4	2781A5007	9.0	4.6 (117)	4.5 (114)	3.0 (77)	2.3 (1.0)
1	2781A6017	9.0	4.6 (117)	4.5 (114)	3.0 (77)	2.3 (1.0)
1	2781A6007	24	6.6 (168)	7.6 (192)	4.1 (103)	6.0 (2.7)
1-1/4	2781A7007	29	6.6 (168)	7.6 (192)	4.1 (103)	6.0 (2.7)
1-1/2	2781A8017	29	6.6 (168)	7.6 (192)	4.1 (103)	6.0 (2.7)

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.

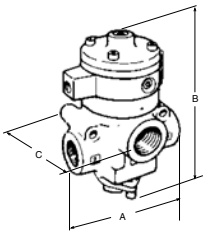
3/2 EEZ-ON® Valves

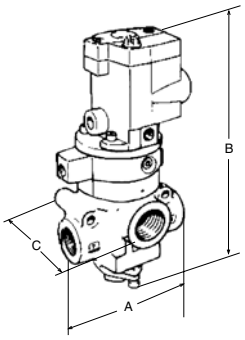
The 3/2 EEZ-ON® valve provides the same gradual pressure buildup as the 2/2 EEZ-ON® valves described above. In addition, the 3/2 valve has an exhaust port so that downstream air is exhausted when the valve is de-energized. At the same time, supply air is positively cut off so that a separate cutoff valve 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. See ROSS Bulletin 372D for more information.



Solenoid Pilot Models





Port Size In-Out	Port Size Exhaust	Valve Model Numbers Solenoid Pilot	Valve Model Numbers Remote Air Pilot	Average C_v 1 to 2	Average C_v 2 to 3	Dimensions inches (mm) A	B	C	D	Weight lb. (kg)
1/4	1/2	2773B2037	2783B2037	2.5	3.1	4.1 (104)	8.8 (224)	3.1 (79)	5.7 (146)	4.5 (2.0)
3/8	1/2	2773B3037	2783B3037	3.6	5.3	4.1 (104)	8.8 (224)	3.1 (79)	5.7 (146)	4.5 (2.0)
1/2	1/2	2773B4047	2783B4047	3.3	5.3	4.1 (104)	8.8 (224)	3.1 (79)	5.7 (146)	4.5 (2.0)
1/2	1	2773B4037	2783B4037	6.3	9.2	4.9 (124)	9.6 (243)	3.6 (92)	7.1 (180)	5.0 (2.3)
3/4	1	2773B5037	2783B5037	7.7	11	4.9 (124)	9.6 (243)	3.6 (92)	7.1 (180)	5.0 (2.3)
1	1	2773B6047	2783B6047	8.0	12	4.9 (124)	9.6 (243)	3.6 (92)	7.1 (180)	5.0 (2.3)

STANDARD SPECIFICATIONS:
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).

IMPORTANT NOTE
Please read carefully and thoroughly all of the **CAUTIONS** on page 82.

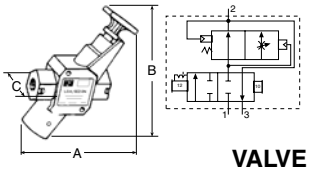
Combination L-O-X®/EEZ-ON® Valves

Combines L-O-X® Shut-off with EEZ-ON® Gradual Starts

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

The ROSS L-O-X®/EEZ-ON® valve is the newest addition to ROSS' renowned family of safety-related products. Combining two functions critical to safety concerns in any application, the ROSS L-O-X®/EEZ-ON® valve provides the shutdown and the gradual start-up (or, "soft start") capabilities today's systems require. In addition, because the L-O-X®/EEZ-ON® valve is two units in one, the need for multiple components is eliminated. And that means easier installation and less cost.

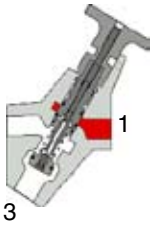
The new valve permits the gradual increase of downstream pressure in the pneumatic circuit that has just been actuated. The same unit also features a shut-off and lockout of system air to limit inadvertent actuation. For years, ROSS products have been the industry benchmark in safety-related pneumatic controls, and the tradition continues with the new L-O-X®/EEZ-ON® 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®/EEZ-ON® valve.



VALVE OPERATION

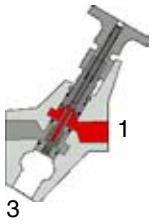
VALVE CLOSED

With a short push of the 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®/EEZ-ON® 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 handle pulled out, the adjustable needle valve (accessed through top of handle) setting determines the rate of pressure buildup.



VALVE OPEN

After the 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. See "Toggle Open Pressure" under standard specifications.

VALVE MODEL NUMBERS & OVERALL DIMENSIONS

Port Size In-Out	Port Size Exhaust	Valve Model Numbers*	Average C_v 1 to 2	Average C_v 2 to 3	Dimensions inches (mm) A	B	C	EEZ-ON® Valve C_v**	Weight lb. (kg)
3/8	3/4	1523B3102	6.0	8.0	6.4 (163)	8.8 (224)	2.0 (51)	0.6	1.5 (.7)
1/2	3/4	1523B4102	7.1	8.3	6.4 (163)	8.8 (224)	2.0 (51)	0.6	1.5 (.7)
3/4	3/4	1523B5112	8.0	9.5	6.4 (163)	8.8 (224)	2.0 (51)	0.6	1.5 (.7)
3/4	1-1/4	1523B5102	12.0	10.9	7.7 (196)	10.8 (274)	2.3 (58)	3.0	3.3 (1.5)
1	1-1/4	1523B6102	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	1523B7112	16.2	12.8	7.7 (196)	10.8 (274)	2.3 (58)	3.0	3.2 (1.5)

*ROSS L-O-X®/EEZ-ON® products come standard with gold body and blue handle. These products can also be ordered with yellow-colored body. For NPT thread models with yellow bodies, prefix the number with a "Y" (Y1523C3102). For G thread models with yellow bodies, substitute the center letter with an "X" (D1523X3102). **C_v 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 L-O-X® and L-O-X®/EEZ-ON® 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 lock-out.

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.

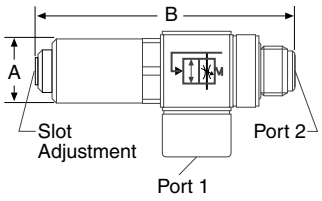
STANDARD SPECIFICATIONS:

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). Toggle Open Pressure = Inlet - 25 psig. If different toggle pressure is needed, contact ROSS Technical Services.
Port Threads: NPT standard. Prefix the model number with the letter "D" for parallel G threads, e.g. D1523A3102.
NOTE: Per specifications and regulations, these products are defined as energy isolation devices, NOT AS EMERGENCY STOP DEVICES.

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.

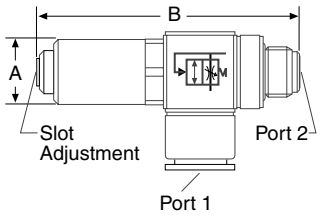


Threaded Banjo

Models with Threaded Banjo

Port Size		Valve Model Numbers		Average C_v	Dimensions inches (mm)		Tightening Torque Max. Ft-lb (Nm)
		Primary Pressure					
Port 1*	Port 2**	At Port 1	At Port 2		A	B	
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)
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)	2.8 (69)	22.13 (30)
1/2	1/2	1969A4010	1969A4011	2.2	1.1 (27)	2.9 (74)	29.50 (40)

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



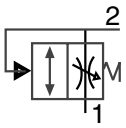
Push-to-Connect Fitting

Models with Push-to-Connect Fitting

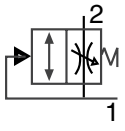
Port Size		Valve Model Numbers		Average C_v	Dimensions inches (mm)		Tightening Torque Max. Ft-lb (Nm)
		Primary Pressure					
Port 1**	Port 2#	At Port 1	At Port 2		A	B	
4.0	G1/8	D1969A1020	D1969A1021	0.5	0.5 (13)	2.3 (57)	7.38 (10)
6.0		D1969A1030	D1969A1031				
8.0		D1969A1040	D1969A1041				
6.0	G1/4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

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

Primary Pressure at port 1



Primary Pressure at port 2



STANDARD SPECIFICATIONS:
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 page 82.

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 BSPP Male-Female	1969A2001 D1969A2001
3/8	NPT Male-Female BSPP Male-Female	1969A3001 D1969A3001
1/2	NPT Male-Female BSPP Male-Female	1969A4001 D1969A4001
3/4	NPT Female BSPP Female	1969A5002 D1969A5002
1	NPT Female BSPP Female	1969A6002 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:
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 page 82.

DM²™ Crossflow™ SERPAR® Double Valves

The **ROSS** *DM*²™ **Crossflow**™ **SERPAR**® 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** *DM*²™ 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** *DM*²™ 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.

*DM*²™ 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.

***DM*²™ Monitoring**: The *DM*²™ is a patented 3/2 normally closed valve (with an intermediate, lock-out 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 *DM*²™ 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: *DM*²™ 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, 1-1/2, and 2 respectively.

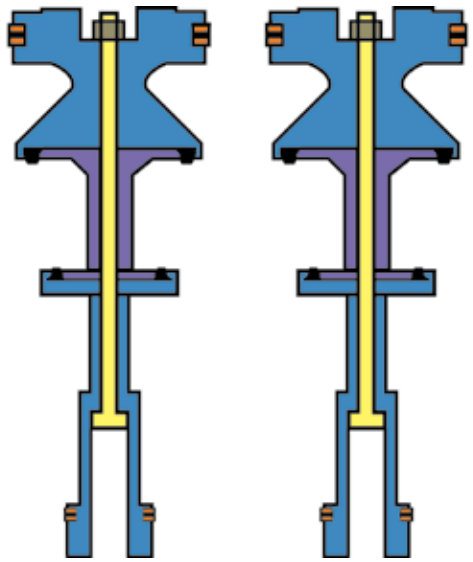
Valve Sizes: The *DM*²™ valves are available in 4 sizes, providing a broad range of flow capabilities to meet your needs. For convenience, valves are designated by the nominal sizes 4, 8, 12, and 30 with outlet ports up to 3/4, 1, 1-1/2, and 2 respectively.

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™.

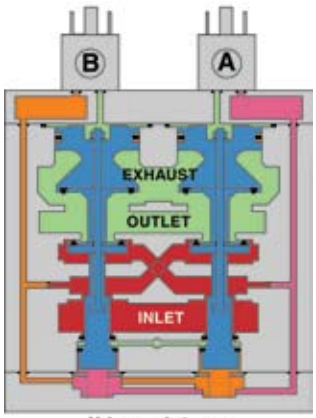
Monitoring devices have also been offered in a variety of designs to satisfy differing requirements. Traditionally, in order to achieve complete monitoring capability, it has been necessary to add devices or components to the valve or to the control system. The new *DM*²™ valve combines the monitor and 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.

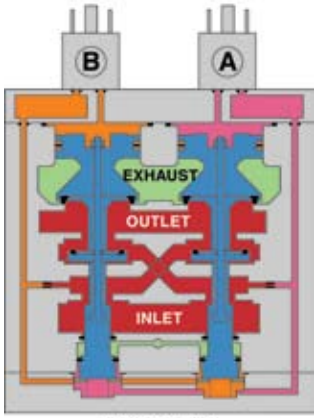


Overview of DM²™ Double Valve Function

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.)



Valve ready to run

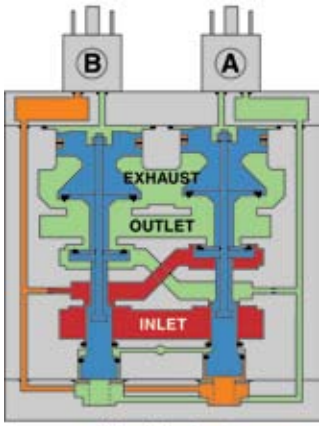


Valve actuated

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.

Whenever the valve elements operate in a sufficiently asynchronous manner, either on actuation or de-actuation, the valve will move to a locked-out position. In the locked-out position, one crossover and its related timing chamber will be exhausted, and the other crossover and its related timing chamber will be fully pressurized. The valve element (side B) that is partially actuated has pilot air available to fully actuate it, but no air pressure on the return piston to fully de-actuate the valve element. Air pressure in the crossover acts on the differential of side B stem diameters creating a latching force.

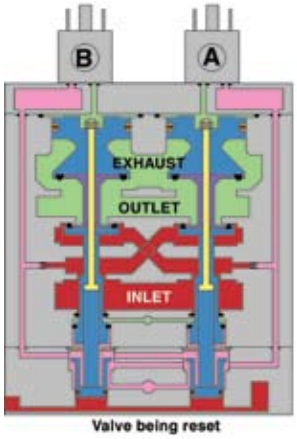


Valve locked out

Side A is in a fully closed position, and has no pilot air available to actuate, but has full pressure on the inlet poppet and return piston to hold the element in the fully closed position. Inlet air flow on side A into its crossover is restricted, and flows through the open inlet poppet on side B, through the outlet into the 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.

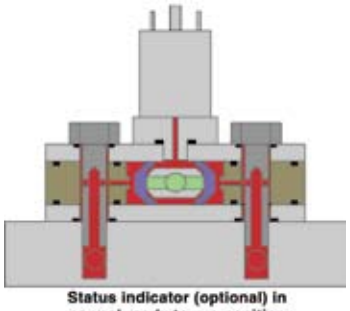
The valve will remain in the locked-out position, even if the inlet air supply is removed and re-applied. A remote reset signal must be applied to reset the valve.



Valve being reset

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.)

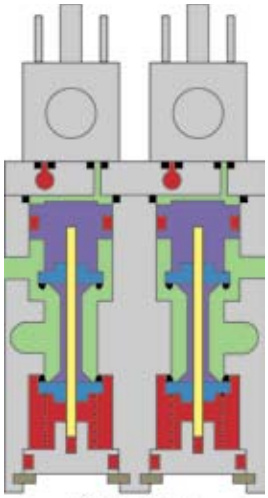
De-actuation of reset pistons causes the reset poppets to close and pilot supply to fully pressurize.


Status indicator (optional) in normal ready to run position

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.

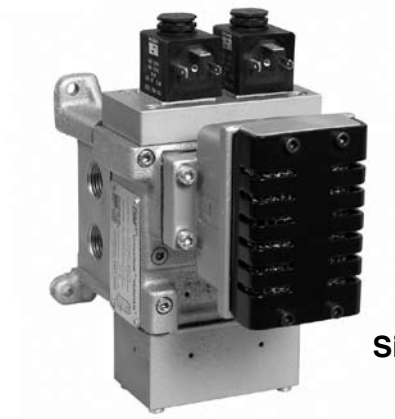
The status indicator pressure switch will actuate when the main valve is operating normally, and will de-actuate when the main valve is in the locked-out position or inlet pressure is removed. This device is not part of the valve lock-out function, but, rather, only reports the status of the main valve.

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

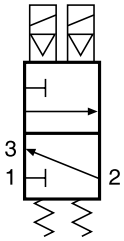
DM²™ Crossflow™ SERPAR® Double Valves

Size 4



Size 4

U.S. PATENT Nos. 6840258 and 6840259 – other worldwide patents pending.



Simplified Schematic

- **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 lock-out 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.

STANDARD SPECIFICATIONS:

Pilot solenoid: According to VDE 0580. Rated for continuous duty.
Standard voltages: 24 VDC, 110 VAC (50/60 Hz), 220** VAC (50/60 Hz). For other voltages consult ROSS. Specify voltage and frequency on order.
Power consumption for primary and reset solenoids (each solenoid): 5.8 W on DC; 15.8 VA inrush and 12.8 VA holding on AC.
Enclosure rating: IP65, IEC 60529.
Electrical connection: DIN 43650, Form A. 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: Compressed air, filtered (5µm recommended), lubricated or unlubricated (mineral oils according to DIN 51519/ISO-VG, viscosity classes 32-46).
Inlet Pressure: 30 to 120 psig (2 to 8 bar).
Monitoring: Dynamically, cyclically, internally during each actuating and de-actuating movement. Monitoring function has memory and requires an overt act to reset unit after lock-out.
Valve weight: Remote reset - 5.1 lbs (2.3 kg). Add 0.3 lbs (0.14 kg) for solenoid reset.
Mounting orientation: Preferably horizontally (valve on top of base) or vertically (with pilot solenoids on top).

HOW TO ORDER

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

DM2D D A 4 2 A 1 1

PRODUCT

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

REVISION LEVEL

BASIC SIZE
4.....4

BASE PORT SIZE
1/2 inlet – 1/2 outlet.....2
1/2 inlet – 3/4 outlet.....3
Valve only (less base).....X

STATUS INDICATOR
1.....YES
X.....NO

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

VOLTAGE
A.....24 VDC
B.....110 VAC
C**.....220 VAC

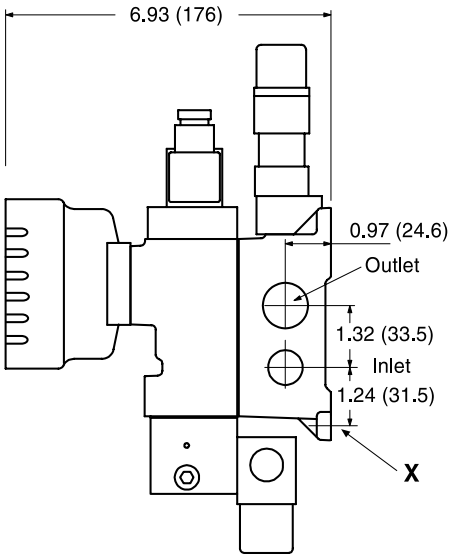
** 220 VAC not available in the U.S. (OSHA regulations limit press control voltage to no more than 120 VAC.)

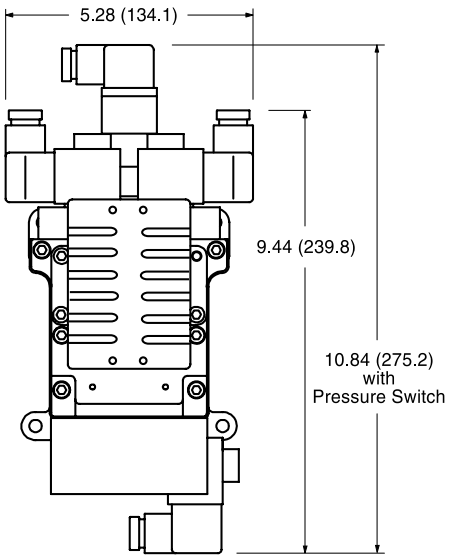
BASE MODEL NUMBERS and BASE SPECIFIC INFORMATION

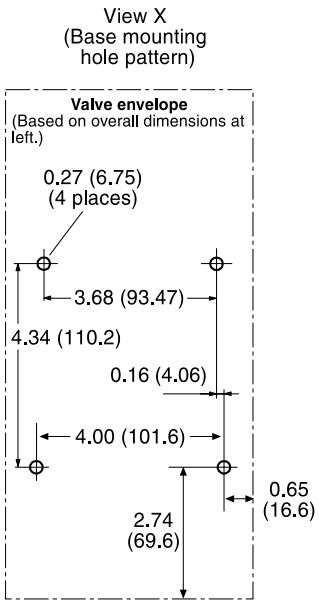
Model Number*	Inlet Port	Outlet Port	Status Indicator	Weight lbs (kg)
1697C91	1/2	1/2	No	1.7 (0.8)
1698C91	1/2	1/2	Yes	2.3 (1.1)
1699C91	1/2	3/4	No	1.7 (0.8)
1700C91	1/2	3/4	Yes	2.3 (1.1)

*NPT port threads. For BSPP threads add a “D“ prefix to the model number. For example, D1700C91.

DIMENSIONS – inches (mm)





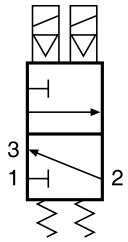


DM²™ Crossflow™ SERPAR® Double Valves

Size 8

Size 8

U.S. PATENT Nos. 6840258 and 6840259 – other worldwide patents pending.



Simplified Schematic

- **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 lock-out 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.

STANDARD SPECIFICATIONS:

Pilot solenoid: According to VDE 0580. Rated for continuous duty.
Standard voltages: 24 VDC, 110 VAC (50/60 Hz), 220** VAC (50/60 Hz). For other voltages consult ROSS. Specify voltage and frequency on order.
Power Consumption (each solenoid):
Primary solenoids: 15 W on DC; 36 VA inrush and 23 VA holding on AC.
Reset solenoid: 5.8 W on DC; 15.8 VA inrush and 12.8 VA holding on AC.
Enclosure rating: IP65, IEC 60529.
Electrical connection: DIN 43650, Form A. 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: Compressed air, filtered (5µm recommended), lubricated or unlubricated (mineral oils according to DIN 51519/ISO-VG, viscosity classes 32-46).
Inlet Pressure: 30 to 120 psig (2 to 8 bar).
Monitoring: Dynamically, cyclically, internally during each actuating and de-actuating movement. Monitoring function has memory and requires an overt act to reset unit after lock-out.
Valve weight: Remote reset - 8.2 lbs (3.7 kg). Add 0.3 lbs (0.14 kg) for solenoid reset.
Mounting orientation: Preferably horizontally (valve on top of base) or vertically (with pilot solenoids on top).

HOW TO ORDER

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

DM2D D A 5 4 A 1 1

PRODUCT

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

REVISION LEVEL

BASIC SIZE
8.....5

BASE PORT SIZE
3/4 inlet – 3/4 outlet.....4
1 inlet – 1 outlet.....5
Valve only (less base).....X

STATUS INDICATOR
1.....YES
X.....NO

RESET OPERATION
1.....REMOTE
2.....SOLENOID

VOLTAGE
A.....24 VDC
B.....110 VAC
C**.....220 VAC

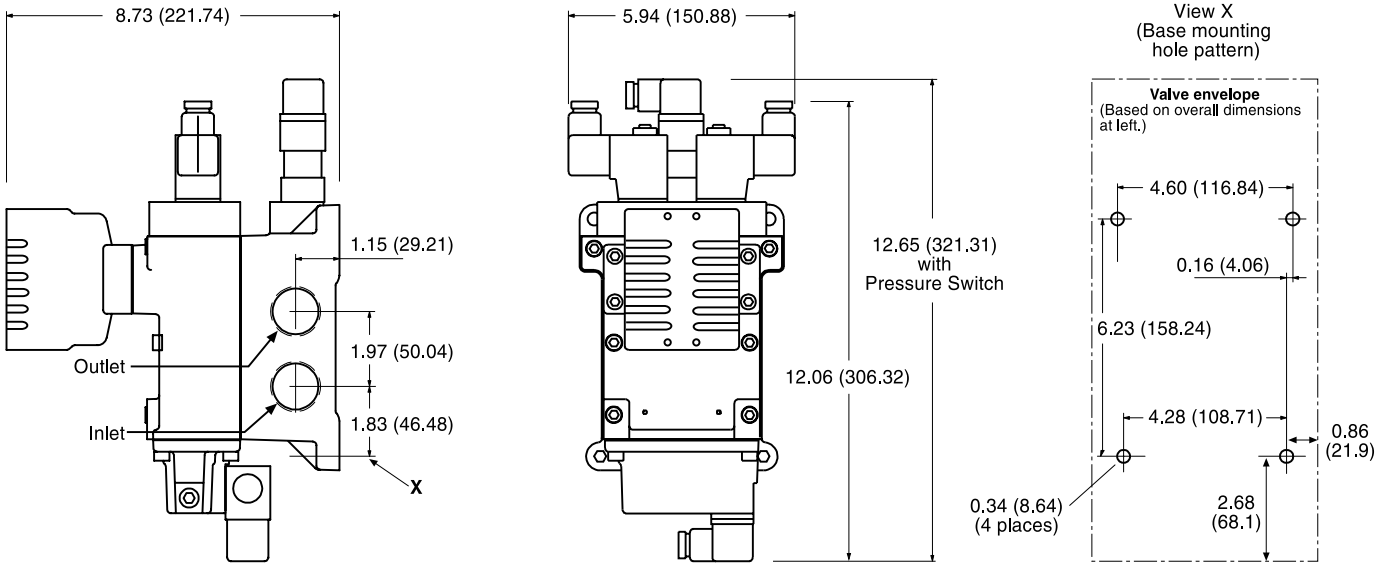
** 220 VAC not available in the U.S. (OSHA regulations limit press control voltage to no more than 120 VAC.)

BASE MODEL NUMBERS and BASE SPECIFIC INFORMATION

Model Number*	Inlet Port	Outlet Port	Status Indicator	Weight lbs (kg)
1701C91	3/4	3/4	No	3.6 (1.6)
1702C91	3/4	3/4	Yes	4.2 (1.9)
1703C91	1	1	No	3.6 (1.6)
1704C91	1	1	Yes	4.2 (1.9)

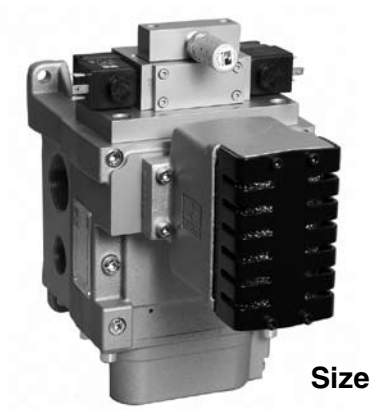
*NPT port threads. For BSPP threads add a “D“ prefix to the model number. For example, D1701C91.

DIMENSIONS – inches (mm)



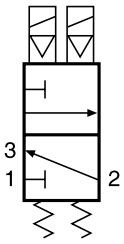
DM²™ Crossflow™ SERPAR® Double Valves

Size 12



Size 12

U.S. PATENT Nos. 6840258 and 6840259 – other worldwide patents pending.



Simplified Schematic

- **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 lock-out 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.
- **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:

Pilot solenoid: According to VDE 0580. Rated for continuous duty.
Standard voltages: 24 VDC, 110 VAC (50/60 Hz), 220** VAC (50/60 Hz). For other voltages consult ROSS. Specify voltage and frequency on order.
Power consumption for primary and reset solenoids (each solenoid): 5.8 W on DC; 15.8 VA inrush and 12.8 VA holding on AC.
Enclosure rating: IP65, IEC 60529.
Electrical connection: DIN 43650, Form A. 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: Compressed air, filtered (5µm recommended), lubricated or unlubricated (mineral oils according to DIN 51519/ISO-VG, viscosity classes 32-46).
Inlet Pressure: 30 to 120 psig (2 to 8 bar).
Monitoring: Dynamically, cyclically, internally during each actuating and de-actuating movement. Monitoring function has memory and requires an overt act to reset unit after lock-out.
Valve weight: Remote reset - 14.6 lbs (6.6 kg). Add 0.3 lbs (0.14 kg) for solenoid reset.
Mounting orientation: Preferably horizontally (valve on top of base) or vertically (with pilot solenoids on top).

HOW TO ORDER

(Choose your options (in red) to configure your valve model number. See pages 5, 7, & 11 for other basic sizes.)

DM2D D A 6 6 A 1 1

PRODUCT

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

REVISION LEVEL

BASIC SIZE
12.....6

BASE PORT SIZE
1inlet – 1outlet.....6
1inlet – 1-1/2 outlet.....7
Valve only (less base).....X

VOLTAGE
A.....24 VDC
B.....110 VAC
C**.....220 VAC

** 220 VAC not available in the U.S. (OSHA regulations limit press control voltage to no more than 120 VAC.)

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

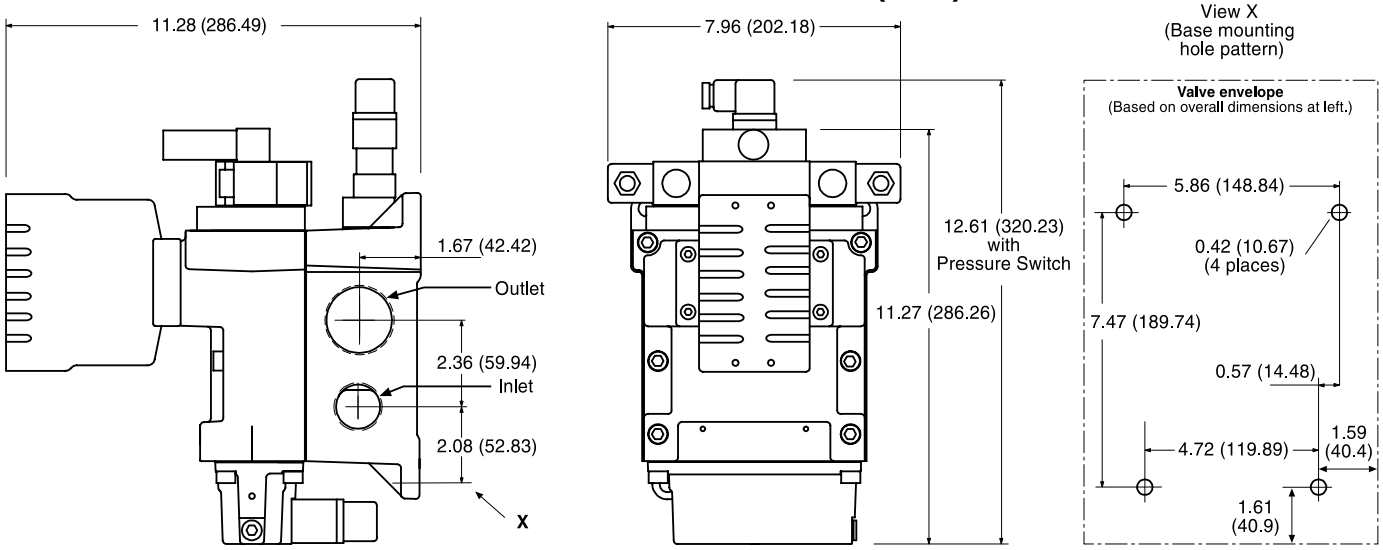
STATUS INDICATOR
1.....YES
X.....NO

BASE MODEL NUMBERS and BASE SPECIFIC INFORMATION

Model Number*	Inlet Port	Outlet Port	Status Indicator	Weight lbs (kg)
1705C91	1	1	No	6.2 (2.8)
1706C91	1	1	Yes	6.8 (3.1)
1707C91	1	1-1/2	No	6.2 (2.8)
1708C91	1	1-1/2	Yes	6.8 (3.1)

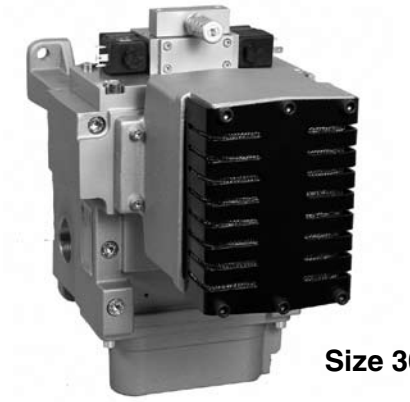
*NPT port threads. For BSPP threads add a “D“ prefix to the model number. For example, D1705C91.

DIMENSIONS – inches (mm)



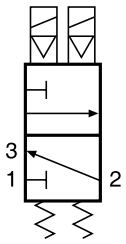
DM²™ Crossflow™ SERPAR® Double Valves

Size 30



Size 30

U.S. PATENT Nos. 6840258 and 6840259 – other worldwide patents pending.



Simplified Schematic

- **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 nomally open and normally closed contacts to provide status feedback to the press control system indicating whether the valve is in the lock-out 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.

- **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:

Pilot solenoid: According to VDE 0580. Rated for continuous duty.
Standard voltages: 24 VDC, 110 VAC (50/60 Hz), 220** VAC (50/60 Hz). For other voltages consult ROSS. Specify voltage and frequency on order.
Power consumption for primary and reset solenoids (each solenoid): 5.8 W on DC; 15.8 VA inrush and 12.8 VA holding on AC.
Enclosure rating: IP65, IEC 60529.
Electrical connection: DIN 43650, Form A. 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: Compressed air, filtered (5µm recommended), lubricated or unlubricated (mineral oils according to DIN 51519/ISO-VG, viscosity classes 32-46).
Inlet Pressure: 30 to 120 psig (2 to 8 bar).
Monitoring: Dynamically, cyclically, internally during each actuating and de-actuating movement. Monitoring function has memory and requires an overt act to reset unit after lock-out.
Valve weight: Remote reset - 31.7 lbs (14.4 kg). Add 0.3 lbs (0.14 kg) for solenoid reset.
Mounting orientation: Preferably horizontally (valve on top of base) or vertically (with pilot solenoids on top).

HOW TO ORDER

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

DM2D D A 8 8 A 1 1

PRODUCT

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

REVISION LEVEL

BASIC SIZE
30.....8

BASE PORT SIZE
1-1/2 inlet – 2 outlet.....8
Valve only (less base).....X

STATUS INDICATOR
1.....YES
X.....NO

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

VOLTAGE
A.....24 VDC
B.....110 VAC
C**.....220 VAC

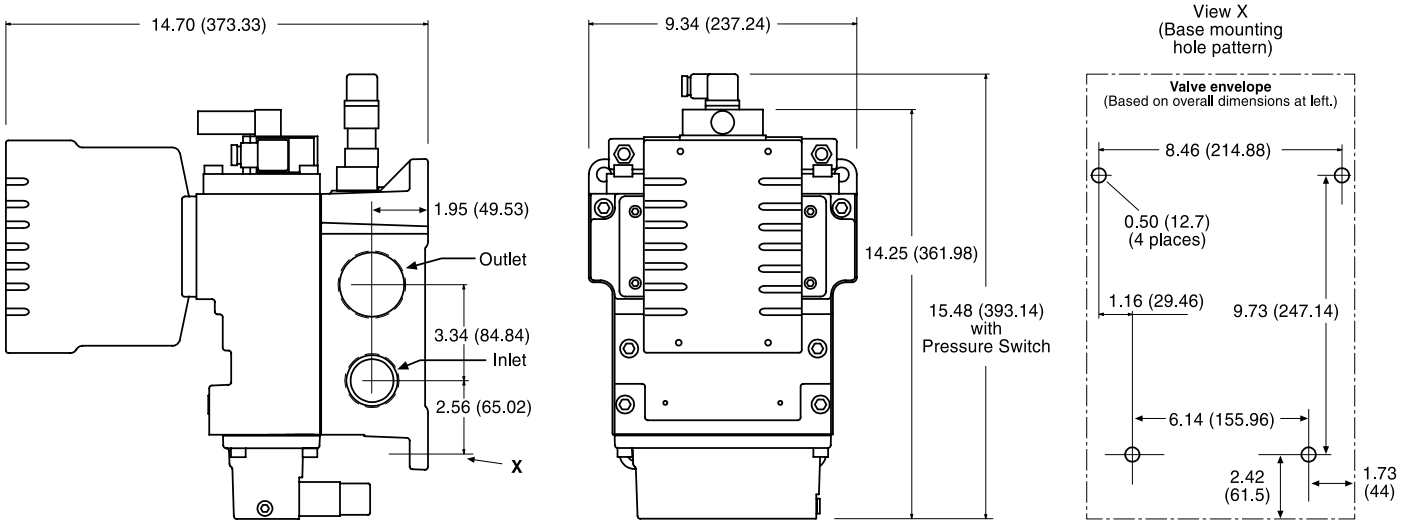
** 220 VAC not available in the U.S. (OSHA regulations limit press control voltage to no more than 120 VAC.)

BASE MODEL NUMBERS and BASE SPECIFIC INFORMATION

Model Number*	Inlet Port	Outlet Port	Status Indicator	Weight lbs (kg)
1709C91	1-1/2	2	No	12.0 (5.4)
1710C91	1-1/2	2	Yes	12.6 (5.7)

*NPT port threads. For BSPP threads add a “D“ prefix to the model number. For example, D1709C91.

DIMENSIONS – inches (mm)



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 lock-out 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)

For BSPP threads, add a D prefix to the model number. For example, 1223A1005 becomes D1223A1005. In the case of the W1413A1409, the prefix should be added to the base model instead of the valve.

Direct Solenoid Model for Line Mounting
1613B1020*

Pushbutton Models
Green button: 1223A1005

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 (6-1/2 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 Base Mounting
Valve: W1413A1409*
Sub-Base: 516B91

* Specify solenoid voltage and Hz when ordering.

Additional ROSS Double Valves

ROSS Double Valves, also known as "Control-Reliable valves", "Safety valves", "Press valves", "SERPAR® valves", "Crossflow® valves", and the "Critical Application Valve", are pneumatic control valves with two valve elements (redundant or dual channel), both of which must operate in order to supply pressure to the outlet port of the valve. The general function of these valves is that of a 3/2 normally closed valve (except for the 5/2 CROSSMIRROR®). The main difference between these widely known double valves and standard solenoid valves, however, is that any condition, which might cause one valve element to not shift along with the other, results in no output to the work device. The outlet port, in this situation, is connected to exhaust and the supply inlet is closed.

ROSS double valves come in many shapes and sizes from the tough little size 1 and 2 SERPAR® Crossflow valves with pressure switches (for external monitoring) to the size 30 workhorse version with internal monitoring (L-G, E-P, or DS monitors). And do not forget the sophisticated CROSSMIRROR® valves that are available in 3/2 monitored versions as well as 5/2 non-monitored models. Lastly, but not to be overlooked, is the *DM²*™ Crossflow™ SERPAR® 3/2 double valve with total dynamic monitoring and memory. These valves provide new features in response to the changing demands of the mechanical press industry and it associated standards and regulations regarding the control of pneumatically controlled clutch and brake applications.

The original application for these double valves was in the control of clutch/brakes on mechanical stamping presses, but they have found their way into many other critical applications such as alternative lock out systems for energy isolation and other Category-3 or –4 safety requirements. ROSS double valves are a vital part of any control-reliable fluid power control system.

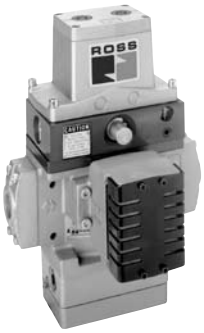
Control reliability does not end with the wires. The final element of control in any safety oriented fluid power system must be a control-reliable valve, otherwise, the integrity of the whole system is limited. So, check out the ROSS line of double valves and see what we can do to improve the integrity of your safety equipment.

Double Valves with Pressure Switches for External Monitoring feature:

- Covered by multiple global patents and patents pending (*DM²*™).
- Designed to enable users to comply with current safety regulations.
- Models with pressure switches can be integrated with external monitoring systems to provide for lock out and inhibit further machine operation until system is reset.
- Default to de-energized position upon fault condition.
- Built-in non-clogging silencers on Series 35.

DM²™ **Crossflow™ SERPAR® 3/2 double valves with total dynamic monitoring and memory.**

Series 35 - SERPAR® Crossflow™ (3/2), with pressure switches for external monitoring. Available in sizes 1 & 2.



Series 35 - SERPAR® Crossflow™ (3/2), internally monitored (L-G, E-P, or D-S). Available in sizes 4, 8, 12, & 30.

Series 77 - CROSSMIRROR® (5/2), optional pressure switch for external monitoring. Available in size 4.

Double Valves with Internal Monitoring & Lockout feature the following:

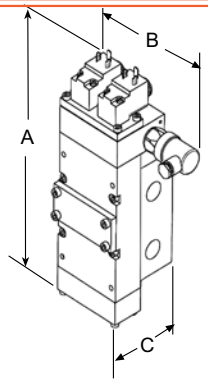
- Internal Monitoring, requiring no additional monitoring circuitry.
- Automatic lockout/inhibit upon detection of a malfunction.
- 100% dynamic monitoring on 3/2 CROSSMIRROR® models
- Default to de-energized position upon fault condition.
- Dedicated reset solenoid, which cannot be operated if main solenoids are energized.
- No undesired automatic reset upon removal of electrical or pneumatic energy sources.
- Built-in non-clogging silencers on Series 35.

Double Valves with Total Dynamic Monitoring and Memory feature the following:

- Basic 3/2 normally closed valve function.
- Status indicator (optional).
- Models include high flow, clog resistant silencers.
- Base mounted - with BSPP or NPT pipe threads
- Inet and outlet ports on both sides to provide for flexible piping.

Series 77 5/2 CROSSMIRROR® Double Valves

5/2 CROSSMIRROR® double valve with pressure switch



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

Valve Assembly* Size	Model Numbers	Base Numbers	Port Sizes 1	Port Sizes 2,3,4,5	C_v 1-2	C_v 1-4	C_v 2-3	C_v 4-5	Pressure Switch	Dimensions inches (mm) A	B	C	Weight lb. (kg.)
2	7776A3410	996C91	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)
2	7776A3411	996C91	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)

* Model number includes base. For G threads, order valve assembly with a "D" prefix. (Also use same prefix when ordering bases separately.) •Replacement valve numbers: 7776A3400 (no pressure switch) and 7776A3401 (with pressure switch).

4	7776A4420	1049C91	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)
4	7776A4421	1049C91	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)
4	7776A5410	1153C91	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)
4	7776A5411	1153C91	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)

* Model number includes base. For G threads, order valve assembly with a "D" prefix. (Also use same prefix when ordering bases separately.) Replacement valve numbers: 7776A4400 (no pressure switch) and 7776A4401 (with pressure switch).

4	S7776A4H10	1159G91	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)
4	S7776A4H11	1159G91	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)

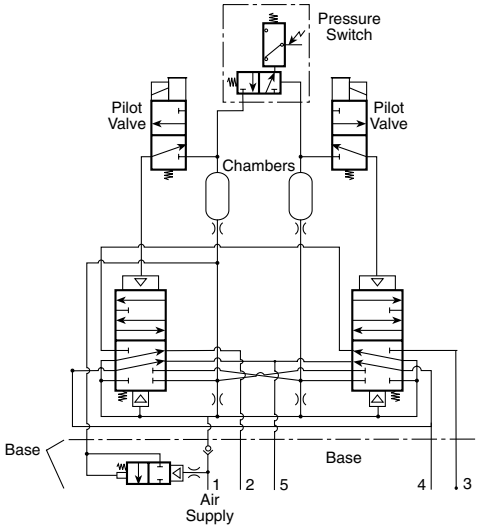
* Model number includes base. •Replacement valve numbers: 7776A4400 (no pressure switch) and 7776A4401 (with pressure switch).

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.



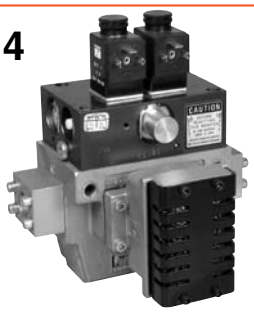
STANDARD SPECIFICATIONS:
Pilot Solenoids: Rated for continuous duty.
Standard Voltages: 100-110 volts 50 Hz; 100-120 volts 60 Hz; 24, 110 volts DC
Power Consumption: Each solenoid, 11 VA inrush, 8.5 VA holding on 50 or 60 Hz; 6 watts on DC
Electrical Connections: Uses cord-grip connectors at solenoids. Order connectors separately (see page 16).

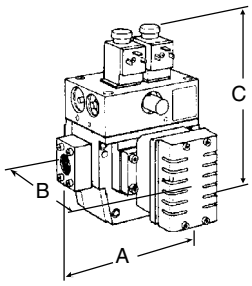
Ambient Temperature: 40° to 120° F (4° C to 50° C).
Flow Media: Filtered air. 5 micron recommended.
Inlet Pressure: 40 to 150 psig (2.5 to 10 bar).
Media Temperature: 40° to 175° F (4° to 80° C).

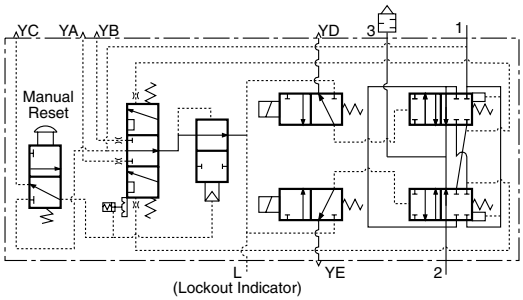
IMPORTANT NOTE
Please read carefully and thoroughly all of the **CAUTIONS** on page 82.

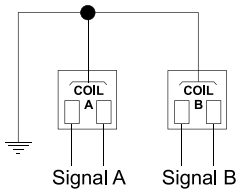
Series 35 SERPAR® Crossflow Double Valves– L-G Monitor

Size 4



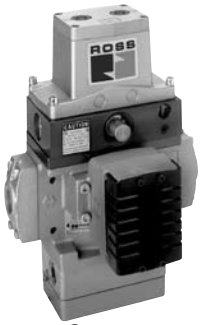


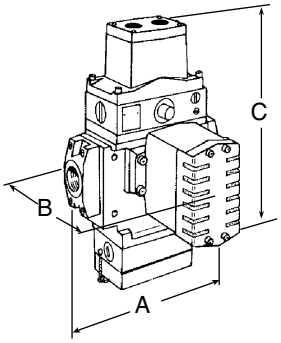


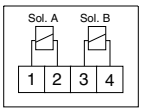


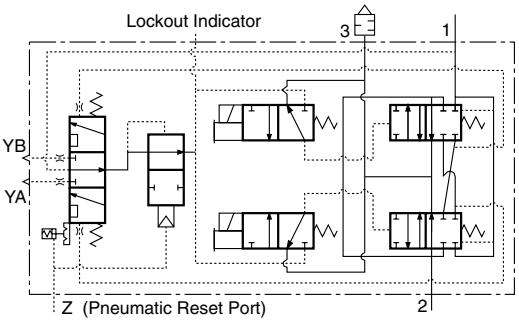
Port Size	Average C_v* In-Out	Out-Exh.	Monitor Size	Monitor Reset	Valve Model Numbers Right Inlet	Left Inlet	Dimensions inches (mm) A	B	C	Weight lb. (kg.)
3/8	3.0	6.0	4	Manual	3573D3191	3573D3195	7.4 (188)	6.3 (160)	7.4 (188)	8.3 (3.7)
	3.0	6.0	4	Remote	3573D3192	3573D3196	7.4 (188)	6.3 (160)	7.4 (188)	8.3 (3.7)
1/2	3.0	8.0	4	Manual	3573D4211	3573D4215	7.4 (188)	6.3 (160)	7.4 (188)	8.3 (3.7)
	3.0	8.0	4	Remote	3573D4212	3573D4216	7.4 (188)	6.3 (160)	7.4 (188)	8.3 (3.7)
3/4	3.0	9.0	4	Manual	3573D5211	3573D5215	7.4 (188)	6.3 (160)	7.4 (188)	8.3 (3.7)
	3.0	9.0	4	Remote	3573D5212	3573D5216	7.4 (188)	6.3 (160)	7.4 (188)	8.3 (3.7)

Sizes 8, 12, 30









Port Size	Average C_v In-Out	Out-Exh.	Valve Model Numbers Size	With Overrides	Without Overrides	Dimensions inches (mm) A	B	C	Weight lb. (kg.)
1/2	3.5	8.5	8	3573A4142	3573A4162	8.5 (216)	7.1 (180)	12.3 (312)	15.3 (6.9)
3/4	4.0	12	8	3573A5142	3573A5162	8.5 (216)	7.1 (180)	12.3 (312)	19.0 (8.6)
	8.0	15	12	3573A5152	3573A5172	9.0 (228)	8.5 (216)	13.4 (340)	19.0 (8.6)
1	4.0	12	8	3573A6152	3573A6172	8.5 (216)	7.1 (180)	12.3 (312)	15.3 (6.9)
	8.5	19	12	3573A6162	3573A6182	9.0 (228)	8.5 (216)	13.4 (340)	19.0 (8.6)
1-1/4	9.0	21	12	3573A7162	3573A7182	9.0 (228)	8.5 (216)	13.8 (351)	19.0 (8.6)
	20	42	30	3573A7152	3573A7172	12.4 (314)	11.1 (282)	17.7 (450)	37.5 (16.9)
1-1/2	21	43	30	3573A8162	3573A8182	12.4 (314)	11.1 (282)	17.7 (450)	37.5 (16.9)

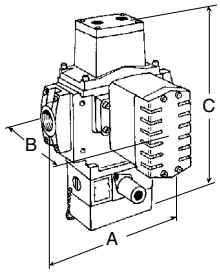
2 inch port size available on size 30 valves. Order part number 1999H77 flange kit separately.

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, 110 volts DC. Other voltages available.
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 Crossflow size 4 (see page 16); 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).

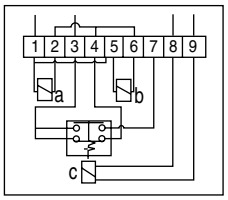
IMPORTANT NOTE
Please read carefully and thoroughly all of the **CAUTIONS** on page 82.

Series 35 SERPAR® Crossflow Double Valves– E-P Monitor

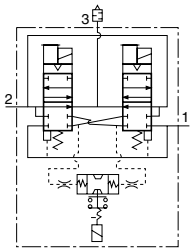
Sizes 8 to 30



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.



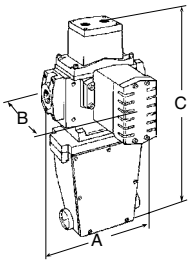
Wiring Diagram

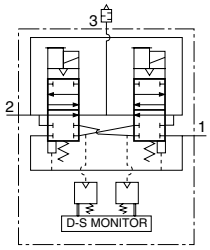


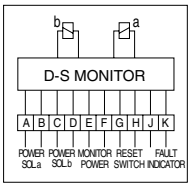
Port Size	Average C_v* In-Out	Out-Exh.	Size	Valve Model Numbers w/Overrides	w/o Overrides	Dimensions inches (mm) A	B	C	Weight lb. (kg.)
1/2	3.5	8.5	8	3573A4141	3573A4161	8.5 (216)	7.2 (184)	11.4 (288)	11.8 (5.3)
3/4	4.0	12	8	3573A5141	3573A5161	8.5 (216)	7.2 (184)	11.4 (288)	11.8 (5.3)
	8.0	15	12	3573A5151	3573A5171	8.6 (219)	8.6 (219)	12.0 (303)	15.5 (7.0)
1	4.0	12	8	3573A6151	3573A6171	8.5 (216)	7.2 (184)	11.4 (288)	11.8 (5.3)
	8.5	19	12	3573A6161	3573A6181	8.6 (219)	8.6 (219)	12.0 (303)	15.5 (7.0)
1-1/4	9.0	21	12	3573A7161	3573A7181	9.0 (228)	8.5 (216)	12.8 (324)	15.5 (7.0)
	20	42	30	3573A7151	3573A7171	12.4 (314)	11.1 (282)	17.3 (440)	35.0 (15.8)
1-1/2	21	43	30	3573A8161	3573A8181	12.4 (314)	11.1 (282)	17.3 (440)	35.0 (15.8)

Series 35 SERPAR® Crossflow Double Valves– D-S Monitor

Sizes 8 to 30







Wiring Diagram

Port Size	Average C_v* In-Out	Out-Exh.	Size	Valve Model Numbers w/Overrides	w/o Overrides	Dimensions inches (mm) A	B	C	Weight lb. (kg.)
1/2	3.5	8.5	8	3573B4143	3573B4163	8.5 (216)	7.2 (184)	16.5 (418)	16.8 (7.6)
3/4	4.0	12	8	3573B5143	3573B5163	8.5 (216)	7.2 (184)	16.5 (418)	16.8 (7.6)
	8.0	15	12	3573B5153	3573B5173	9.0 (229)	8.6 (219)	17.8 (451)	20.5 (9.2)
1	4.0	12	8	3573B6153	3573B6173	8.5 (216)	7.2 (184)	16.5 (418)	16.8 (7.6)
	8.5	19	12	3573B6163	3573B6183	9.0 (229)	8.6 (219)	17.8 (451)	20.5 (9.2)
1-1/4	9.0	21	12	3573B7163	3573B7183	9.0 (229)	8.6 (219)	17.8 (451)	20.5 (9.2)
	20	42	30	3573B7153	3573B7173	12.4 (314)	11.1 (282)	21.8 (553)	39.3 (17.7)
1-1/2	21	43	30	3573B8163	3573B8183	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 E-P monitor valves.
Pilot Solenoids: Two, rated for continuous duty. Standard voltages: 100-110 volts 50 Hz.; 100-120 volts 60 Hz.; 24, 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).

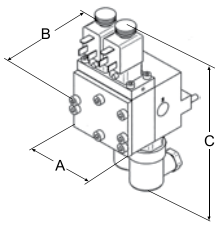
IMPORTANT NOTE
Please read carefully and thoroughly all of the **CAUTIONS** on page 82.

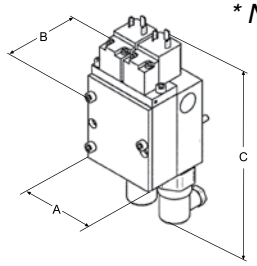
Series 35 SERPAR® Crossflow Double Valves

Size 1 & 2

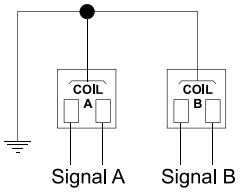
Crossflow Size 1

Crossflow Size 2





** Non-monitored*



Valve Size	Valve Assembly Model Number*	C_v Rating 1-2	C_v Rating 2-3	Pressure Switches**	Press. Switch Provision	Port Sizes 1 & 2	Port Sizes 3	Dimensions inches (mm) A	B	C	Average Response Constants M	F In-Out	F Out-Exh.	Weight lb. (kg.)
1	3573B2632	0.9	1.4	None	Yes	1/4	1/4	2.7 (69)	3.3 (84)	5.0 (127)	28	4.6	3.4	2.1 (95)
1	3573B2640	0.9	1.4	None	No	1/4	3/8	2.7 (69)	3.3 (84)	5.0 (127)	24	4.4	3.1	2.1 (95)
1	3573B2642	0.9	1.4	Two	Yes	1/4	1/4	2.7 (69)	3.3 (84)	7.5 (191)	28	4.6	3.4	2.5 (1.14)
1	3573B2644	1.2	1.7	Two	Yes	3/8	3/8	2.7 (69)	3.3 (84)	7.6 (195)	25	3.1	2.8	2.9 (1.32)
1	3573B2645	1.2	1.7	None	Yes	3/8	3/8	2.7 (69)	3.3 (84)	5.1 (130)	25	3.1	2.8	2.5 (1.14)
2	3573B4620	3.7	6.6	None	No	1/2	1/2	3.4 (86)	3.2 (81)	6.3 (160)	30	1.2	1.0	4.3 (1.95)
2	3573B4632	3.7	6.6	None	Yes	1/2	1/2	3.4 (86)	3.2 (81)	6.5 (165)	30	1.2	1.0	4.3 (1.95)
2	3573B4640	3.7	9.0	None	No	1/2	3/4	3.4 (86)	3.2 (81)	6.5 (165)	25	1.1	0.9	4.3 (1.95)
2	3573B4642	3.7	6.6	Two	Yes	1/2	1/2	3.4 (86)	3.2 (81)	9.0 (229)	30	1.2	1.0	4.8 (2.18)
2	3573B4643	4.2	9.0	None	No	3/4	3/4	3.4 (86)	3.2 (81)	6.5 (165)	25	1.1	0.9	4.7 (2.13)
2	3573B4644	4.2	9.0	Two	Yes	3/4	3/4	3.4 (86)	3.2 (81)	9.0 (165)	25	1.1	0.9	5.2 (2.36)
2	3573B4645	4.2	9.0	None	Yes	3/4	3/4	3.4 (86)	3.2 (81)	6.5 (165)	25	1.1	0.9	4.7 (2.13)
2	3573B4652	3.7	9.0	None	Yes	1/2	3/4	3.4 (86)	3.2 (81)	9.0 (165)	25	1.1	0.9	4.3 (1.95)

* Model number includes base. For G threads, order with a "D" prefix. For JIS threads, order with a "J" prefix. Valve and base can be ordered separately; consult ROSS.
** Only valves with pressure switches should be used to control clutch/brake mechanisms on press machinery. The pressure switches must be used in conjunction with a monitoring device to assist with OSHA compliance (Ref. 1910.217).

Valve Response Time

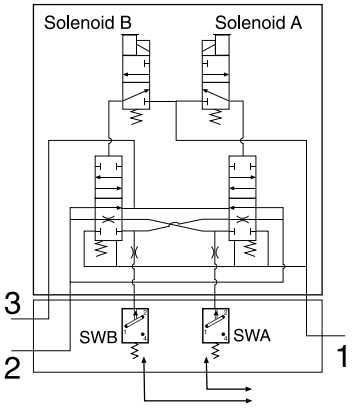
The constants below, designated M and F, can be used to determine the amount of time required to fill or exhaust a volume of any size using the following formula:

Vlv. Resp. Time (msec)= M + F *V

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

Pressure Switches & Monitoring:

Valves without pressure switches must not be used to control clutch/brake mechanisms on press machinery. Valves with pressure switches must be used in conjunction with an external monitoring device to assist with OSHA compliance (Ref. 1910.217). The valves on this page do not have a built-in monitor, and must only be used in conjunction with an external monitoring system. Such monitoring system must be capable of inhibiting the operation of the valve in the event of a failure within the valve.



To customer's external monitor

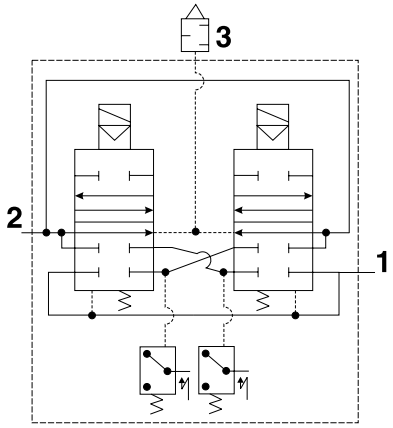
STANDARD SPECIFICATIONS:

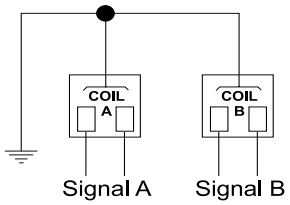
Pilot Solenoids: Two, rated for continuous duty.
Standard Voltages: 100-110 volts 50 Hz; 100-120 volts 60 Hz; 24, 110 volts DC Other voltages available.
Power Consumption: *Size 1:* Each solenoid, 12 VA maximum inrush, 9.8 VA maximum holding on 50 or 60 Hz; 7.5 watts nominal on DC *Size 2:* Each solenoid, 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 2 connectors, see page 16.*
Size 1 Connectors: (specify solenoid voltage for options with light). For use with dropcord (cord not included) 266K (w/o light) 267K77 (w/light)
Wired with 10-mm cord (cord exits upward) 372K77 (w/o light) 382K77 (w/light). Other options available; consult ROSS.
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 page 82.

SERPAR® 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.

Size	Port Size	Model Numbers Flanged Ports Inlet Right	Inlet Left	Standard Flow SCFM/Min (l/sec.)	Weight lb. (kg)
4	3/8	3573C3270	3573C3276	190 (90)	8.4 (3.8)
4	1/2	3573C4270	3573C4276	190 (90)	8.4 (3.8)
4	3/4	3573C5230	3573C5236	190 (90)	8.4 (3.8)

For G threads, order base with a “D” prefix.

STANDARD SPECIFICATIONS:

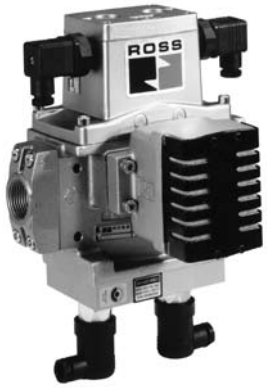
Pilot Solenoids: Two, rated for continuous duty.
Standard Voltages: 24, 48, 110, 220 volts; 50/60 Hz; 24, 110 volts DC Other voltages are available. *Voltages at pressure switches must not exceed 250 volts.*
Power Consumption: Each solenoid, 35 VA maximum in-rush, 22 VA holding on 50 or 60 Hz. 14 watts nominal on DC
Electrical Connection: Connectors according to DIN 43650 A (ISO 4400), must be ordered separately.
Electrical Connections: Uses cord-grip connectors at solenoids. Order connectors separately (see page 21).
Ambient Temperature: 40° to 120° F (4° C 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.

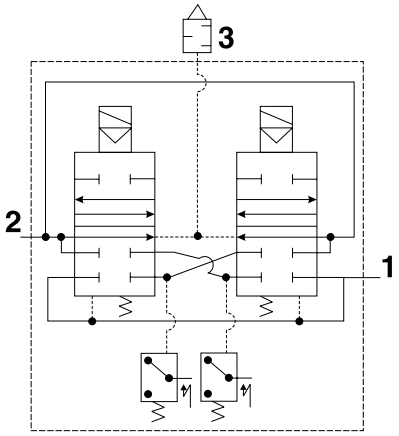
CAUTION: If the system must be reset, electrical signals to both solenoids must be removed to prevent the machine from immediately recycling and producing a potentially hazardous condition.

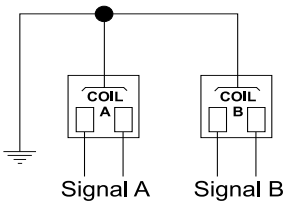
IMPORTANT NOTE
Please read carefully and thoroughly all of the **CAUTIONS** on page 82.

SERPAR® 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	Flanged Models	Standard Flow SCFM/Min. (l/sec.)	Weight Lbs. (kg.)
8	1/2	3573B4638	297 (140)	11.4 (5.2)
	3/4	3573B5638		
	1	3573B6638		
12	3/4	3573B5632	784 (370)	15.4 (7.0)
	1	3573B6632		
	1-1/4	3573B7632		
30	1-1/4	3573B7630	1,800 (850)	33.9 (15.4)
	1-1/2	3573B8630		

For G threads, order base with a "D" prefix.

STANDARD SPECIFICATIONS:

Pilot Solenoids: Two, rated for continuous duty.
Standard Voltages: 24, 48, 110, 220 volts; 50/60 Hz; 24, 110 volts DC Other voltages are available. *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 21).
Electrical Connection: Connectors according to DIN 43650 A (ISO 4400), must be ordered separately.
Ambient Temperature: 40° to 120° F (4° C 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 page 82.

MODEL NUMBER INDEX

If your part number is not listed, consult ROSS or your local ROSS distributor on the back of this catalog.

MODEL NUMBER INDEX (cont'd)

Additional ROSS Catalogs

Bulletin Number Form (If Applicable) Number	Description	ROSS
440	ROSS Valves for Vacuum Service	A10122
N/A	ENERGYSAVER™ Valve 5/2 Single & Double Solenoid Pilot Valve for ISO 55099/I	A10144
452	ROSS Series 28 5/3, 5/2 & 3/2 Inline & Manifold Mount Valves	A10167
453	RSP Rodless Cylinders	A10168
463	ROSS Controls Serial Bus	A10175
450	Modular Press Solutions	A10155
462	Modular Pneumatic Solutions	A10181
N/A	ROSS Controls Safety Book	A10264
505	DM²™ Crossflow™ SERPAR® 3/2 Double Valves with Total Dynamic Monitoring and Memory	A10295
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/rosslit.htm.

General Information

Standard Specifications

The standard specifications for the products on each page of this catalog are given on the same page. 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 other makes. The C_V ratings given here are intended only for use with performance charts published by ROSS.*

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, 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.

All products without the "W" prefix may be ordered with thread types other than NPT according to the chart on the right.

Order Placement

For order placement, consult ROSS or your local ROSS distributor on the back 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
W	Accept NPT, DIN 259, ISO 228/1, BSP Pl or Tr, or JIS B0203 threads	Accept NPSC, G, or PF threads

*Used only for filters, regulators, lubricators.

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

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.

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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.

Printed in the U.S.A. - REV. 5/06

Form A10085