CATALOG 104F

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.

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

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

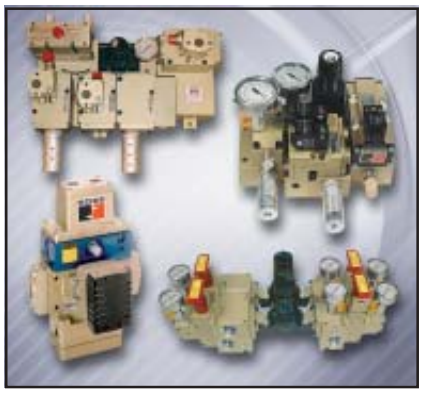
*Used only for filters, regulators, lubricators.

Industry Solutions

Glass Bottle Machines

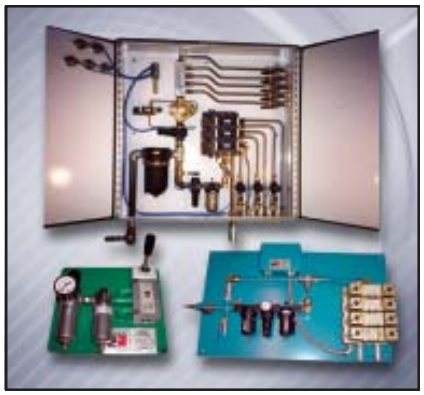
- Valves designed for repeatability
- Counterblow vacuum valves
- Hi/low pressure valves
- Plunger up/down & cooling valves
- Blowhead on/off valve including kickoff
- Mold open/close valves
- Pusher valves
- Blow mold vacuum valves
- Final blow Slimline™ valves with quick exhaust or pressure booster 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 & hydraulic double valves for clutch/brake control
- CrossMirror® 3 & 4-way valves
- 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)

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

Visit the ROSS website at www.rosscontrols.com to fully explore the premium pneumatic, electronic, and hydraulic 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 our customers' equipment and operations.

Safety Products

- Control-reliable 3/2 and 5/2 pneumatic valves
- Control-reliable hydraulic valves
- Pneumatic & hydraulic internally monitored double valves for safety applications
- HOZE-FUZE™ to prevent hose whip
- Pilot operated check valves (single 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 & hydraulic double valves for integration with external monitoring systems
- Lock-out verification accessories
- Spring locked & detented hand valves
- Guarded foot pedal 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 through A10191J

Plastic Forming Machines

- 40 Bar valves for PET blow molding
- Compact primary/pressure select manifold assemblies
- All designed for high speed & repeatability over the life of the valve
- High pressure FRL's
- Cam actuators for wheel machines
- Serial bus valve manifolds
- Safety interlock valves
- Proportional pre-blow/blow systems
- Pre-blow/blow/operational air manifold systems
- For details, request Bulletin 470, ROSS literature form number A10189

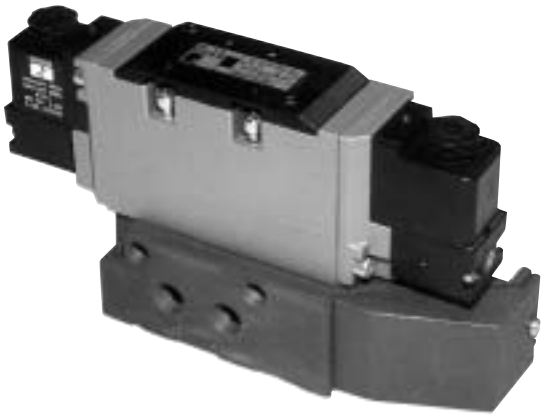
General Automation Products

- 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
- For details, request our CD-ROM Master Catalog (ROSS literature form number A10125)
- 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

Now You Can Choose the Valve That is Best for Your Requirements, Without Making Compromises.

Features of ROSS Line-Mount Valves

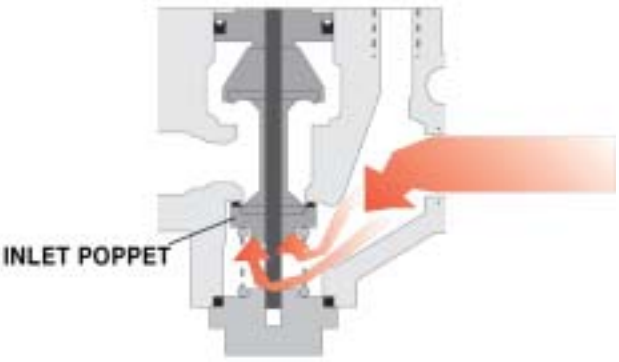
1. Low weight; compact size.
2. **LOGICAIR**® adaptors provide special functions—
   - Timed sequence actuation and/or deactuation
   - Momentary control of actuation/deactuation from one pressure source
   - Actuating force multiplier, for use with low signal pressures
3. Available with your choice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

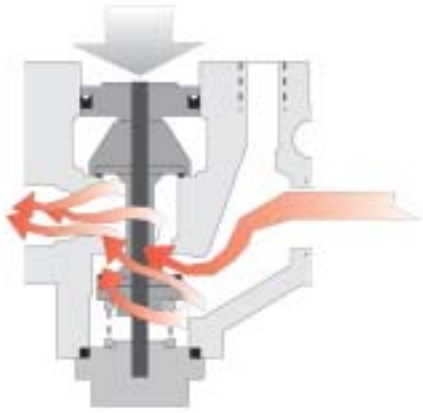
Inlet air pressure forces the inlet poppet upward, pushing the poppet seal firmly against the seat. The higher the inlet pressure, the greater is the sealing force. Note that the seal is engaged perpendicular to the seat; there is no sliding action to damage and wear the seal.



Self Cleaning

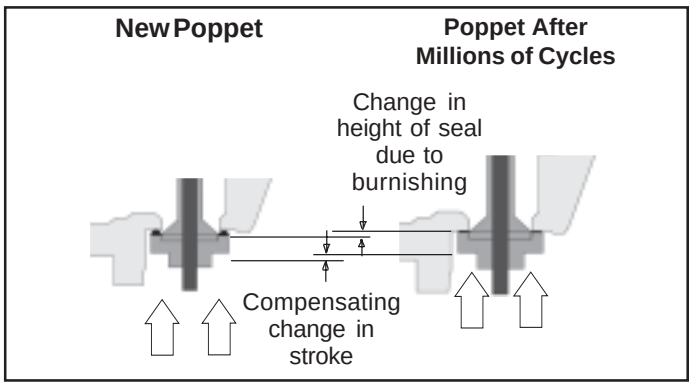
The flow velocity for a given volume of air is dependent upon the area through which it is flowing. The smaller the area, the greater the velocity.

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



Self-Compensating for Wear

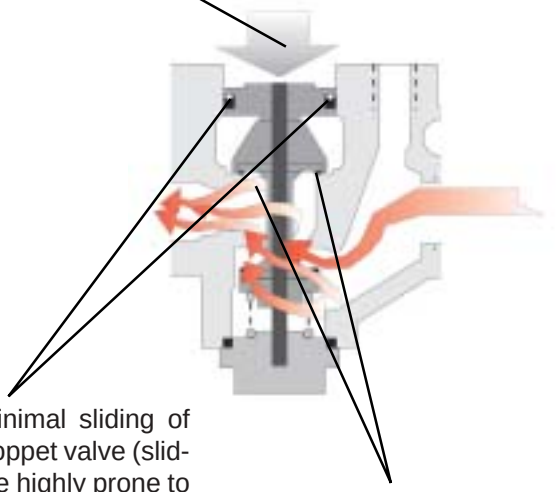
Because of the poppet valve's design, any change in the height of the valve seal (due to burnishing) is automatically compensated for by an equal change in the length of stroke. Therefore, the sealing force remains constant over the entire life of the valve.



Sure Shifting (Repeatable 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.

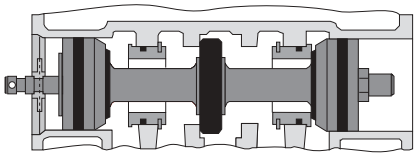
When pilot air is exhausted, the inlet pressure produces an extremely strong upward force, reliably shifting the valve to a closed position.

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

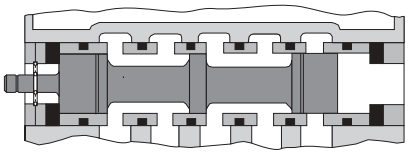


BENEFITS
- Very dependable
- Tolerant of dirty air
- Positive seating
- Fast response
- Long service life
- Low maintenance
- Repeatability

APPLICATIONS
- Where there is no lubricated air
- Where the air is dirty (steel mills, glass plants, foundries)
- 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

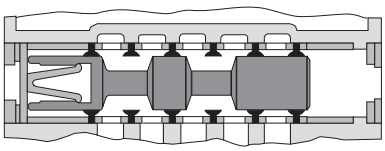
Stainless steel spools move on an extremely thin film of air in the micro-inch clearance between spool and sleeve.

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

Resilient Seal Spool- ISO W63 Series

Resilient seals are forced against the spool, providing a very tight seal without excessive friction.

FEATURES
- Balanced spool
- Mechanical detent
- Requires little lubrication
- Almost no leakage



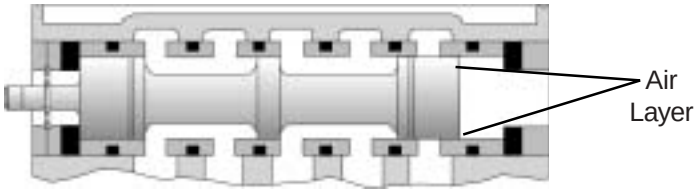
BENEFITS
- Minimal breakaway/running friction
- Available in 5-port, 2- and 3-position designs, single or double control, open or closed center

APPLICATIONS
- Dual-pressure circuits
- Vacuum circuits
- Food processing

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.



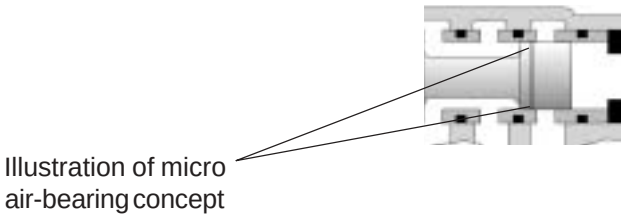
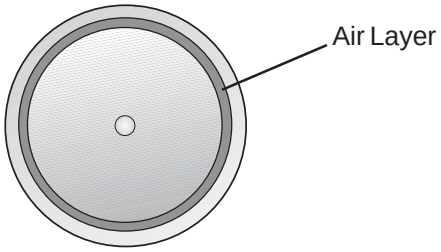


Illustration of micro air-bearing concept

Low-friction Spool

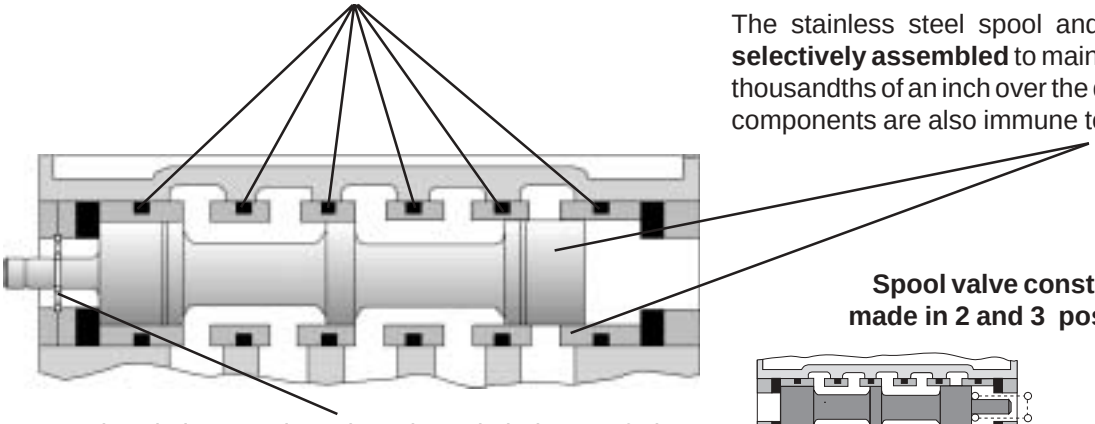
The spool is separated from, actually *floating* within, the sleeve. The thin film of air creates an *air bearing* which virtually eliminates sliding friction between the spool and sleeve during shifting.



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

Other Significant Features

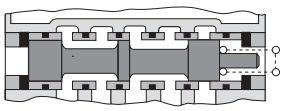
"O" rings isolate the precision steel sleeve from valve body and mounting torque distortions. O-rings are static and are not subject to dynamic wear.



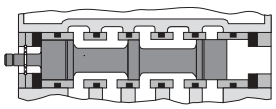
The stainless steel spool and sleeve are **matched and selectively assembled** to maintain a clearance of 1 to 2 ten-thousandths of an inch over the diameter. The stainless steel components are also immune to most chemicals.

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 will maintain the intended position.

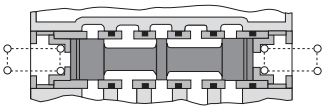
Spool valve construction can be made in 2 and 3 position functions.



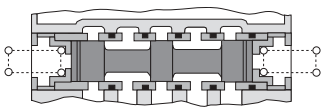
Single Control (2 position)



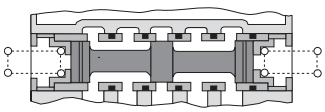
Double Momentary [Impulse] Control (2 position)



Power Center Double Control (3 position)



Closed Center, Double Control (3 position)

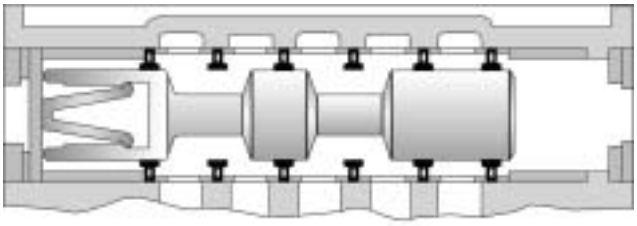


Open Center, Double Control (3 position)

The ROSS Resilient Seal Spool Valve ...when you need one, ROSS is the one to choose

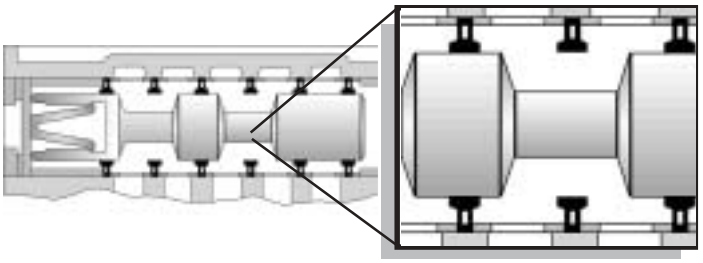
Balanced Design

Internal pressures, attempting to drive the spool right or left, apply equal force to each spool area, establishing a balance. Therefore, inlet pressure or back pressure may be applied to any one or more ports without affecting the balance.



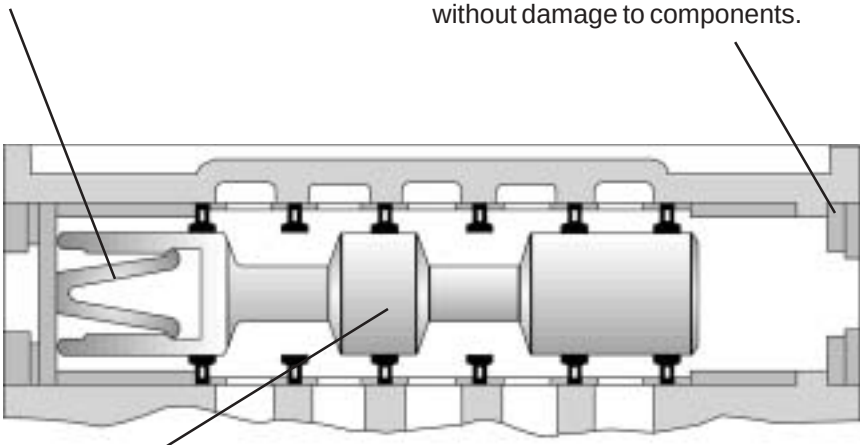
Special "Y" shaped seals provide a number of beneficial **sealing and wear characteristics**, such as:

- Air pressure assisted sealing
- Seal wear is compensated for by flexibility
- Seal shape and nature of material result in ability to tolerate small variations in spool/bore diameters
- Spacers can firmly grip and retain seals without distorting their shape
- Seals roll with initial spool movement reducing breakaway friction



All two position valves are supplied with a **mechanical detent** to physically hold the spool in position when the pilot signal is removed.

Cushions absorb the force of the shifting spool without damage to components.



Spool of low-weight material and low-friction surfaces.

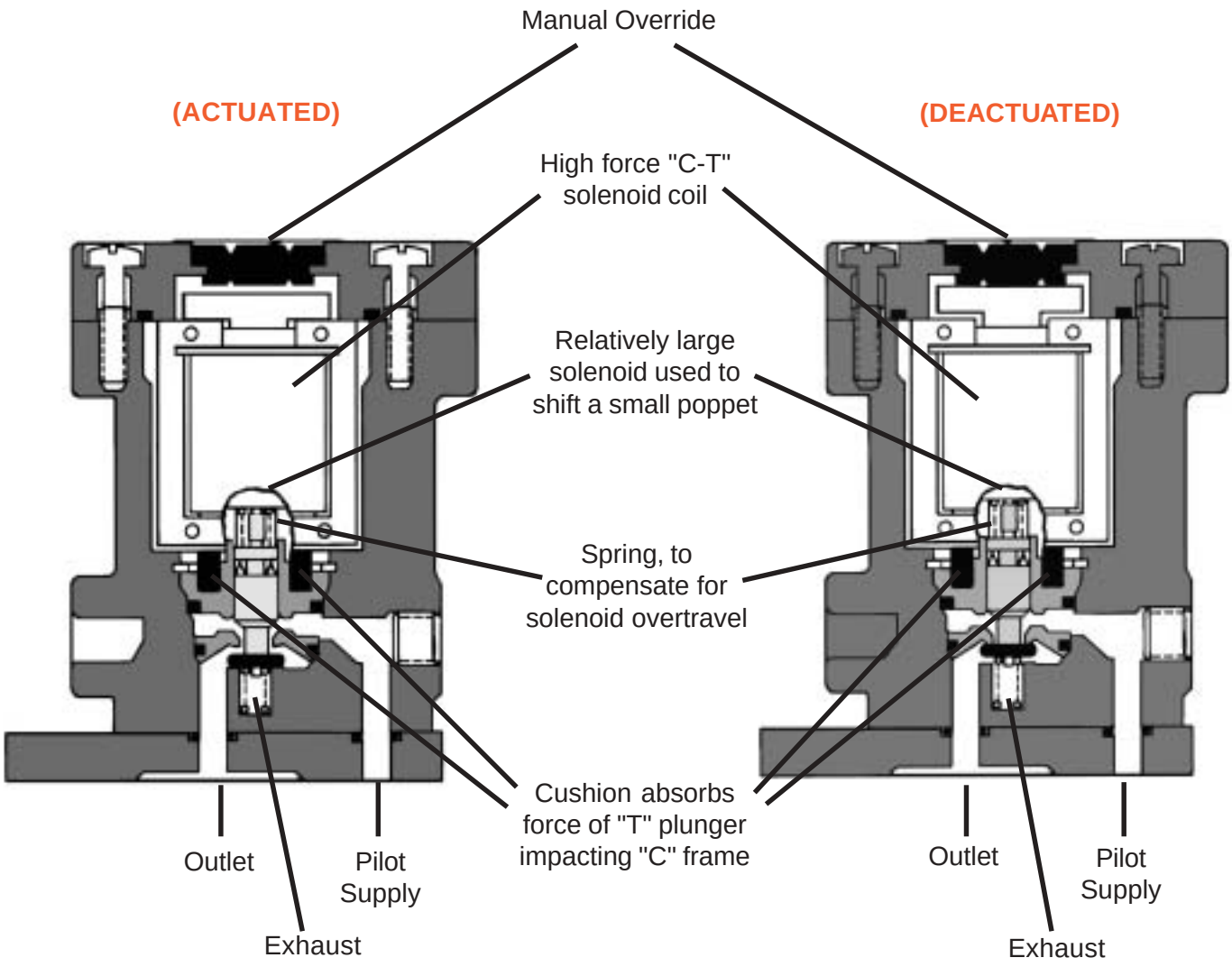
Available in the following configurations:

- Single Control
- Double Momentary [Impulse] Control
- Closed Center, Double Control
- Open Center, Double Control
- Pressure Center, Double Control

ROSS Solenoid Pilots

ROSS solenoid pilots are basically small, direct solenoid actuated, 3-way poppet valves. They are often the preferred way to actuate another valve because, with a solenoid force of only 2-3 pounds, you can direct full line pressure to the actuation piston of the main valve. This means the resulting force to shift the main valve can be hundreds of pounds, producing a very fast, consistent and reliable valve actuation.

ROSS PACER® Solenoid Pilot

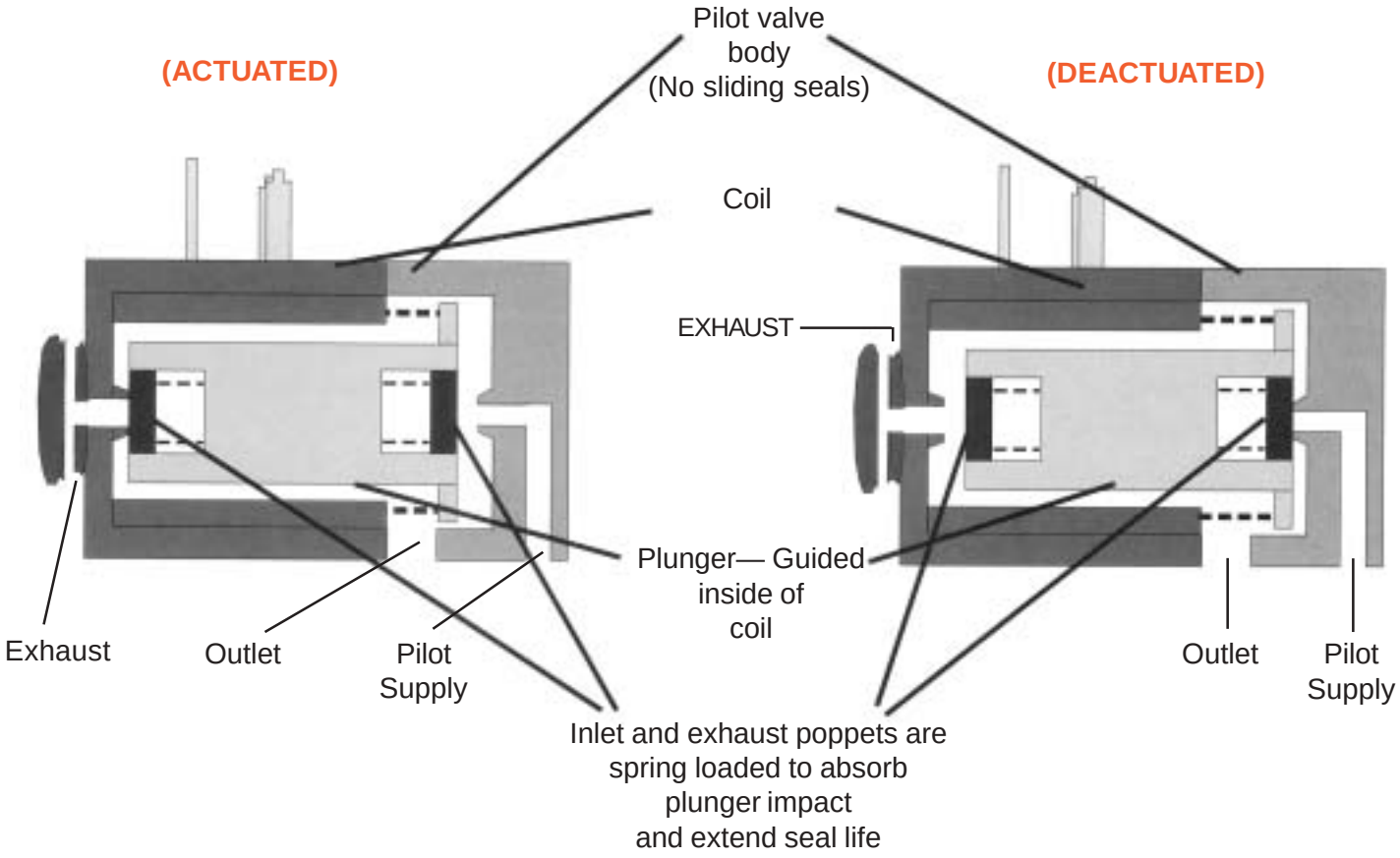


ROSS Solenoid Pilots

Poppet construction is ideal for solenoid pilots in other respects, too. These valves have a short stroke, very high flow and are self-compensating for wear. They are also very compact; the majority of the valve is housed inside the coil. A high-efficiency coil is used to minimize the amount of electrical current required. Low current requirements also make solenoid pilots compatible with today's electronic controls.

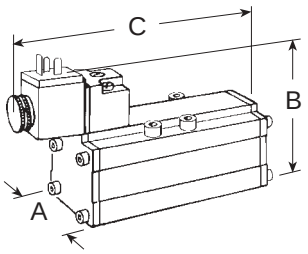
ROSS solenoid pilots are available in AC or DC voltages to control all sizes of pneumatic valves.

Compact Solenoid Pilot



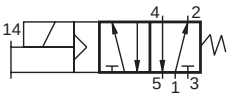
W60 Spool & Sleeve Valves for ISO Bases (5599/I)

5/2 Valves – Single Solenoid Pilot Spring Return

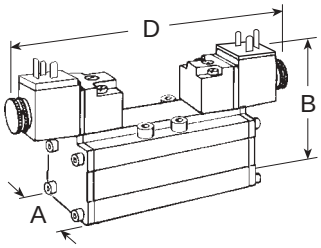


ISO Size	Avg. C_v	Range of Port Sizes	Valve Model Numbers*	Weight lb. (kg.)
1	0.8	1/8 - 3/8	W6076B2401	1.5 (0.7)
2	1.9	3/8 - 1/2	W6076B3401	2 (0.9)
3	3.8	1/2 - 3/4	W6076B4401	3.5 (1.6)

* Base and electrical connector not included. See pages 20-21 for accessories.

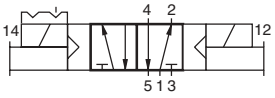


5/2 Valves – Double Solenoid Pilot Momentary Control

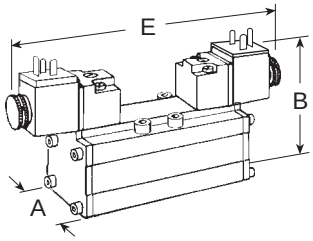


ISO Size	Avg. C_v	Range of Port Sizes	Valve Model Numbers*	Weight lb. (kg.)
1	0.8	1/8 - 3/8	W6076B2407	2.0 (0.9)
2	1.9	3/8 - 1/2	W6076B3407	2.5 (1.1)
3	3.8	1/2 - 3/4	W6076B4407	4.0 (1.8)

* Base and electrical connector not included. See pages 20-21 for accessories.

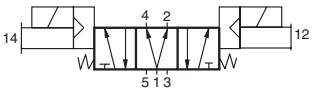


5/3 Valves – Double Solenoid Pilot

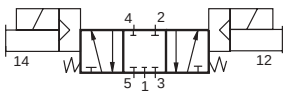


ISO Size	Avg. C_v	Range of Port Sizes	Valve Model Numbers* Power Center	Closed Center	Open Center	Weight lb. (kg.)
1	0.8	1/8 - 3/8	W6077A2951	W6077B2401	W6077B2407	2.0 (0.9)
2	1.9	3/8 - 1/2	W6077A3945	W6077B3401	W6077B3407	2.5 (1.1)
3	3.8	1/2 - 3/4	W6077B4934	W6077B4401	W6077B4407	4.0 (1.8)

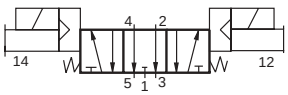
* Base and electrical connector not included. See pages 20-21 for accessories.



POWER CENTER



CLOSED CENTER



OPEN CENTER

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

IMPORTANT NOTE
Please read carefully and thoroughly all of the **CAUTIONS** on page 89.

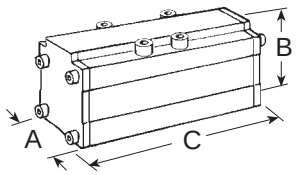
OVERALL DIMENSIONS inches (mm)

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)

STANDARD SPECIFICATIONS: For valves on this page.
Solenoids: AC or DC power. See page 3 for voltages.
Power Consumption: Each solenoid; 11 VA inrush, 8.5 VA holding on 50 or 60 HZ; 6 watts on d.c.
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.

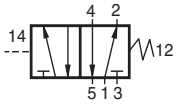
W60 Spool & Sleeve Valves for ISO Bases (5599/I)

5/2 Valves – Single Pressure Control Spring Return

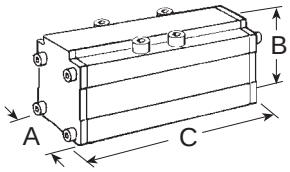


ISO Size	Avg. C_v	Range of Port Sizes	Valve Model Numbers*	Weight lb. (kg)
1	0.8	1/8 - 3/8	W6056B2411	0.8 (0.4)
2	1.9	3/8 - 1/2	W6056B3411	1.5 (0.7)
3	3.8	1/2 - 3/4	W6056B4411	3.0 (1.4)

* Base not included. See pages 20-21 for accessories.

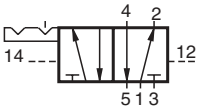


5/2 Valves – Double Pressure Momentary Control

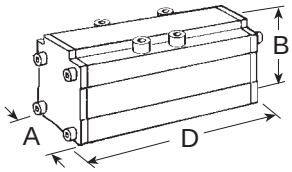


ISO Size	Avg. C_v	Range of Port Sizes	Valve Model Numbers*	Weight lb. (kg)
1	0.8	1/8 - 3/8	W6056B2417	0.8 (0.4)
2	1.9	3/8 - 1/2	W6056B3417	1.5 (0.7)
3	3.8	1/2 - 3/4	W6056B4417	3.0 (1.4)

* Base not included. See pages 20-21 for accessories.

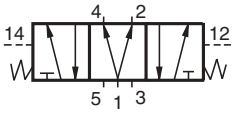


5/3 Valves – Double Pressure Control

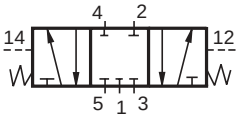


ISO Size	Avg. C_v	Range of Port Sizes	Valve Model Numbers*			Weight lb. (kg)
			Power Center	Closed Center	Open Center	
1	0.8	1/8 - 3/8	W6057A2934	W6057B2411	W6057B2417	1.0 (0.5)
2	1.9	3/8 - 1/2	W6057A3933	W6057B3411	W6057B3417	1.5 (0.7)
3	3.8	1/2 - 3/4	—	W6057B4411	W6057B4417	3.0 (1.4)

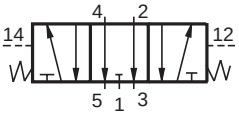
* Base not included. See pages 20-21 for accessories.



POWER CENTER



CLOSED CENTER



OPEN CENTER

IMPORTANT NOTE
Please read carefully and thoroughly all of the **CAUTIONS** on page 89.

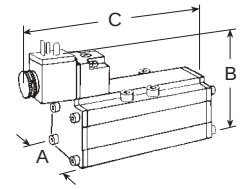
OVERALL DIMENSIONS inches (mm)

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)

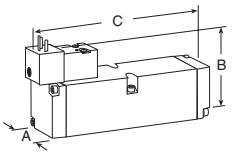
STANDARD SPECIFICATIONS: For valves on this page.
Ambient Temperature: 40° to 175° F (4° to 80° C.)
Media Temperature: 40° to 175° F (4° to 80° C).
Flow Media: Filtered air. 5 micron recommended.
Inlet Pressure: Vacuum to 150 psig (10 bar).
Pilot Pressure:
Size 1: At least 30 psig (2 bar).
Size 2 and 3: At least 15 psig (1 bar).

W63 Resilient Seal Spool Valves for ISO Bases (5599/I)

5/2 Valves – Single Solenoid Pilot Air Return



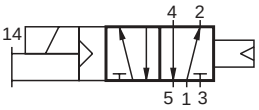
Sizes 1, 2, & 3



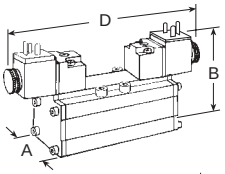
Size 0

ISO Size	Avg. C_v	Range of Port Sizes	Valve Model Numbers*	Weight lb. (kg)
0	1.2	1/4	W6376B1401	1.0 (0.5)
1	0.8	1/8 - 3/8	W6376B2401	1.3 (0.6)
2	1.9	3/8 - 1/2	W6376B3401	1.8 (0.8)
3	3.8	1/2 - 3/4	W6376B4401	2.8 (1.3)

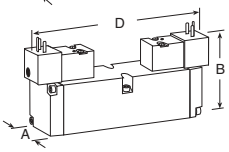
* Base and electrical connector not included. See pages 20-23 for accessories.



5/2 Valves – Double Solenoid Pilot Momentary Control



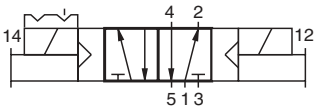
Sizes 1, 2, & 3



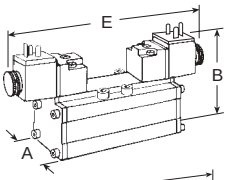
Size 0

ISO Size	Avg. C_v	Range of Port Sizes	Valve Model Numbers*	Weight lb. (kg)
0	1.2	1/4	W6376B1407	1.0 (0.5)
1	0.8	1/8 - 3/8	W6376B2407	1.3 (0.6)
2	1.9	3/8 - 1/2	W6376B3407	2.3 (1.0)
3	3.8	1/2 - 3/4	W6376B4407	3.3 (1.5)

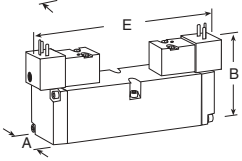
* Base and electrical connector not included. See pages 20-23 for accessories.



5/3 Valves – Double Solenoid Pilot



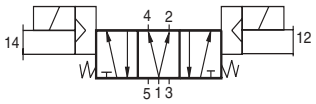
Sizes 2 & 3



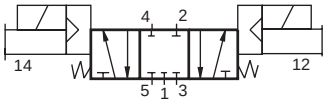
Size 0

ISO Size	Avg. C_v	Range of Port Sizes	Valve Model Numbers* Power Center	Closed Center	Open Center	Weight lb. (kg)
0	0.9	1/4	—	W6377B1401	W6377B1407	1.2 (0.5)
2	1.9	3/8 - 1/2	—	W6377C3401	W6377C3407	3.0 (1.4)
3	3.8	1/2 - 3/4	—	W6377B4401	W6377B4407	4.3 (1.9)

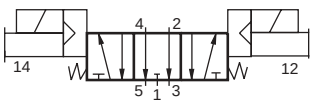
* Base and electrical connector not included. See pages 20-23 for accessories.



POWER CENTER



CLOSED CENTER



OPEN CENTER

IMPORTANT NOTE
Please read carefully and thoroughly all of the **CAUTIONS** on page 89

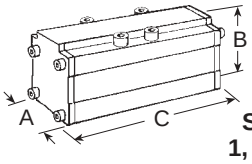
OVERALL DIMENSIONS inches (mm)

Size	A	B	C	D	E
0	1.0 (26)	3.2 (81)	4.8 (122)	5.2 (132)	5.2 (132)
1	1.7 (42)	3.2 (82)	5.9 (105)	6.7 (170)	–
2	2.1 (54)	3.5 (90)	7.7 (196)	7.7 (196)	7.8 (199)
3	2.6 (66)	3.7 (94)	7.1 (181)	7.8 (198)	8.3 (211)

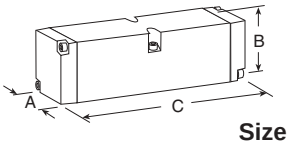
STANDARD SPECIFICATIONS: For valves on this page.
Solenoids: AC or DC power. See page 3 for voltages.
Power Consumption: Each solenoid.
ISO 0 – 3.7 VA inrush, 3.1 VA holding on 50 or 60 Hz; 3 watts on d.c.
ISO 1, 2, and 3 – 11 VA inrush, 8.5 VA holding on 50 or 60 Hz; 6 watts on d.c.
Ambient Temperature: 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 30 psig (2 bar).
Internal/External Supply: Selected automatically.

W63 Resilient Seal Spool Valves for ISO Bases (5599/I)

5/2 Valves – Single Pressure Control Air Return



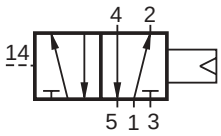
Sizes 1, 2, & 3



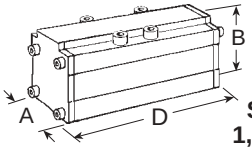
Size 0

ISO Size	Avg. C_v	Range of Port Sizes	Valve Model Numbers*	Weight lb. (kg)
0	1.2	1/4	W6356A1411	0.8 (0.4)
1	0.8	1/8 - 3/8	W6356B2411	0.8 (0.4)
2	1.9	3/8 - 1/2	W6356B3411	1.3 (0.6)
3	3.8	1/2 - 3/4	W6356B4411	2.3 (1.0)

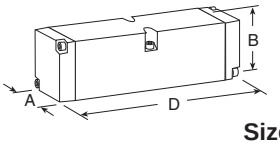
* Base not included. See pages 20-23 for accessories.



5/2 Valves – Double Pressure Control Momentary Control



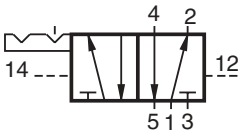
Sizes 1, 2, & 3



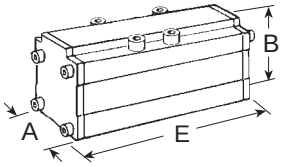
Size 0

ISO Size	Avg. C_v	Range of Port Sizes	Valve Model Numbers*	Weight lb. (kg)
0	1.2	1/4	W6356B1417	0.8 (0.4)
1	0.8	1/8 - 3/8	W6356B2417	0.8 (0.4)
2	1.9	3/8 - 1/2	W6356B3417	1.3 (0.6)
3	3.8	1/2 - 3/4	W6356B4417	2.3 (1.0)

* Base not included. See pages 20-23 for accessories.



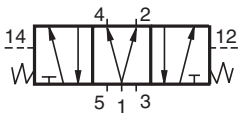
5/3 Valves – Double Pressure Control



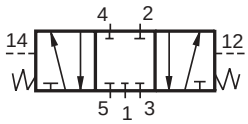
(Use A-B-E dimensions for closed center.)

ISO Size	Avg. C_v	Range of Port Sizes	Valve Model Numbers*			Weight lb. (kg)
			Power Center	Closed Center	Open Center	
2	1.9	3/8 - 1/2	—	W6357C3411	W6357C3417	1.3 (0.6)
3	3.8	1/2 - 3/4	—	W6357B4411	W6357B4417	2.3 (1.0)

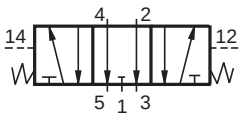
* Base not included. See pages 20-23 for accessories.



POWER CENTER



CLOSED CENTER



OPEN CENTER

IMPORTANT NOTE
Please read carefully and thoroughly all of the **CAUTIONS** on page 89.

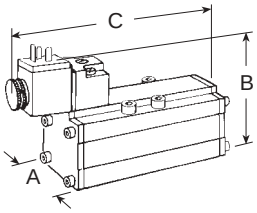
OVERALL DIMENSIONS inches (mm)

Size	A	B	C	D	E
0	1.0 (26)	1.7 (42)	4.5 (117)	4.2 (107)	–
1	1.8 (46)	1.9 (48)	4.8 (122)	4.3 (110)	–
2	2.1 (53)	2.2 (57)	6.0 (152)	5.2 (133)	6.2 (158)
3	2.3 (58)	2.8 (71)	6.9 (175)	6.1 (154)	8.3 (209)

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: At least 30 psig (2 bar).

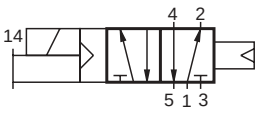
W64 Poppet Valves for ISO Bases (5599/I)

5/2 Valves – Single Solenoid Pilot Air Return

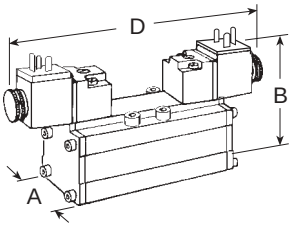


ISO Size	Avg. C_v	Range of Port Sizes	Valve Model Numbers* Std. Temp.	Valve Model Numbers* High Temp.	Weight lb. (kg)
1	1.0	1/8 - 3/8	W6476B2401	W6476B2402	1.3 (0.6)
2	2.0	3/8 - 1/2	W6476B3401	W6476B3402	1.8 (0.8)
3	4.0	1/2 - 3/4	W6476B4401	W6476B4402	2.8 (1.3)

* Base and electrical connector not included. See pages 20-21 for accessories.

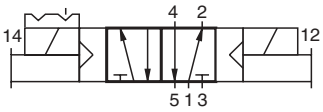


5/2 Valves – Double Solenoid Pilot Momentary Control



ISO Size	Avg. C_v	Range of Port Sizes	Valve Model Numbers* Std. Temp.	Valve Model Numbers* 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 20-21 for accessories.



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

IMPORTANT NOTE
Please read carefully and thoroughly all of the **CAUTIONS** on page 89.

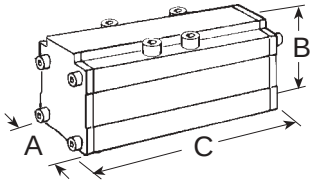
OVERALL DIMENSIONS inches (mm)

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)

STANDARD SPECIFICATIONS: For valves on this page.
Solenoids: AC or DC power. See page 3 for voltages.
Power Consumption: Each solenoid; 11 VA inrush, 8.5 VA holding on 50 or 60 Hz; 6 watts on d.c.
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.

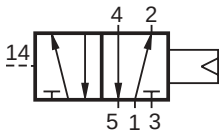
W64 Poppet Valves for ISO Bases (5599/I)

5/2 Valves – Single Pressure Control Air Return

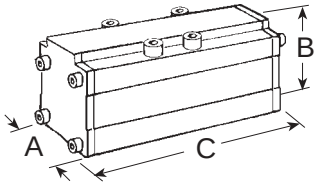


ISO Size	Avg. C_v	Range of Port Sizes	Valve Model Numbers* Std. Temp.	Valve Model Numbers* High Temp.	Weight lb. (kg)
1	1.0	1/8 - 3/8	W6456B2411	W6456B2412	.8 (.4)
2	2.0	3/8 - 1/2	W6456B3411	W6456B3412	1.3 (.6)
3	4.0	1/2 - 3/4	W6456B4411	W6456B4412	2.3 (1.0)

* Base not included. See pages 20-21 for accessories.

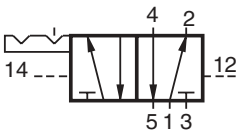


5/2 Valves – Double Pressure Control Momentary



ISO Size	Avg. C_v	Range of Port Sizes	Valve Model Numbers* Std. Temp.	Valve Model Numbers* 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 20-21 for accessories.



IMPORTANT NOTE
Please read carefully and thoroughly all of the **CAUTIONS** on page 89.

OVERALL DIMENSIONS inches (mm)

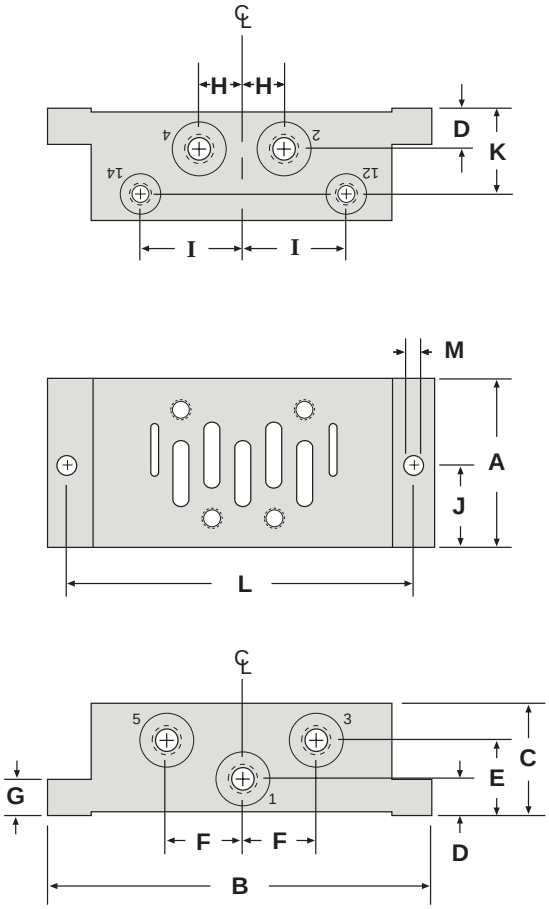
Size	A	B	C
1	1.6 (41)	1.8 (46)	4.3 (109)
2	2.1 (53)	2.1(54)	5.1 (130)
3	2.6 (66)	2.2 (56)	6.4 (165)

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.

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
1	654K91	–	1/8	1/4	1/8
	600C01	659K91	1/4	1/4	1/8
	D600C01	–	G1/4	G1/4	G1/8
	642K91	–	3/8	3/8	1/8
2	601C01	660K91	3/8	3/8	1/8
	D601C01	–	G3/8	G3/8	G1/8
	643K91	–	1/2	1/2	1/8
3	602C01	661K91	1/2	1/2	1/8
	D602C01	–	G1/2	G1/2	G1/8
	644K91	–	3/4	3/4	1/8



Sub-base Dimensions inches (mm)

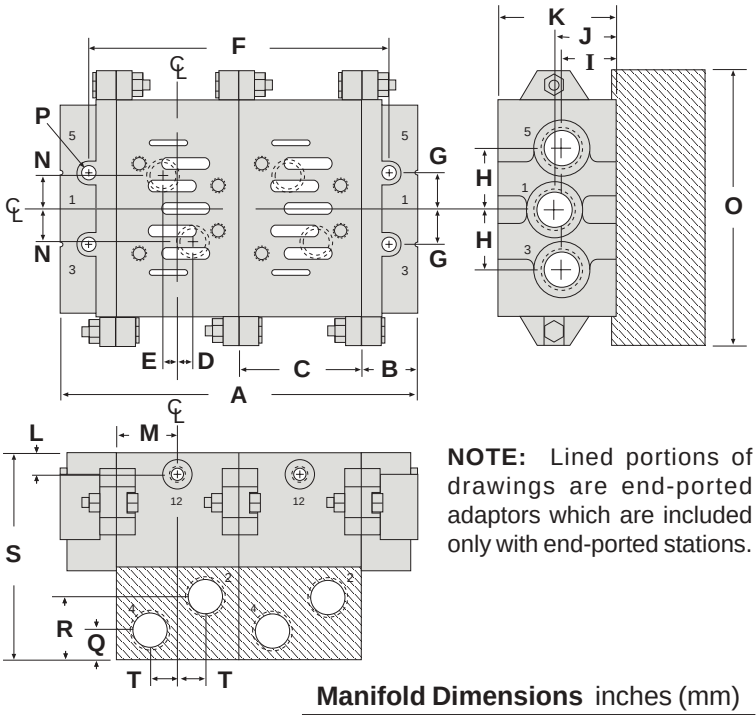
	ISO 1	ISO 2	ISO 3
A	1.89 (48)	2.24 (57)	2.80 (71)
B	4.33 (110)	4.88 (124)	5.87 (149)
C	1.26 (32)	1.57 (40)	1.26 (32)*
D	0.41 (11)	0.55 (14)	0.67 (17)
E	0.85 (22)	1.02 (26)	0.67 (17)
F	0.85 (22)	1.10 (28)	1.34 (34)
G	0.39 (10)	0.51 (13)	0.71 (18)
H	0.47 (12)	0.59 (15)	0.63 (16)
I	1.14 (29)	1.46 (37)	1.77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

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

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

MANIFOLD NUMBERS and PORT SIZES

ISO Size	Bottom Ported Station	End Ported Station	End Station Kit	Port Sizes 2, 4	1, 3, 5	12, 14
1	460K91	664K91	326K86	1/4	3/8	1/8
	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 21.

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)

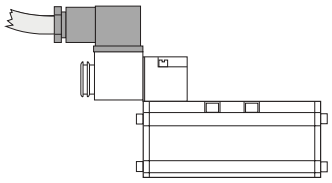
Accessories for ISO 5599/I Valves

CONNECTORS for use with DROPCORDS

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**

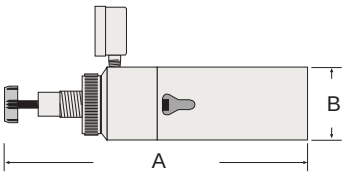
BLOCKING DISKS

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

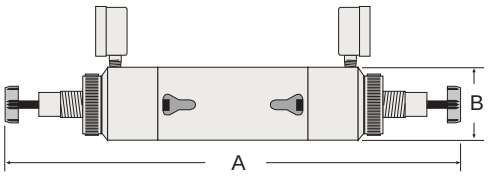
	Single Disk	Kit of 3 Disks
ISO Size 1:	**235A40**	**1007K77**
ISO Size 2:	**236A40**	**1008K77**
ISO Size 3:	**253A40**	**1009K77**

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



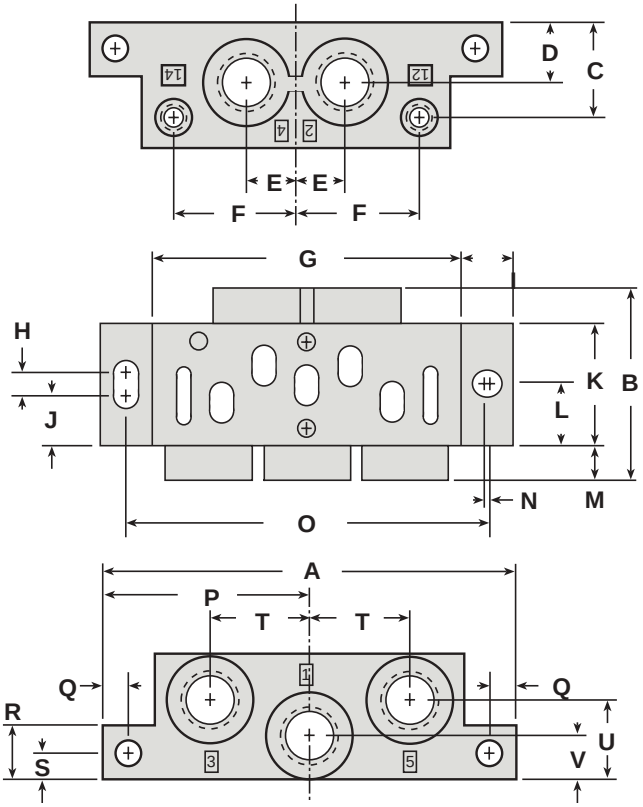
Double Regulator

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)

Bases for Series W63 Size 0 VDMA 24563 Valves



SUB-BASE NUMBERS and PORT SIZES

Sub-Base Numbers	Port Sizes 1, 2, 4	3, 5	12, 14	WEIGHT lb(kg)
1144C91	1/4	1/4	M5	0.2 (0.1)
D1144C91	G 1/4	G 1/4	M5	0.2 (0.1)

SUB-BASE DIMENSIONS inches (mm)

A	3.7 (92)	**L**	0.5 (14)
B	1.7 (42)	**M**	0.3 (8)
C	0.8 (21)	**N**	0.04 (1)
D	0.5 (14)	**O**	3.2 (81)
E	0.4 (11)	**P**	1.9 (46)
F	1.1 (28)	**Q**	0.2 (6)
G	2.8 (69)	**R**	0.5 (12)
H	0.2 (5)	**S**	0.2 (6)
I	0.5 (12)	**T**	0.9 (22)
J	0.4 (11)	**U**	0.7 (18)
K	1.1 (27)	**V**	0.4 (10)

Accessories for Series W63 Size 0 VDMA 24563 Valves

- **LED indicator lights**
- **Built-in surge suppressors**

CONNECTORS for use with DROPCORDS
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 left of the valve centerline. Includes a strain relief nut, that accepts a 5-mm diameter cord, a gasket and a mounting screw.

Connector Type	Model Number
For use with dropcord (cord not included)	1604K77*
Wired with 5-mm diameter cord (Cord length - 2 meters)	1605K77*

*Specify solenoid voltage.

WIRED CONNECTORS
Connectors have a 6-1/2 foot (2 meters) cord with three 20-gauge conductors. Cord exits outboard. Insulation is water, oil, and abrasion resistant. Connectors are available with 5-mm diameter cords. Includes gasket and mounting screw.

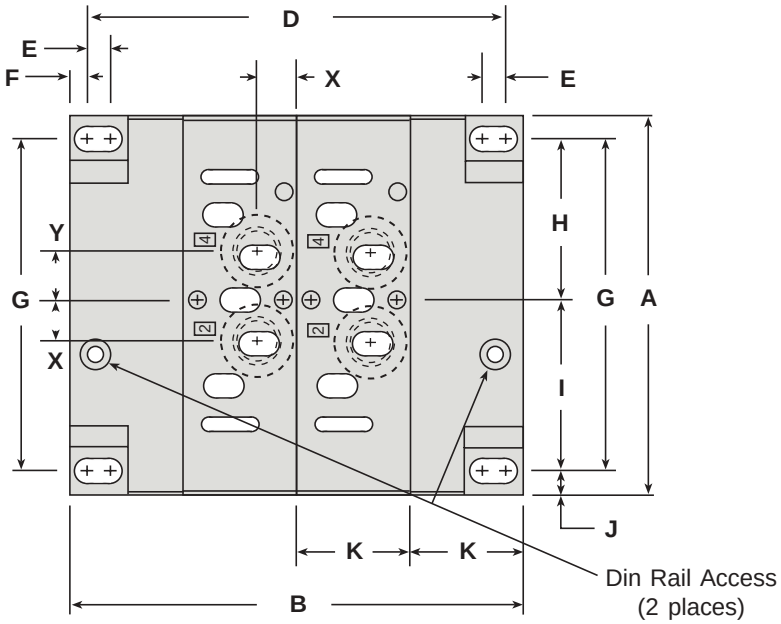
BLOCKING DISKS FOR INLET/EXHAUST PORTS
Ports 1, 3, and 5, between manifold stations, can be closed with blocking disks which are available in kits of three disks. **1600K77**

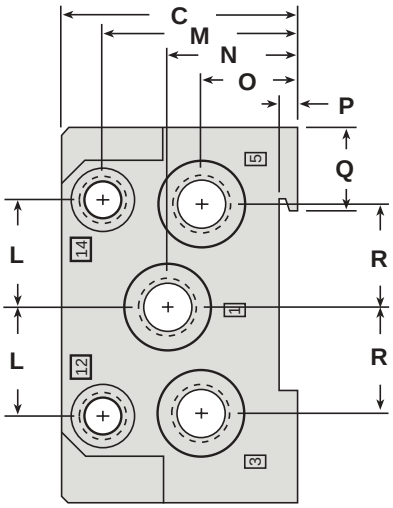
BLOCKING DISKS FOR CONTROL PORTS
Ports 12 and 14, between manifold stations, can be closed with blocking disks which are available in kits of two disks. **1601K77**

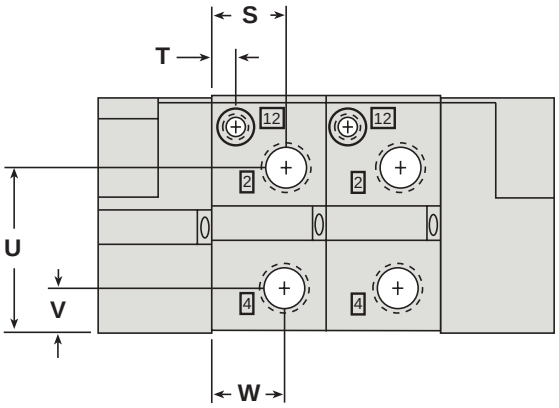
BLANK STATION KIT
A blank station plate is used to cover the top of a manifold station that is not in use. A kit consists of a metal plate 0.4 inch (10 mm) thick, a gasket, and mounting bolts. **1602K77**

DIN RAIL MOUNTING KIT
A cam assembly is used to mount a manifold assembly (through the end-station plates) to a din rail. A kit consists of two cam assemblies (rail not included). **1603K77**

Manifolds for Series W63 Size 0 VDMA 24563 Valves







MANIFOLD DIMENSIONS
inches (mm)

A	3.5	(90)	**N**	1.2	(31)
B	4.3	(108)	**O**	0.9	(23)
C	2.2	(55)	**P**	0.2	(5)
D	3.9	(100)	**Q**	0.8	(20)
E	0.2	(5)	**R**	1.0	(25)
F	0.2	(5)	**S**	0.7	(18)
G	3.1	(78)	**T**	0.2	(5)
H	1.5	(39)	**U**	1.5	(39)
I	1.5	(39)	**V**	0.4	(11)
J	0.3	(8)	**W**	0.7	(17)
K	1.1	(27)	**X**	0.4	(10)
L	1.0	(26)	**Y**	0.5	(12)
M	1.8	(47)			

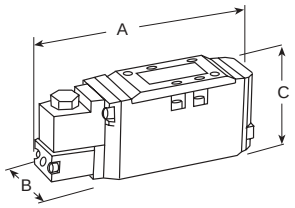
MANIFOLD NUMBERS and PORT SIZES

	Manifold Numbers	Port Sizes 1, 3, 5	Port Sizes 2, 4	Port Sizes 12, 14	WEIGHT lb (kg)
End Ported	1145C91	–	1/4	M5	0.4 (0.2)
	D1145C91	–	G 1/4	M5	0.4 (0.2)
Bottom Ported	1146C91	–	1/4	M5	0.4 (0.2)
	D1146C91	–	G 1/4	M5	0.4 (0.2)
End Station Kit	519B86	3/8	–	1/8	0.7 (0.3)
	D519B86	G 3/8	–	G 1/8	0.7 (0.3)

End Station Kit : In addition to the necessary manifold stations, an end station kit must be ordered for each manifold installation.

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

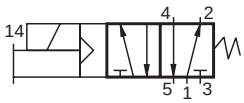
5/2 Valves – Single Solenoid Pilot



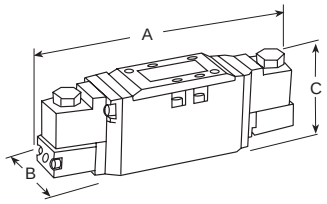
ISO Size	Avg. C_v	Port Size	Valve Model Number*	Weight lb. (kg)
1	1.0	1/4-3/8	W6576A2401	1.5 (0.7)
2	2.3	3/8-1/2	W6576A3401	2.0 (1.0)
3	3.4	1/2-3/4	W6576A4401	3.5 (1.6)

*See pages 26-28 for accessories. Valve dimensions on page 25.

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.

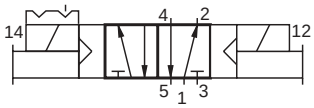


5/2 Valves – Double Solenoid Pilot

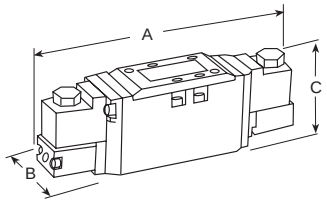


ISO Size	Avg. C_v	Port Size	Valve Model Number*	Weight lb. (kg)
1	1.0	1/4-3/8	W6576A2407	2.0 (1.0)
2	2.3	3/8-1/2	W6576A3407	2.5 (1.2)
3	3.4	1/2-3/4	W6576A4407	4.0 (1.9)

*See pages 26-28 for accessories. Valve dimensions on page 25.

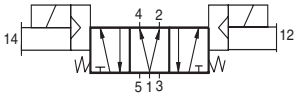


5/3 Valves – Double Solenoid Pilot

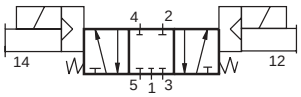


ISO Size	Avg. C_v	Port Size	Valve Model Number* Power Center	Closed Center	Open Center	Weight lb. (kg)
1	1.0	1/4-3/8	W6577A2902	W6577A2401	W6577A2407	2.0 (1.0)
2	2.3	3/8-1/2	W6577A3901	W6577A3401	W6577A3407	2.5 (1.2)
3	3.4	1/2-3/4	W6577A4900	W6577A4401	W6577A4407	4.0 (1.9)

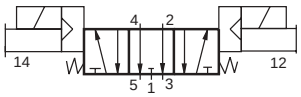
* See pages 26-28 for accessories. Valve dimensions on page 25.



POWER CENTER



CLOSED CENTER



OPEN CENTER

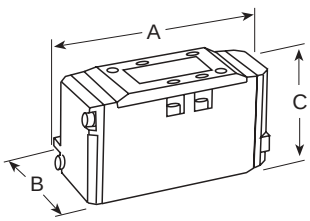
IMPORTANT NOTE
Please read carefully and thoroughly all of the **CAUTIONS** on page 89.

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 d.c.

Power Consumption: Each solenoid. 6.5 VA holding on 50 or 60 Hz; 3.5 watts on d.c. (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).

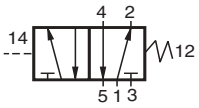
W65 Spool and Sleeve Valves for ISO Bases (5599/II)

5/2 Valves – Single Remote Pressure Control Spring Return

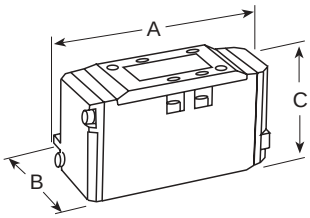


ISO Size	Avg. C_v	Port Size	Valve Model Number*	Weight lb. (kg)
1	1.0	1/4-3/8	W6556A2411	0.8 (0.4)
2	2.3	3/8-1/2	W6556A3411	1.5 (0.7)
3	3.4	1/2-3/4	W6556A4411	3.0 (1.4)

*See pages 26-28 for accessories. Valve dimensions shown below.

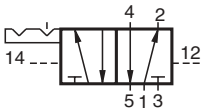


5/2 Valves – Double Remote Pressure Momentary Control

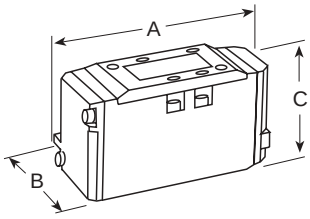


ISO Size	Avg. C_v	Port Size	Valve Model Number*	Weight lb. (kg)
1	1.0	1/4-3/8	W6556A2417	0.8 (0.4)
2	2.3	3/8-1/2	W6556A3417	1.5 (0.7)
3	3.4	1/2-3/4	W6556A4417	3.0 (1.4)

*See pages 26-28 for accessories. Valve dimensions shown below.

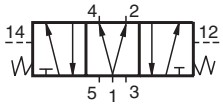


5/3 Valves – Double Remote Pressure Control

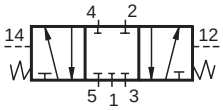


ISO Size	Avg. C_v	Port Size	Valve Model Number* Power Center	Closed Center	Open Center	Weight lb. (kg)
1	1.0	1/4-3/8	—	W6557A2411	W6557A2417	1.0 (0.5)
2	2.3	3/8-1/2	W6557A3901	W6557A3411	W6557A3417	1.5 (0.7)
3	3.4	1/2-3/4	W6557A4900	W6557A4411	W6557A4417	3.0 (1.4)

*See pages 26-28 for accessories. Valve dimensions shown below.



POWER CENTER



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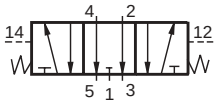


OPEN CENTER

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)

IMPORTANT NOTE
Please read carefully and thoroughly all of the **CAUTIONS** on page 89.

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).

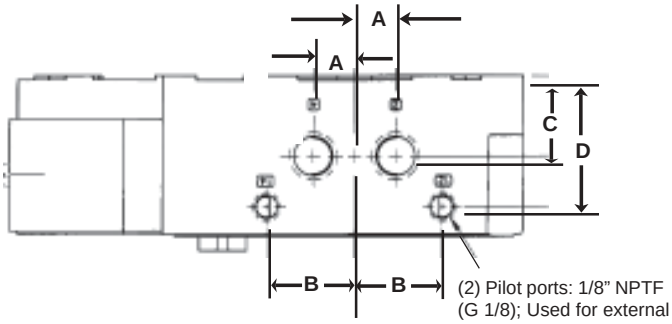
Bases for W65 ISO Valves (5599/II)

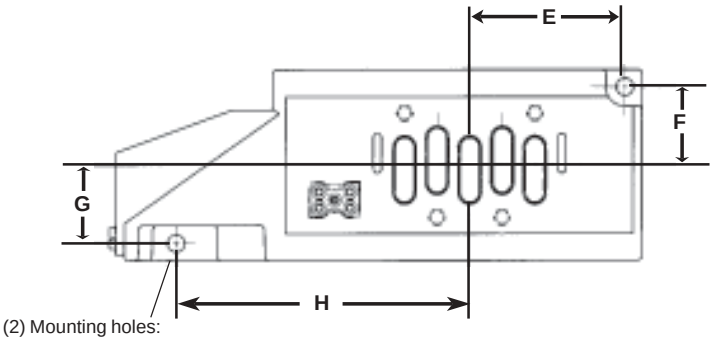
Side and Bottom-Ported Bases

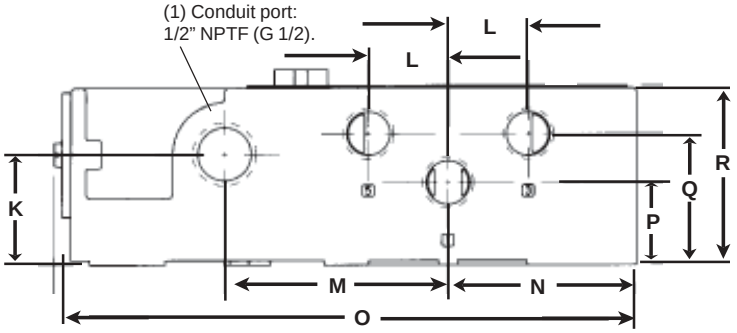
ISO Size	Port Size	Base Station Model Number
ISO 1	1/4 NPTF Side	949N91
	1/4 NPTF Side/Bottom	971N91
	3/8 NPTF Side	950N91
	3/8 NPTF Side/Bottom	972N91
	G 1/4 Side	D949N91
	G 3/8 Side	D950N91
ISO 2	3/8 NPTF Side	951N91
	3/8 NPTF Side/Bottom	952N91
	1/2 NPTF Side	953N91
	1/2 NPTF Side/Bottom	954N91
	G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

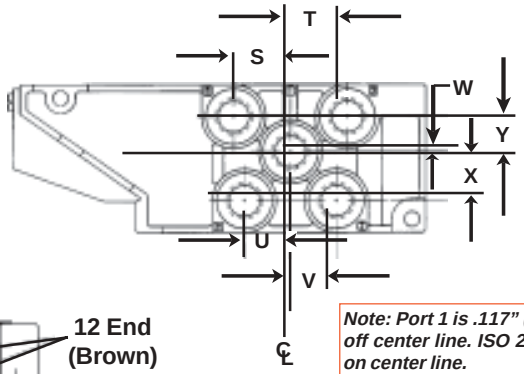
Base Dimensions inches (mm)

	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)

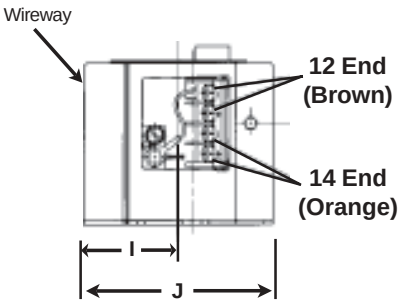








Note: Port 1 is .117" (3 mm) off center line. ISO 2, 3 fall on center line.



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

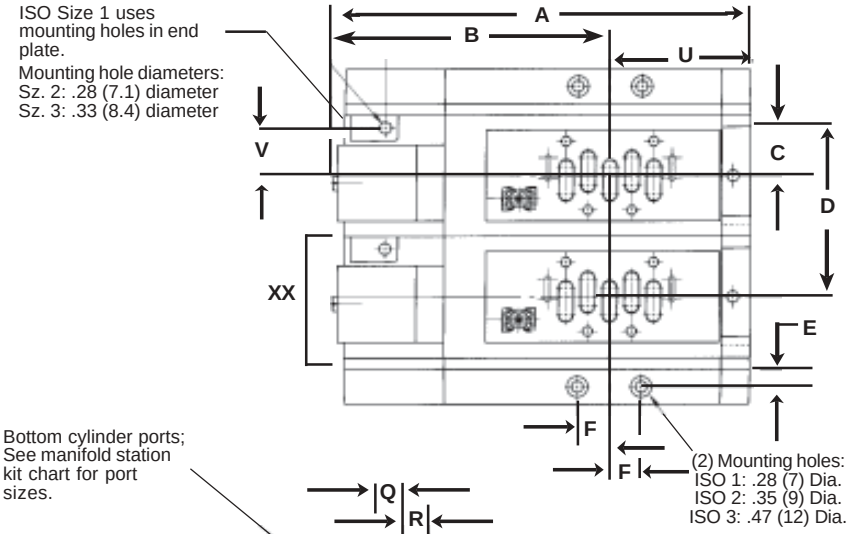
Series	Port Size	Part No.
ISO 1	3/8" NPTF	493N86
	G 3/8	D493N86
ISO 2	1/2" NPTF	494N86
	G 1/2	D494N86
ISO 3	1" NPTF	495N86
	G 1	D495N86

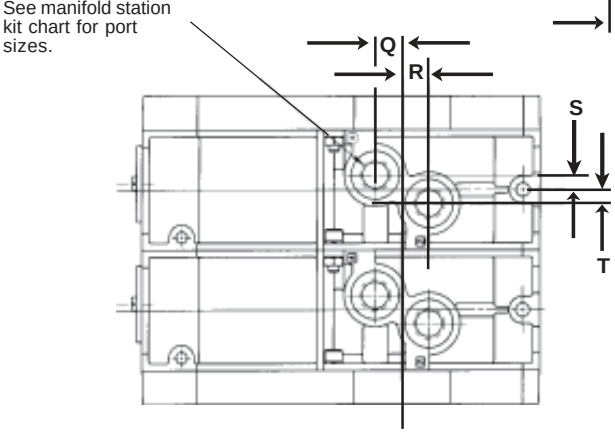
* Each end station kit includes left and right end plates, socket head screws, nuts and seals.

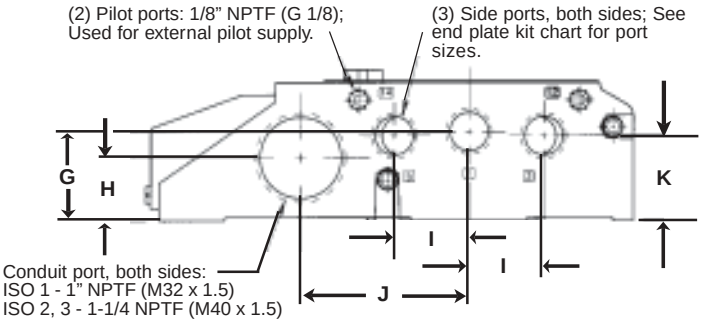
Manifold Station Assembly Numbers

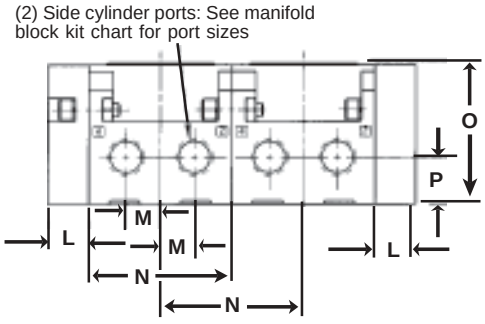
Series	Port Size	Part No.
ISO 1	1/4" NPTF End/Bottom	959N91
	3/8" NPTF End/Bottom	960N91
	G 1/4 End/Bottom	D959N91
	G 3/8 End/Bottom	D960N91
ISO 2	3/8" NPTF End/Bottom	961N91
	1/2" NPTF End/Bottom	962N91
	G 3/8 End/Bottom	D961N91
	G 1/2 End/Bottom	D962N91
ISO 3	1/2" NPTF End/Bottom	963N91
	3/4" NPTF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

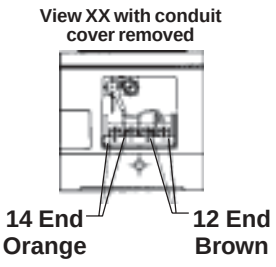
* Each Manifold Station Assembly includes a manifold assembly, socket head screws, nuts and seals.







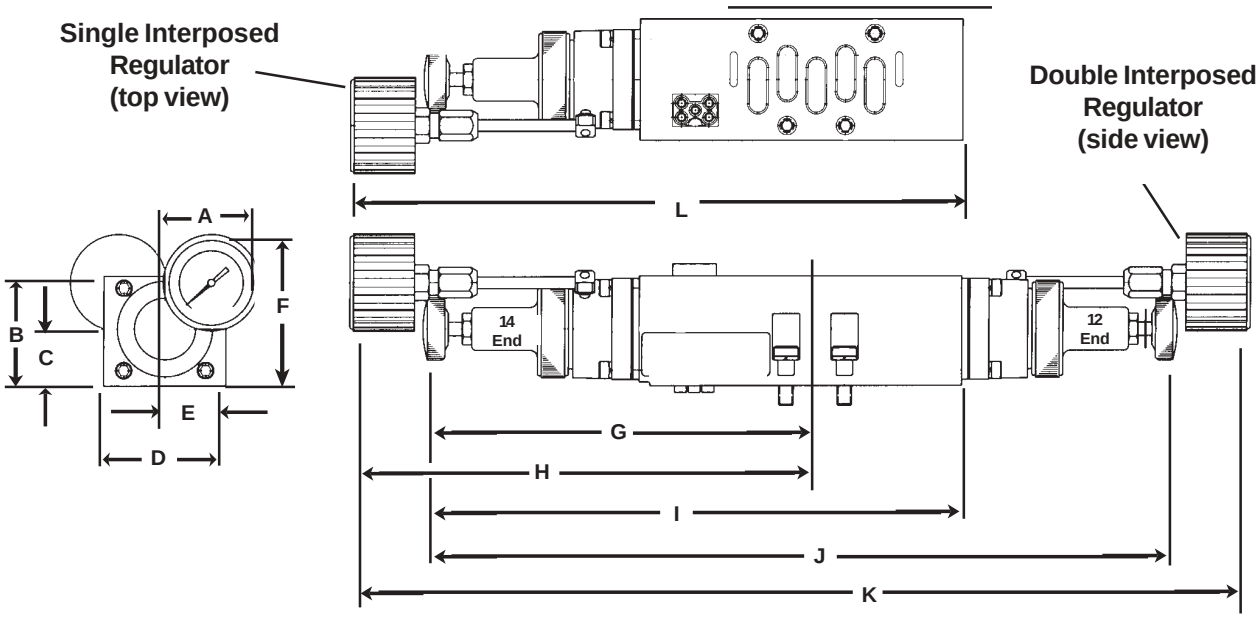




Accessories for Series 65 ISO Valves (5599/II)

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 an interposed regulator for a Series 65 double solenoid valve, the valve **must be externally piloted**.



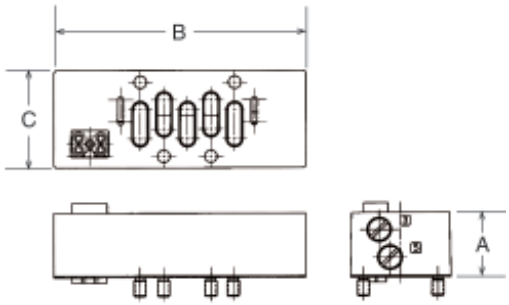
ISO Size	Part Number	A	B	C	D	E	F	G	H	I	J	K	L
1 (Sgl.)	965N91	1.6 (39)	1.8 (45)	0.9 (23)	1.7 (43)	0.9 (22)	2.5 (63)	6.2 (157)	7.2 (182)	8.0 (204)	11.6 (295)	13.6 (345)	9.0 (229)
1 (Dbl.)	966N91	1.6 (39)	1.8 (45)	0.9 (23)	1.7 (43)	0.9 (22)	2.5 (63)	6.2 (157)	7.2 (182)	8.0 (204)	11.6 (295)	13.6 (345)	9.0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

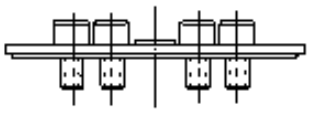
To bank different manifold sizes together.

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

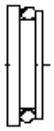
Pilot Port Blocking Plug

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.

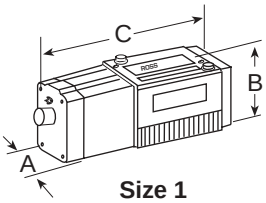


ISO Size	Part Number
1	1376N77
2	1378N77
3	1380N77

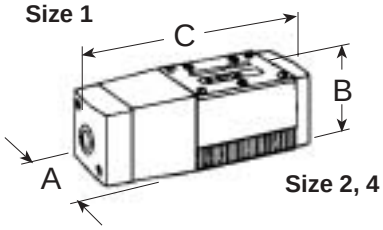
Notes

W70 Spool & Sleeve Valves for ANSI-type Bases

5/2 Valves – Single Direct Solenoid Spring Return



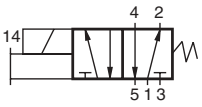
Size 1



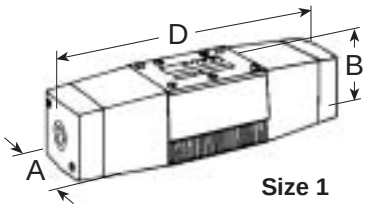
Size 2, 4

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	W7016B4331	4.3 (1.9)

* Base not included. See pages 35-37 for accessories.



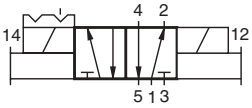
5/2 Valves – Double Direct Solenoid Momentary Control



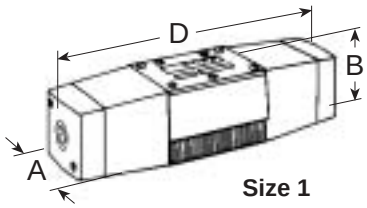
Size 1

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	W7016B4332	5.8 (2.6)

* Base not included. See pages 35-37 for accessories.



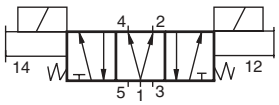
5/3 Valves – Double Direct Solenoid



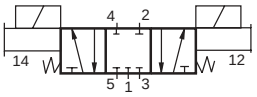
Size 1

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	—	W7017B4331	W7017B4332	5.8 (2.6)

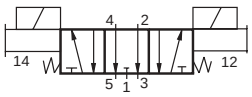
* Base not included. See pages 35-37 for accessories.



POWER CENTER



CLOSED CENTER



OPEN CENTER

IMPORTANT NOTE
Please read carefully and thoroughly all of the **CAUTIONS** on page 89.

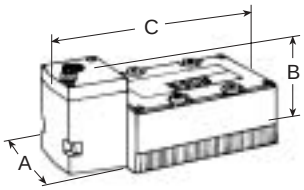
OVERALL DIMENSIONS inches (mm)

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)

STANDARD SPECIFICATIONS: For valves on this page.
Solenoids: AC power; DC for Cv= 1.0 models only.
See page 3 for voltages.
Power Consumption: Each solenoid.
Cv= 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: 40º to 175º F (4º to 80ºC).
Media Temperature: 40º to 175º F (4º to 80º C).
Flow Media: Filtered air. 5 micron recommended.
Inlet Pressure: Vacuum to 150 psig (10 bar).

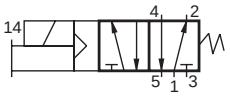
W70 Spool & Sleeve Valves for ANSI-type Bases

5/2 Valves – Single Solenoid Pilot Spring Return

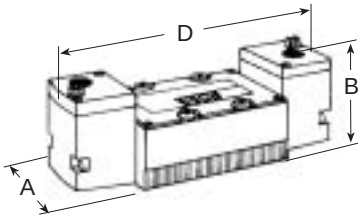


Size	Range of Port Sizes	Avg. C_v	Valve Model Numbers*	Weight lb. (kg)
1.0	1/4 - 3/8	1.0	W7076A2331	3.0 (1.4)
2.5	3/8 - 1/2	2.5	W7076A3331	3.0 (1.4)
4	3/8 - 3/4	4.2	W7076C4331	5.3 (2.4)
10	3/4 - 1-1/4	10	W7076C6331	7.3 (3.3)
20	1-1/4 - 1-1/2	22	W7076C8331	14.5 (6.5)

* Base not included. See pages 35-37 for accessories.

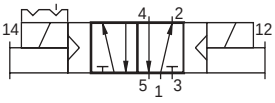


5/2 Valves – Double Solenoid Pilot Momentary Control

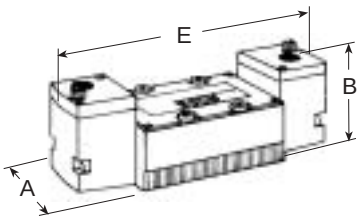


Size	Range of Port Sizes	Avg. C_v	Valve Model Numbers*	Weight lb. (kg)
1.0	1/4 - 3/8	1.0	W7076A2332	4.0 (1.8)
2.5	3/8 - 1/2	2.5	W7076A3332	4.0 (1.8)
4	3/8 - 3/4	4.2	W7076C4332	6.5 (2.9)
10	3/4 - 1-1/4	10	W7076C6332	9.0 (4.1)
20	1-1/4 - 1-1/2	22	W7076C8332	15.8 (6.8)

* Base not included. See pages 35-37 for accessories.

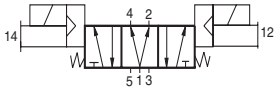


5/3 Valves – Double Solenoid Pilot

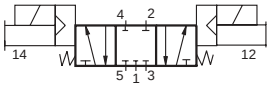


Size	Range of Port Sizes	Avg. C_v	Valve Model Numbers* Power Center	Closed Center	Open Center	Weight lb. (kg)
1.0	1/4 - 3/8	1.0	W7077A2906	W7077A2331	W7077A2332	4.0 (1.8)
2.5	3/8 - 1/2	2.5	W7077A3904	W7077A3331	W7077A3332	4.0 (1.8)
4	3/8 - 3/4	4.2	W7077B4939	W7077C4331	W7077C4332	6.5 (2.9)
10	3/4 - 1-1/4	10	W7077A6920	W7077C6331	W7077C6332	8.5 (3.8)
20	1-1/4 - 1-1/2	22	W7077A8901	W7077C8331	W7077C8332	15.3 (6.9)

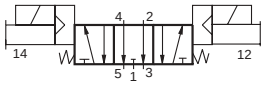
* Base not included. See pages 35-37 for accessories.



POWER CENTER



CLOSED CENTER



OPEN CENTER

IMPORTANT NOTE
Please read carefully and thoroughly all of the **CAUTIONS** on page 89.

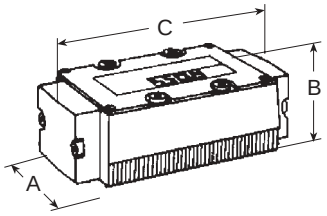
OVERALL DIMENSIONS inches (mm)

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)

STANDARD SPECIFICATIONS: For valves on this page.
Solenoids: AC or DC power. See page 3 for voltages.
Power Consumption: Each solenoid.
Cv= 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: Cv= 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:
Cv= 1.0 and 22 models: At least 30 psig (2 bar).
Cv= 2.5, 4.2, 10 models: At least 15 psig (1 bar).

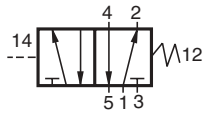
W70 Spool & Sleeve Valves for ANSI-type Bases

5/2 Valves – Single Pressure Control Spring Return

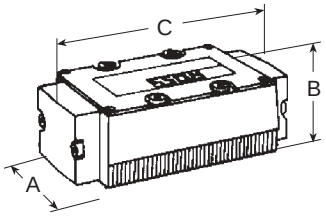


Size	Range of Port Sizes	Avg. C_v	Valve Model Numbers*	Weight lb. kg)
1.0	1/4 - 3/8	1.0	W7056A2331	2.5 (1.1)
2.5	3/8 - 1/2	2.5	W7056A3331	2.0 (0.9)
4	3/8 - 3/4	4.2	W7056A4331	4.3 (1.9)
10	3/4 - 1-1/4	10	W7056A6331	6.3 (2.8)
20	1-1/4 - 1-1/2	22	W7056A8331	13.0 (5.9)

* Base not included. See pages 35-37 for accessories.

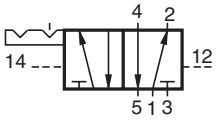


5/2 Valves – Double Pressure Control Momentary Control

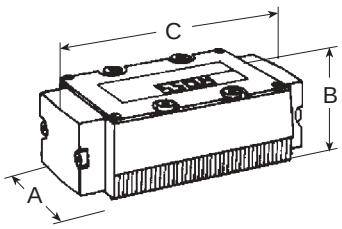


Size	Range of Port Sizes	Avg. C_v	Valve Model Numbers*	Weight lb. (kg)
1.0	1/4 - 3/8	1.0	W7056A2332	2.5 (1.1)
2.5	3/8 - 1/2	2.5	W7056A3332	2.0 (0.9)
4	3/8 - 3/4	4.2	W7056A4332	4.3 (1.9)
10	3/4 - 1-1/4	10	W7056A6332	6.3 (2.8)
20	1-1/4 - 1-1/2	22	W7056A8332	13.8 (6.2)

* Base not included. See pages 35-37 for accessories.

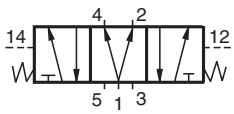


5/3 Valves – Double Pressure Control

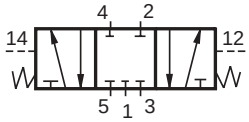


Size	Range of Port Sizes	Avg. C_v	Valve Model Numbers* Power Center	Closed Center	Open Center	Weight lb. (kg)
1.0	1/4 - 3/8	1.0	—	W7057A2331	W7057A2332	2.5 (1.1)
2.5	3/8 - 1/2	2.5	—	W7057A3331	W7057A3332	2.0 (0.9)
4	3/8 - 3/4	4.2	—	W7057A4331	W7057A4332	4.5 (2.0)
10	3/4 - 1-1/4	10	W7057A6902	W7057A6331	W7057A6332	6.3 (2.8)
20	1-1/4 - 1-1/2	22	—	W7057A8331	W7057A8332	13.8 (6.2)

* Base not included. See pages 35-37 for accessories.



POWER CENTER



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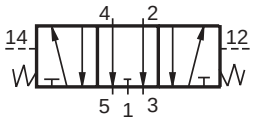


OPEN CENTER

IMPORTANT NOTE
Please read carefully and thoroughly all of the **CAUTIONS** on page 89.

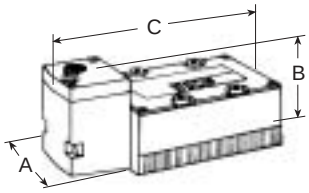
OVERALL DIMENSIONS inches (mm)

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)

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

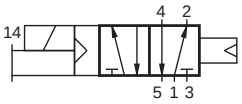
W74 Poppet Valves for ANSI-type Bases

5/2 Valves – Single Solenoid Pilot Air Return

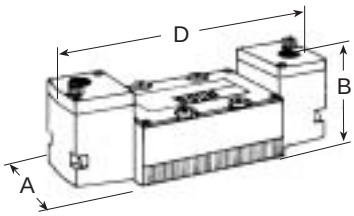


Size	Range of Port Sizes	Avg. C_V	Valve Model Numbers* Std. Temp.	High Temp.	Weight lb. (kg)
1.0	1/4 – 3/8	0.9	W7476A2331	W7476A2336	3.0 (1.4)
2.5	3/8 – 1/2	2.0	W7476A3331	W7476A3336	3.0 (1.4)
4	3/8 – 3/4	4.2	W7476B4331	W7476B4336	5.0 (2.3)
10	3/4 – 1-1/4	11	W7476A6331	W7476A6336	6.1 (2.8)
20	1-1/4 – 1-1/2	22	W7476A8331	W7476A8336	18.5 (8.3)

*Base not included. See pages 35-37 for accessories.

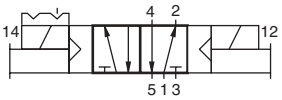


5/2 Valves – Double Solenoid Pilot Momentary Control



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	W7476B4332	W7476B4337	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 35-37 for accessories.



IMPORTANT NOTE
Please read carefully and thoroughly all of the **CAUTIONS** on page 89.

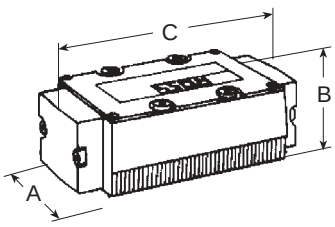
OVERALL DIMENSIONS inches (mm)

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)

STANDARD SPECIFICATIONS: For valves on this page.
Solenoids: AC or DC power. See page 3 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.

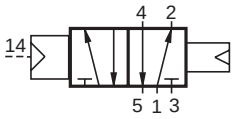
W74 Poppet Valves for ANSI-type Bases

5/2 Valves – Single Pressure Control Air Return

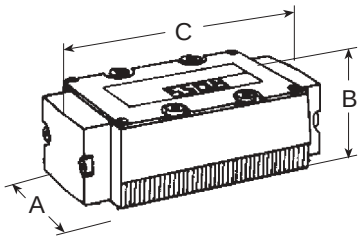


Size	Range of Port Sizes	Avg. C_v	Valve Model Numbers* Std. Temp.	High Temp.	Weight lb. (kg)
1.0	1/4 – 3/8	0.9	W7456A2331	W7456A2336	2.5 (1.1)
2.5	3/8 – 1/2	2.0	W7456A3331	W7456A3336	2.0 (0.9)
4	3/8 – 3/4	4.2	W7456B4331	W7456B4336	3.3 (1.5)
10	3/4 – 1-1/4	11	W7456A6331	W7456A6336	7.3 (3.3)
20	1-1/4 – 1-1/2	22	W7456A8331	W7456A8336	17.5 (7.9)

*Base not included. See pages 35-37 for accessories.

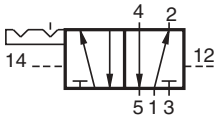


5/2 Valves – Double Pressure Control Momentary Control



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	W7456B4332	W7456B4337	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 35-37 for accessories.



IMPORTANT NOTE
Please read carefully and thoroughly all of the **CAUTIONS** on page 89.

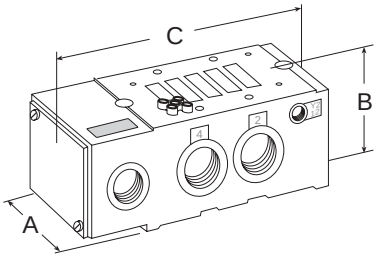
OVERALL DIMENSIONS inches (mm)

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)

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.

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 3.



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**	—	—			

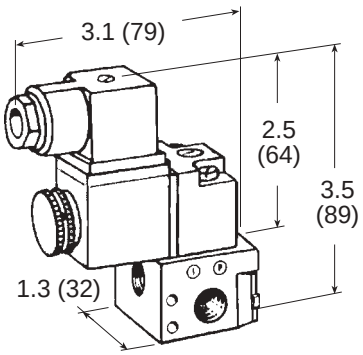
3/2 Miniature Valves for Base Mounting

VALVE MODEL NUMBERS

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

BASES: 1/8 NPT ports. See page 3 for other threads.

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



Valve is shown with electrical connector and on a base. See page 21 for electrical connector. See bases at left.

STANDARD SPECIFICATIONS

C_V Rating: 0.1
Solenoids: AC or DC power. See page 3 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.

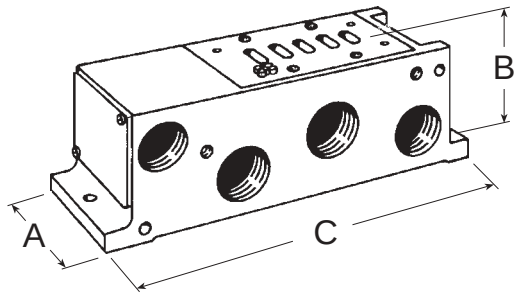
ANSI-type Manifolds

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 4.

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. See page 3 for voltages.

IMPORTANT NOTE
Please read carefully and thoroughly all of the **CAUTIONS** on page 89.

ASSEMBLED MANIFOLDS

Valves and manifold stations can be assembled by ROSS to your 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.

Accessories for ANSI-type Valves

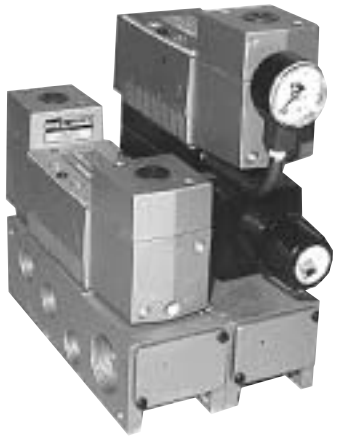
Interposed Pressure Regulators

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.

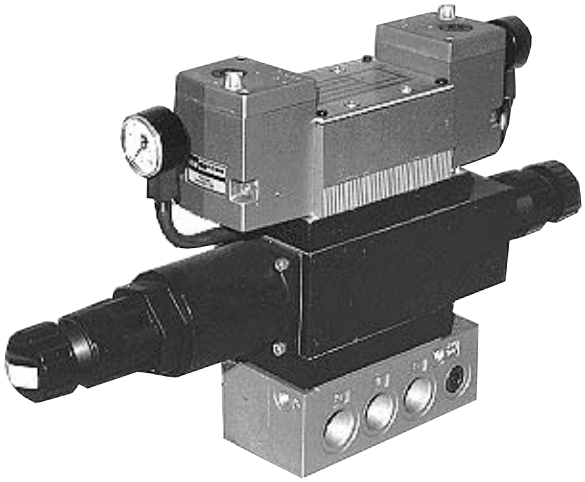
A locking type knob is used to set the regulated pressure at any point in the range of 5 to 100 psig (0.3 to 7 bar) for $C_v = 0.9$ to 2.5 models; 5 to 125 psig (0.3 to 8.5 bar) for $C_v = 4.2$ models. Maximum inlet pressure is 150 psig (10 bar). Pressure gauge(s) included. Order regulators by the part numbers shown at the right.

	Single	Double * Solenoid	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.



Valve with single interposed regulator shown on manifold along with double solenoid valve.



Valve with double interposed regulator.

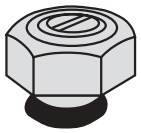
Manual Override Kits for Solenoid Pilot Valves

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.

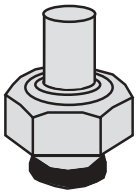
Each of the override buttons in the kits at the right is made of metal and is spring-returned. The locking type button, however, can be kept in the actuated position by turning the slot in the top of the button with a screwdriver.

Order by the kit numbers shown at the right.

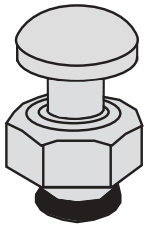
FLUSH BUTTON
Locking type ..... **Kit 792K87**
Non-locking type ..... **Kit 790K87**



EXTENDED BUTTON
Non-locking type
Kit 791K87

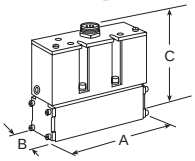


EXTENDED BUTTON WITH PALM ACTUATOR
Non-locking type
Kit 984H87

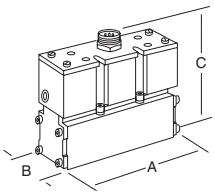


Series 80 Spool & Sleeve Valves for SAE Bases

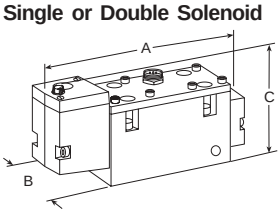
5/2 Spool Valves



Series 125
Single or Double Solenoid



Series 250
Single or Double Solenoid



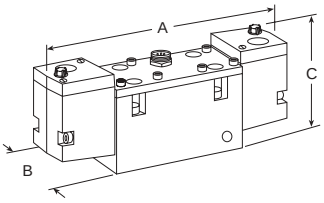
Series 500
Single Solenoid

Valve Model Numbers (Base not included)

SINGLE SOLENOID PILOT VALVES

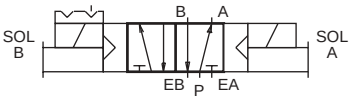
SAE Series	Type of Wiring Ford	Chrysler	Hardwire	Dimensions inches (mm) A	B	C	Weight lb. (kg)
125	8076B3331	8076B3341	8076B3351	5.5 (140)	1.8 (45)	5.1 (129)	3.5 (1.6)
250	8076B4331	8076B4341	8076B4351	6.4 (160)	2.6 (65)	5.6 (142)	6.5 (2.9)
500	8076B6331	8076B6341	8076B6351	10.1 (257)	3.0 (76)	4.8 (121)	8.3 (3.7)
DOUBLE SOLENOID PILOT VALVES							
125	8076B3332	8076B3342	8076B3352	5.5 (140)	1.8 (45)	5.1 (129)	3.5 (1.6)
250	8076B4332	8076B4342	8076B4352	7.3 (185)	2.6 (65)	5.6 (142)	7.0 (3.2)
500	8076B6332	8076B6342	8076B6352	11.2 (285)	3.0 (76)	4.8 (121)	9.5 (4.3)

*C_V ratings on page 39. Bases and manifolds on pages 40-41.



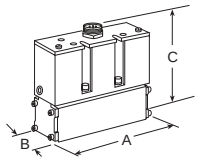
Series 500
Double Solenoid

SINGLE SOLENOID

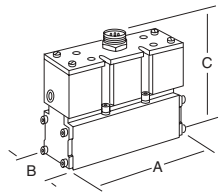


DOUBLE SOLENOID

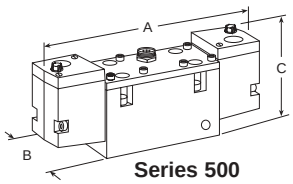
5/3 Spool Valves



Series 125



Series 250



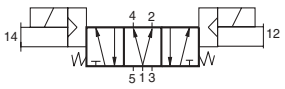
Series 500
Double Solenoid

Valve Model Numbers (Base not included)

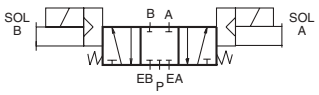
POWER CENTER SOLENOID PILOT VALVES

SAE Series	Type of Wiring Ford	Chrysler	Hardwire	Dimensions inches (mm) A	B	C	Weight lb. (kg)
125	8077A3910	8077A3904	—	5.5 (140)	1.8 (45)	5.1 (129)	3.5 (1.6)
250	8077A4907	8077A4904	—	7.3 (185)	2.6 (65)	5.6 (142)	7.0 (3.2)
OPEN CENTER SOLENOID PILOT VALVES							
125	8077B3332	8077B3342	8077B3352	5.5 (140)	1.8 (45)	5.1 (129)	3.5 (1.6)
250	8077B4332	8077B4342	8077B4352	7.3 (185)	2.6 (65)	5.6 (142)	7.0 (3.2)
500	8077B6332	8077B6342	8077B6352	12.0 (306)	3.0(76)	4.8 (121)	9.5 (4.3)
CLOSED CENTER SOLENOID PILOT VALVES							
125	8077B3331	8077B3341	8077B3351	5.5 (140)	1.8 (45)	5.1 (129)	3.5 (1.6)
250	8077B4331	8077B4341	8077B4351	7.3 (185)	2.6 (65)	5.6 (142)	7.0 (3.2)
500	8077B6331	8077B6341	8077B6351	12.0 (306)	3.0(76)	4.8 (121)	9.5 (4.3)

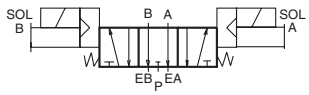
*C_V ratings on page 39. Bases and manifolds on pages 40-41.



POWER CENTER



CLOSED CENTER

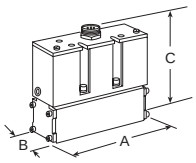


OPEN CENTER

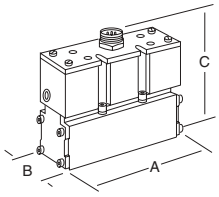
IMPORTANT NOTE
Please read carefully and thoroughly all of the **CAUTIONS** on page 89.

STANDARD SPECIFICATIONS: Rated for continuous duty.
Series 125, 250: 100-110 volts, 50 Hz; 100-120 volts, 60 Hz; 24, 110 volts d.c.
Series 500: 100-110 volts, 50 Hz; 100-120 volts, 60 Hz; 24, 110 volts d.c.
Power Consumption: Each solenoid:
Series 125, 250: 8 VA inrush; 6 VA holding on 50/60 Hz 8 watts on d.c.
Series 500: 87 VA inrush; 30 VA holding on 50/60 Hz 14 watts on d.c.
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.

Series 84 Poppet Valves



Series 125
Single or Double Solenoid

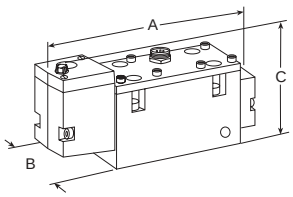


Series 250
Single or Double Solenoid

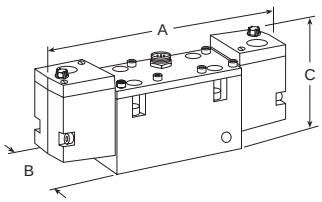
Valve Model Numbers (Base not included)
SINGLE SOLENOID PILOT VALVES

SAE Series	Type of Wiring Ford	Chrysler	Hardwire	Dimensions inches (mm) A	B	C	Weight lb. (kg)
125	8476B3331	8476B3341	8476B3352	15.5 (140)	1.8 (45)	5.1 (129)	2.8 (1.3)
250	8476B4331	8476B4341	8476B4352	17.3 (185)	2.6 (65)	5.6 (142)	5.3 (2.4)
500	8476B6331	8476B6341	8476B6352	10.1(257)	3.0 (76)	4.8 (121)	7.8 (3.5)
DOUBLE SOLENOID PILOT VALVES							
125	8476B3332	8476B3342	8476B3352	5.5 (140)	1.8 (45)	5.1 (129)	3.0 (1.4)
250	8476B4332	8476B4342	8476B4352	7.3 (185)	2.6 (65)	5.6 (142)	5.8 (2.6)
500	8476B6332	8476B6342	8476B6352	11.2 (285)	3.0 (76)	7.1 (180)	9.0 (4.1)

*C_V ratings below. Bases and manifolds on pages 40-41. Interposed devices are also available, for more information, refer to Bulletin 376D (ROSS form number A10084).



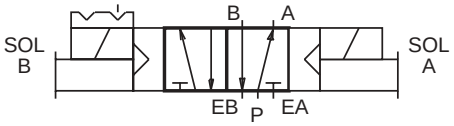
Series 500
Single Solenoid



Series 500
Double Solenoid

Average C_V Ratings			
	Automotive Series		
Valve Type	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.

IMPORTANT NOTE
Please read carefully and thoroughly all of the **CAUTIONS** on page 89.

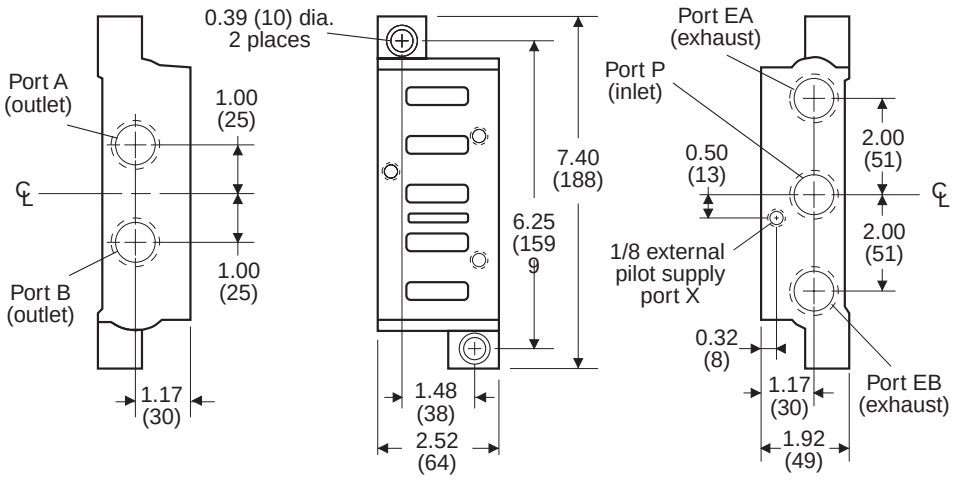
STANDARD SPECIFICATIONS: Rated for continuous duty.
Series 125, 250: 100-110 volts, 50 Hz; 100-120 volts, 60 Hz; 24, 110 volts d.c.
Series 500: 100-110 volts, 50 Hz; 100-120 volts, 60 Hz; 24, 110 volts d.c.
Power Consumption: Each solenoid:
Series 125, 250: 8 VA inrush; 6 VA holding on 50/60 Hz 8 watts on d.c.
Series 500: 87 VA inrush; 30 VA holding on 50/60 Hz 14 watts on d.c.
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.

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.		

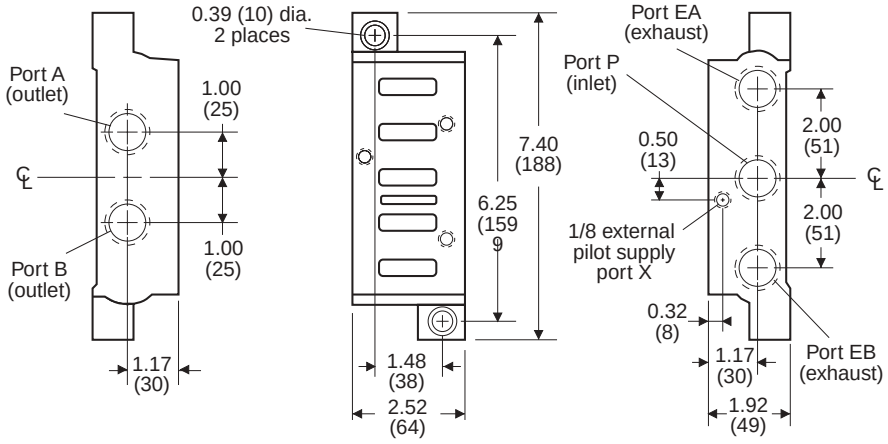
Dimensions: inches (mm).



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.		

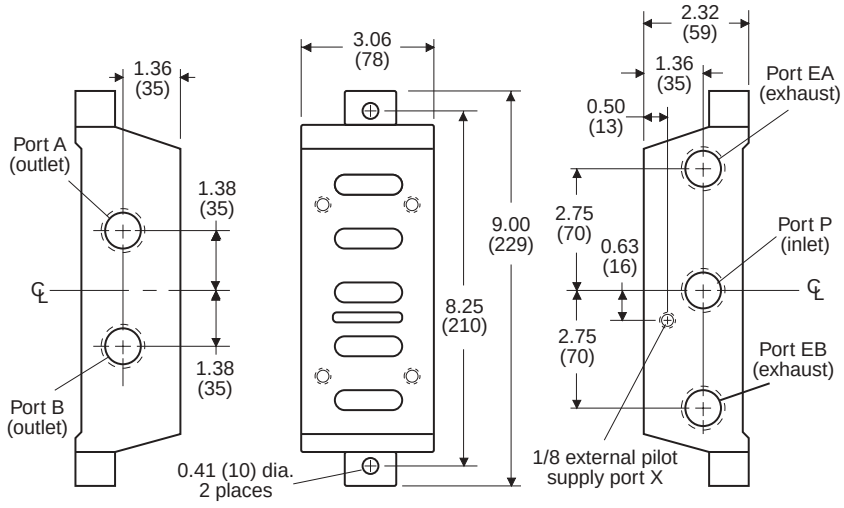
Dimensions: inches (mm).



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.		

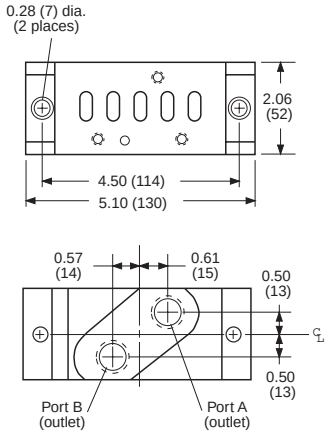
Dimensions: inches (mm).

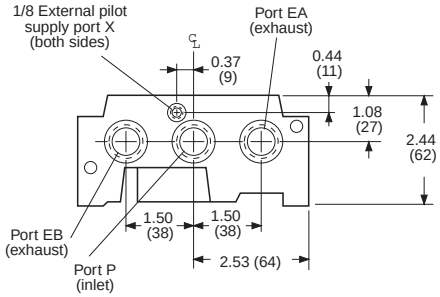


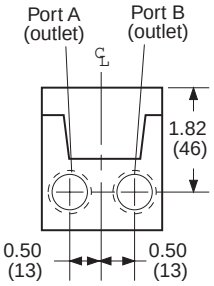
Manifolds for 80 & 84 Series SAE Valves

Series 125 Manifold Stations

Dimensions: inches (mm)



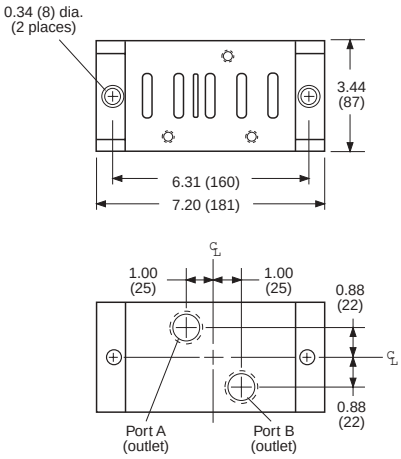


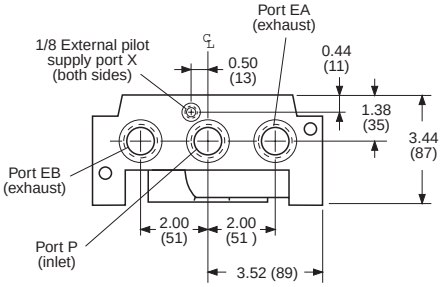


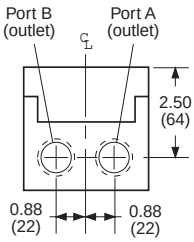
Blanking Plate- For manifold stations not occupied by a valve, blanking plates are available. These plates block the unused air passages. Order by part number **820K77.**

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



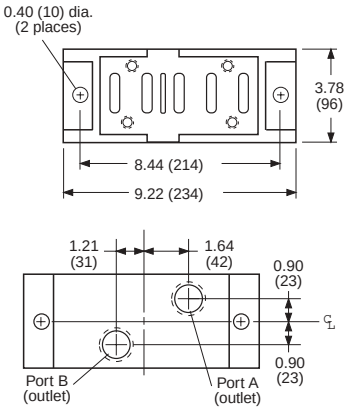


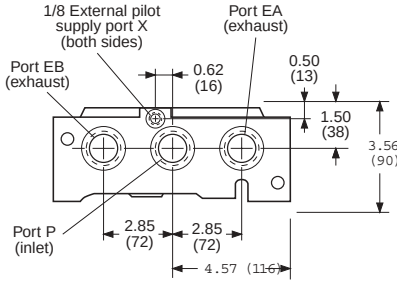


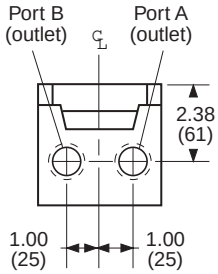
Blanking Plate- For manifold stations not occupied by a valve, blanking plates are available. These plates block the unused air passages. Order by part number **821K77.**

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.

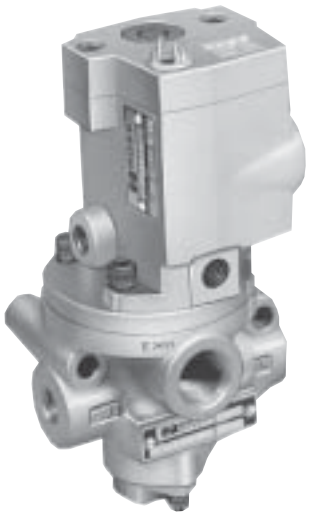
To provide special control functions, most models are also available with the following **LOGICAIR®** adaptors.

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.

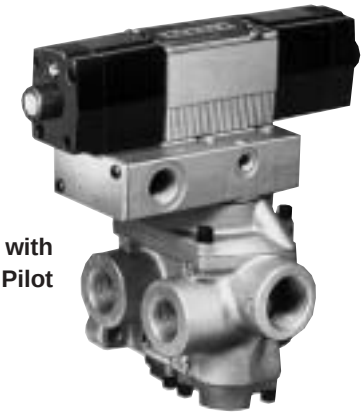
"PB" Adaptor: Increases the actuating force on the valve piston. Useful with low pilot pressure.

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.

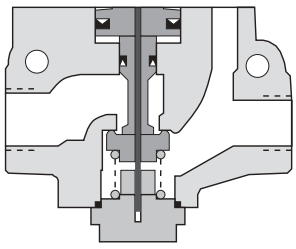


3/2 Valve with Single Solenoid Pilot

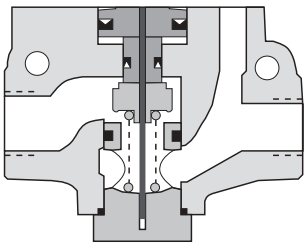


4/2 Valve with Double Solenoid Pilot

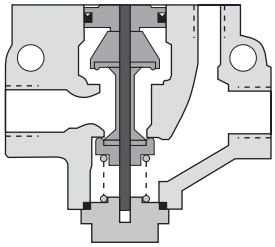
Series 27 Valve Bodies



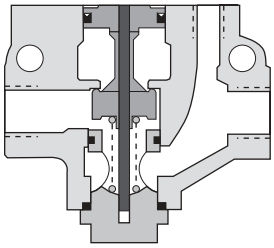
2/2 Normally Closed



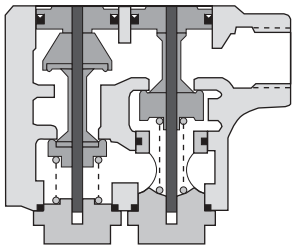
2/2 Normally Open



3/2 Normally Closed



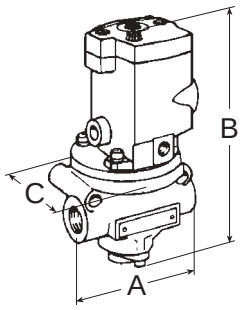
3/2 Normally Open



4/2

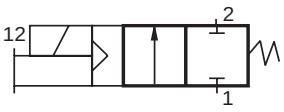
Series 27 Single Solenoid Pilot Inline Valves

2/2 Valves

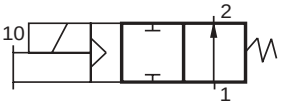


Port Size	Valve Model Numbers Normally Closed	Normally Open	Average C_v N.C.	N.O.	Weight lb. (kg)
1/4	2771B2001	2772B2001	2.3	2.3	2.5 (1.1)
3/8	2771B3001	2772B3001	3.8	3.3	
1/2	2771B4011	2772B4011	4.0	3.5	
1/2	2771B4001	2772B4001	7.7	6.5	3.3 (1.5)
3/4	2771B5001	2772B5001	9.0	7.3	
1	2771B6011	2772B6011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

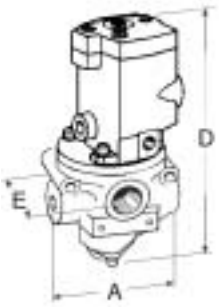
Normally Closed



Normally Open

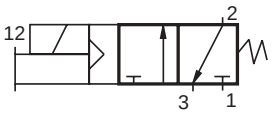


3/2 Valves

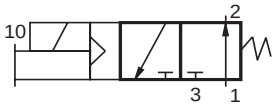


Port Sizes In-Out	Exh.	Valve Model Numbers Normally Closed	Normally Open	Average C_v N.C.	N.O.	Weight lb. (kg)
1/4	1/2	2773B2001	2774B2001	2.8	2.5	2.5 (1.1)
3/8	1/2	2773B3001	2774B3001	4.0	3.0	
1/2	1/2	2773B4011	2774B4011	3.8	3.0	
1/2	1	2773B4001	2774B4001	7.8	7.2	3.3 (1.5)
3/4	1	2773B5001	2774B5001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

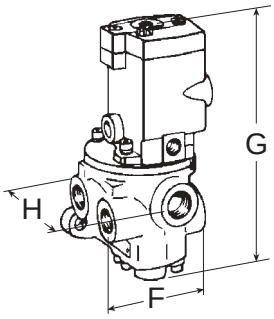
Normally Closed



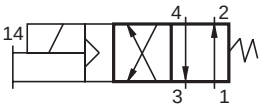
Normally Open



4/2 Valves



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



IMPORTANT NOTE
Please read carefully and thoroughly all of the **CAUTIONS** on page 89.

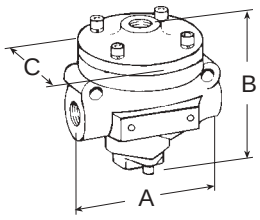
OVERALL DIMENSIONS inches (mm)

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)	—	—	—

STANDARD SPECIFICATIONS: For valves on this page.
Solenoids: AC or DC power. See page 3 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 3.

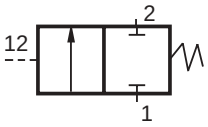
Series 27 Remote Air Pilot Inline Valves

2/2 Valves

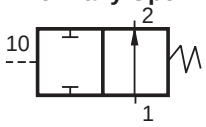


Port Size	Valve Model Numbers Normally Closed	Normally Open	Average C_v N.C.	N.O.	Weight lb. (kg)
1/4	2751A2001	2752A2001	2.3	2.3	
3/8	2751A3001	2752A3001	3.8	3.3	1.3 (0.6)
1/2	2751A4011	2752A4011	4.0	3.5	
1/2	2751A4001	2752A4001	7.7	6.5	
3/4	2751A5001	2752A5001	9.0	7.3	2.0 (0.9)
1	2751A6011	2752A6011	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	

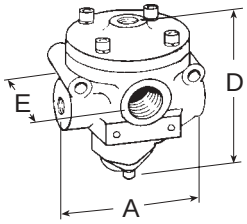
Normally Closed



Normally Open

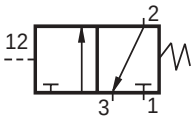


3/2 Valves

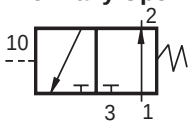


Port Sizes In-Out	Exh.	Valve Model Numbers Normally Closed	Normally Open	Average C_v N.C.	N.O.	Weight lb. (kg)
1/4	1/2	2753A2001	2754A2001	2.8	2.5	
3/8	1/2	2753A3001	2754A3001	4.0	3.0	1.3 (0.6)
1/2	1/2	2753A4011	2754A4011	3.8	3.0	
1/2	1	2753A4001	2754A4001	7.8	7.2	
3/4	1	2753A5001	2754A5001	9.4	7.2	2.0 (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	

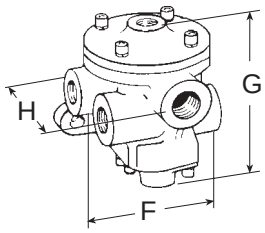
Normally Closed



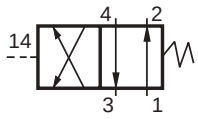
Normally Open



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	



IMPORTANT NOTE
Please read carefully and thoroughly all of the **CAUTIONS** on page 89.

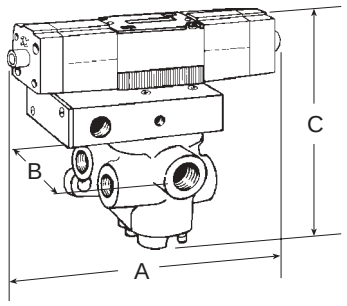
OVERALL DIMENSIONS inches (mm)

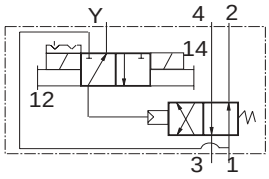
Port Size	A	B	C	D	E	F	G	H
1/4 to 1/2	3.6 (90)	3.7 (94)	3.0 (77)	4.0 (101)	3.1 (79)	3.9 (99)	4.0 (101)	3.9 (99)
1/2 to 1	4.6 (116)	4.4 (112)	3.0 (77)	4.7 (120)	3.6 (91)	4.6 (117)	5.8 (147)	5.3 (134)
1 to 1-1/2	6.6 (168)	7.4 (188)	4.1 (104)	7.4 (188)	4.8 (123)	6.5 (165)	7.5 (190)	8.3 (211)
1-1/2 to 2-1/2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

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 3.

Series 27 Double Solenoid Pilot Inline Valves

4/2 Valves





OVERALL DIMENSIONS inches (mm)

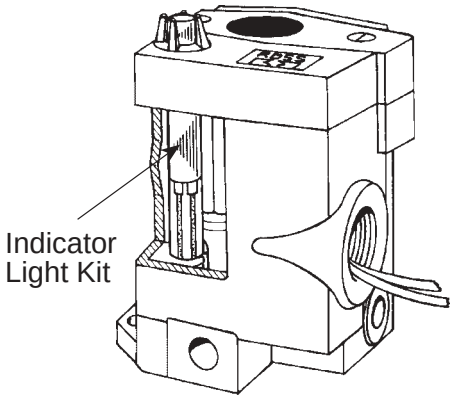
Port Size	A	B	C
1/4 to 1/2	9.4 (239)	3.9 (99)	7.9 (201)
1/2 to 1	9.4 (239)	5.3 (134)	9.7 (246)
1 to 1-1/2	9.4 (239)	8.2 (208)	11.6 (295)

IMPORTANT NOTE
Please read carefully and thoroughly all of the **CAUTIONS** on page 89.

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 3 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 3.

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.

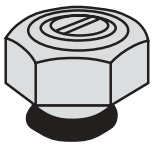
An indicator light is available in kit form for single solenoid models in Series 16, Series 21 (type O only), and Series 27. Order kit number **862K87** and specify the voltage of the solenoid.

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.

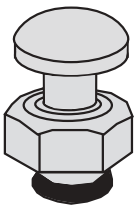
Each of the buttons in the override kits below is made of metal and is spring-returned. The locking type button, however, can be kept in the actuated position by turning the slot in the top of the button with a screwdriver.

Order by the kit numbers shown below.

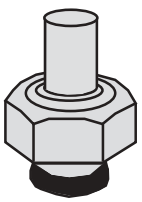


FLUSH BUTTON
Locking type ..... **Kit 792K87**
Non-locking type ..... **Kit 790K87**

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



EXTENDED BUTTON
Non-locking type
Kit 791K87



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.

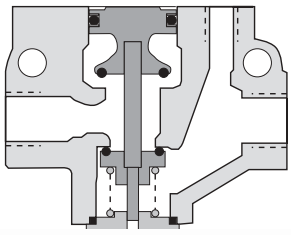
Solenoid models listed in this catalog use an internal pilot supply. They are, however, easily field-convertible for use with an external pilot supply. Models for external pilot supply may also be ordered from ROSS.

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.

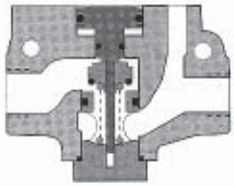
3/2 Valve with Single Solenoid Pilot - Metal override button on top of pilot is standard on all single solenoid models.



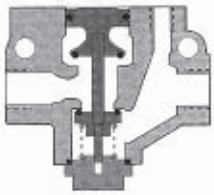
O-ring piston seals have Teflon® wear rings top and bottom. Inlet and exhaust poppets have spun-in O-ring seals.

Series 21 Valve Bodies

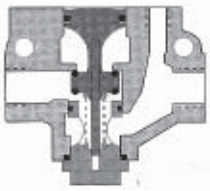
2-Way, Normally-Closed
1/4 to 1 1/2
Series 21H, 21O



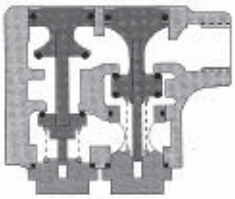
2-Way, Normally-Open
1/4 to 1 1/2
Series 21H, 21O



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

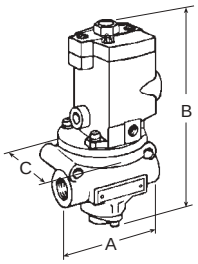


3-Way, Normally-Open
1/4 to 1 1/2
Series 21H, 21O



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

Series 21 Single Solenoid Pilot Inline Valves



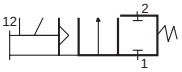
2/2 Valves

VALVE MODEL NUMBERS for TYPE H (High Temperature) SERVICE

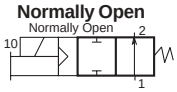
Port Size In-Out	Exh.	2/2 Valves Normally Closed	2/2 Valves Normally Open	3/2 Valves Normally Closed	3/2 Valves Normally Open	4/2 Valves	Weight lb. (kg)
1/4	1/2	2171B2001	2172B2001	2173B2001	2174B2001	2176B2001	
3/8	1/2	2171B3001	2172B3001	2173B3001	2174B3001	2176B3001	3.0 (1.4)
1/2	1/2	2171B4011	2172B4011	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	

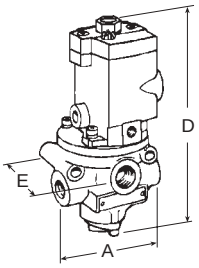
2-Way

Normally Closed



Normally Open

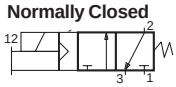




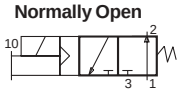
3/2 Valves

3-Way

Normally Closed



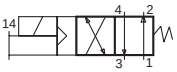
Normally Open

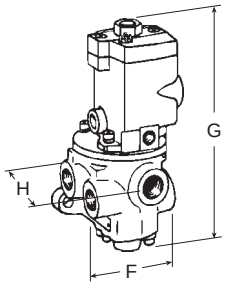


VALVE MODEL NUMBERS for TYPE O (Low Temperature) SERVICE

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-Way





4/2 Valves

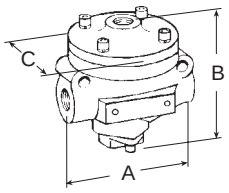
IMPORTANT NOTE
Please read carefully and thoroughly all of the **CAUTIONS** on page 89.

OVERALL DIMENSIONS inches (mm)

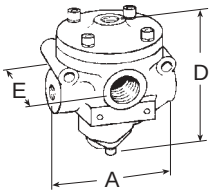
Port Size	A	B	C	D	E	F	G	H
1/4 to 1/2	3.6 (90)	7.0 (178)	3.0 (76)	7.3 (186)	3.6 (92)	3.8 (97)	7.7 (196)	3.9 (99)
1/2 to 1	4.6 (116)	7.7 (196)	3.0 (76)	8.0 (203)	4.6 (117)	5.2 (132)	9.7 (246)	4.6 (104)
1 to 1-1/2	6.6 (168)	10.5 (266)	4.1 (104)	10.5 (266)	6.6 (168)	8.2 (208)	11.1 (282)	6.5 (165)

STANDARD SPECIFICATIONS: For valves on this page.
Solenoids: AC or DC power. See page 3 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 3.
Average C_V: Ratings see corresponding Series 27 models on page 43.

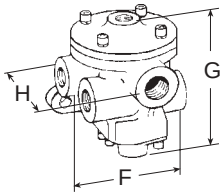
Series 21 Pressure Controlled Inline Valves



2/2 Valves



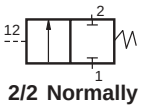
3/2 Valves



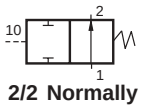
4/2 Valves

VALVE MODEL NUMBERS for TYPE H (High Temperature) SERVICE

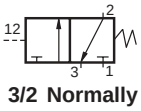
Port Size In-Out	Exh.	2/2 Valves Normally Closed	2/2 Valves Normally Open	3/2 Valves Normally Closed	3/2 Valves Normally Open	4/2 Valves	Weight lb. (kg)
1/4	1/2	2151B2001	2152B2001	2153B2001	2154B2001	2156B2001	
3/8	1/2	2151B3001	2152B3001	2153B3001	2154B3001	2156B3001	1.8 (0.8)
1/2	1/2	2151B4011	2152B4011	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	



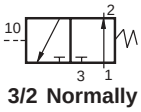
2/2 Normally Closed



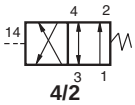
2/2 Normally Open



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	

IMPORTANT NOTE
Please read carefully and thoroughly all of the **CAUTIONS** on page 89.

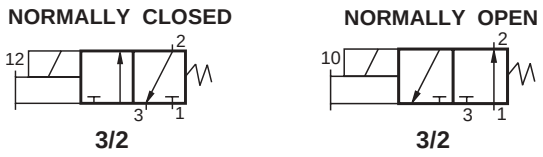
OVERALL DIMENSIONS inches (mm)

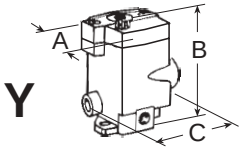
Port Size	A	B	C	D	E	F	G	H
1/4 to 1/2	3.6 (90)	3.7 (94)	3.0 (77)	4.0 (101)	3.1 (79)	3.9 (99)	4.0 (101)	3.9 (99)
1/2 to 1	4.6 (116)	4.4 (112)	3.0 (77)	4.7 (120)	3.6 (91)	4.6 (117)	5.8 (147)	5.3 (134)
1 to 1-1/2	6.6 (168)	7.5 (190)	4.1 (104)	7.5 (190)	4.8 (123)	6.5 (165)	7.5 (190)	8.3 (211)

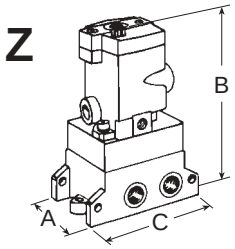
STANDARD SPECIFICATIONS: For valves on this page.
Ambient/Media Temperatures: *Type H:* 0° to 300°F (-17° to 150°C). *Type O:* -40° to 175°F (-40° to 80°C). *For temperatures below 40°F (4°C) air must be free of water vapor to prevent formation of ice.*
Flow Media: Filtered air. 5 micron recommended.
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 3.
For **Average C_v** ratings see corresponding Series 27 models on page 44.

Series 16 Compact Valves

3/2 Valves – Single Direct Solenoid



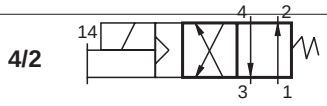




Port Size	Valve Type	Avg. C_V	Valve Model Numbers Normally Closed	Normally Open	Dimensions inches (mm) A	B	C	Weight lb. (kg)
1/8	Y	0.3	1613B1020	1614B1020	2.7 (69)	3.8 (95)	3.0 (77)	1.4 (0.6)
1/4	Y	0.3	1613B2020	1614B2020	2.7 (69)	3.8 (95)	3.0 (77)	1.4 (0.6)
1/4	Z	0.3	1613C2322*	1614B2322*	2.7 (69)	6.6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

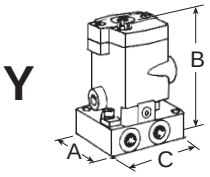
*Also order manifold 256B91 (not included with this valve).

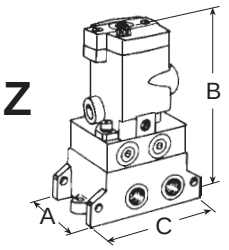
4/2 Valves – Single Solenoid Pilot



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).





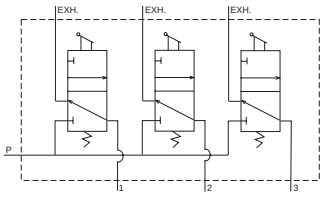
IMPORTANT NOTE
Please read carefully and thoroughly all of the **CAUTIONS** on page 89.

Series 16 OVERALL DIMENSIONS inches (mm)

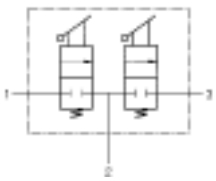
Valve Type	A	B	C
Y (3/2)	2.7 (69)	3.8 (95)	3.0 (77)
Y (4/2)	2.7 (69)	4.8 (121)	3.1 (78)
Z	2.63 (66.6)	6.6 (168)	4.2 (107)

STANDARD SPECIFICATIONS: *For Series 16 valves.*
Solenoids: AC or DC power. See page 3 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).

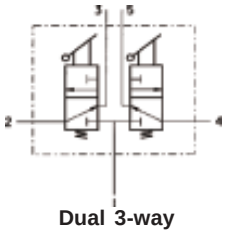
Pendant Control Valves



Triple 3-way



Dual 2-way



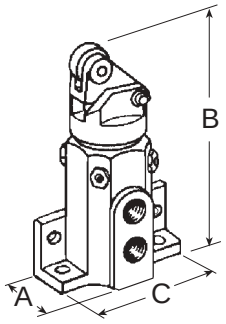
Dual 3-way

ROSS Pendant Control valves are a durable pneumatic solution that can be used anywhere you need manual control of devices 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.

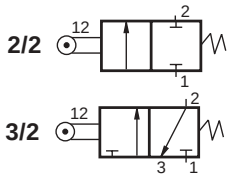
Model Description	Pipe Sizes	Numbers	1-2 Cv	2-3 Cv	Weight lb. (kg)
Dual 3-way, no levers/handle	1/8”	1442H75	0.24	0.42	0.7 (0.3)
Dual 2-way high flow, no levers/handle	1/4”	1443H75	0.73	0.55	0.8 (0.4)
Triple 3-way, no levers/handle	1/4”	1466H75	0.24	0.42	1.2 (0.5)
Dual 3-way; two levers only	1/8”	2025A1900	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

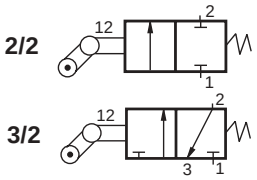
2/2 and 3/2 Cam Valves



ROLLER

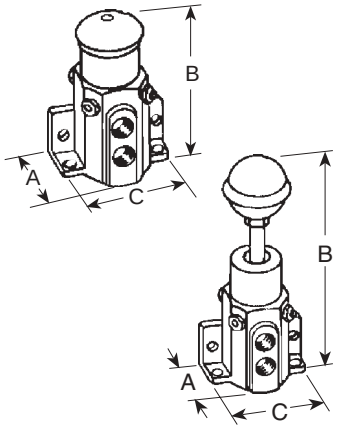


1-WAY ROLLER

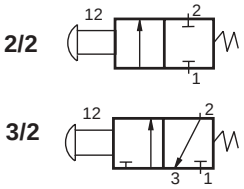


Port Size	Valve Type	Valve Model Numbers	Average C_v	Dimensions inches (mm) A	B	C	Weight lb. (kg)
1/4	2/2 - Roller	1131A2001	0.5	1.82 (46)	4.37 (111)	2.76 (70)	1.0 (0.5)
1/4	3/2 - Roller	1133A2001	0.5	1.82 (46)	4.37 (111)	2.76 (70)	1.0 (0.5)
1/4	2/2 - 1-Way Roller	1131A2002	0.5	1.82 (46)	4.50 (114)	2.76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

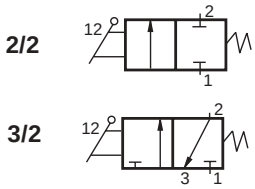
2/2 and 3/2 Lever and Pushbutton Valves



PUSHBUTTON

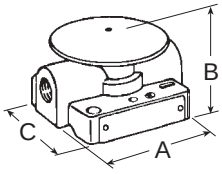


TOGGLE

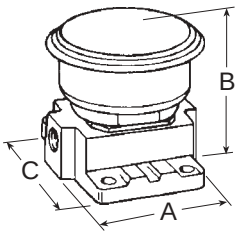


Port Size	Valve Type	Valve Model Numbers	Average C_v	Dimensions inches (mm) A	B	C	Weight lb. (kg)
1/4	2/2 - Pushbutton	1121A2001	0.5	1.82 (46)	3.27 (83)	2.76 (70)	1.0 (0.5)
1/4	3/2 - Pushbutton	1123A2001	0.5	1.82 (46)	3.27 (83)	2.76 (70)	1.0 (0.5)
1/4	2/2 - Toggle	1121A2002	0.5	1.82 (46)	5.92 (150)	2.76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

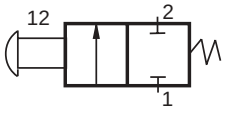


RD- Regular Duty

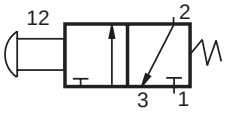


HD- Heavy Duty

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:

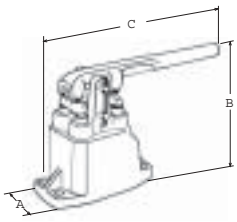
For RD valves: 279B30
For HD valves: 278B30

IMPORTANT NOTE
Please read carefully and thoroughly all of the **CAUTIONS** on page 89.

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.

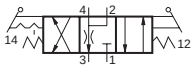
Series 31 & 36 Manual Valves

4/3 Lever Valves

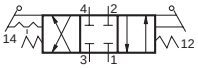


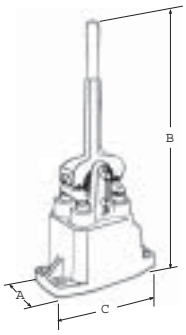
3 Positions,
All Ports on Bottom Face

OPEN CENTER



CLOSED CENTER



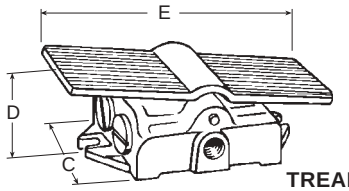


Port Size	Valve Model Numbers	Avg. C_V	Closed/Open Center	Dimensions inches (mm) A	B	C	Weight lb. (kg)
3/8	3126A3007	1.6	Open	2.12 (54)	4.40 (112)	8.06 (205)	2.0 (.9)
3/8	3126A3010	1.6	Closed	2.12 (54)	4.40 (112)	8.06 (205)	2.0 (.9)
1/2	3126A4007	2.6	Open	2.75 (70)	5.53 (140)	11.16 (284)	3.8 (1.7)
1/2	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)
3/4	3126A5009	4.6	Open	3.3 (83)	15.2 (385)	6.4 (162)	6.6 (3.0)
3/4	3126A5012**	4.6	Open	3.3 (83)	15.2 (385)	6.4 (162)	6.6 (3.0)
3/4	3126A5013	4.6	Closed	3.3 (83)	15.2 (385)	6.4 (162)	6.6 (3.0)
3/4	3126A5014**	4.6	Closed	3.3 (83)	15.2 (385)	6.4 (162)	6.6 (3.0)

** Non-detented models.

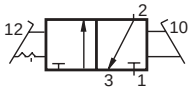
3/2 and 4/2 Pedal and Treadle Valves

PEDAL

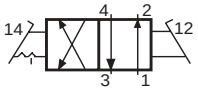


TREADLE

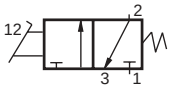
3/2



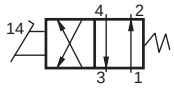
4/2



3/2

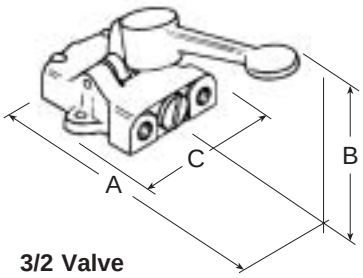


4/2

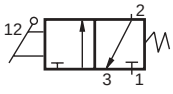


Port Size	Valve Type	Valve Model Numbers	Avg. C_V	Dimensions inches (mm) A	B	C	D	E	Weight lb. (kg)
1/4	3/2 — Pedal	3643A2002	1.2	6.35 (161)	2.55 (65)	3.44 (87)	1.90 (48)	6.00 (152)	1.3 (.6)
1/4	3/2 — Treadle	3643A2001	1.2	6.35 (161)	2.55 (65)	3.44 (87)	1.90 (48)	6.00 (152)	1.3 (.6)
1/4	4/2 — Pedal	3646A2002	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)

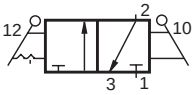
3/2 and 4/2 Lever Valves



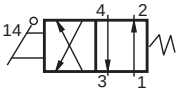
3/2 Valve Illustrated



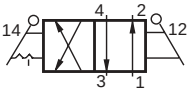
3/2 Spring Return



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)

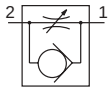
*For models with vertical handle, consult ROSS.

IMPORTANT NOTE
Please read carefully and thoroughly all of the **CAUTIONS** on page 89.

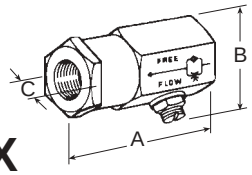
STANDARD SPECIFICATIONS: For valves on this page.
Ambient/Media Temperature: 40° to 175°F (4° to 80°C).
Flow Media: Filtered air. 5 micron recommended.
Inlet Pressure: *Series 31:* 5 to 150 psig (0.3 to 10 bar).
Series 36: 30 to 125 psig (0.3 to 8.5 bar).

Flow Control Valves

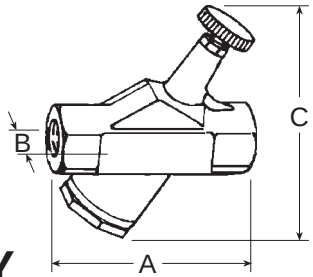
Flow Control Valves



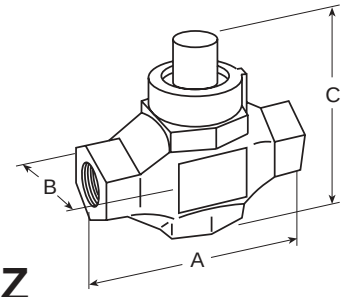
Flow control valves are used to control air flow from air cylinders, thereby controlling the speeds at which the pistons in the cylinders move. They allow free flow in one direction and adjustable, precision controlled flow in the other direction. Adjustment in the X-type models is by means of a screwdriver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



X



Y



Z

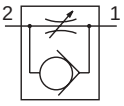
Valve Type	Port Size	Valve Model Number	Avg. C_V (Fully open)	Dimensions inches (mm) A	B	C	Weight lb. (kg)
X	1/8	1968D1004	0.5	2.4 (62)	1.3 (33)	1.0 (25)	0.5 (0.2)
	1/4	1968D2004	0.5	2.4 (62)	1.3 (33)	1.0 (25)	0.5 (0.2)
	3/8	1968D3014	0.5	2.4 (62)	1.3 (33)	1.0 (25)	0.5 (0.2)
Y	1/4	1968B2007	2.3	3.5 (89)	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				

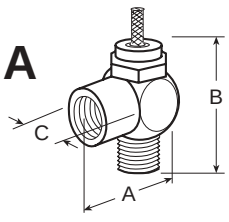
Right Angle Flow Control Valves

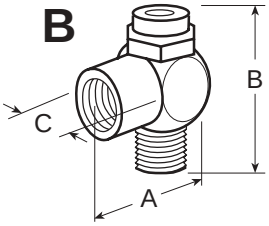
Right angle flow control valves function like those described above. However, their compact right angle design permits use where conventional straight-through flow controls might be undesirable.

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.

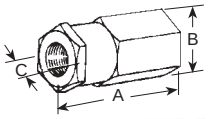
IMPORTANT NOTE
Please read carefully and thoroughly all of the **CAUTIONS** on page 89.

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).

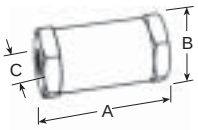
Check and Shuttle Valves

Check Valves

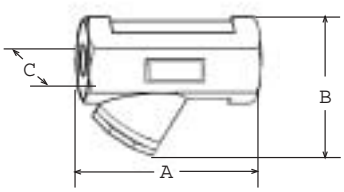
X



Y



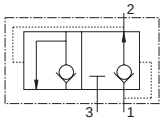
Z

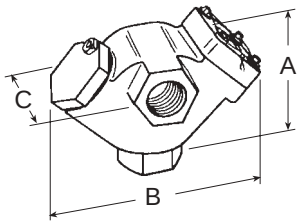


Valve Type	Port Size	Valve Model Number	Avg. C_V	Dimensions inches (mm) A	B	C	Weight lb. (kg)
X	1/8	1968D1005	0.5	2.7 (67)	1.2 (29)	1.0 (25)	0.5 (0.2)
	1/4	1968D2005	0.5				
Y	1/4	1968D2001	2.9	2.8 (71)	1.6 (40)	1.4 (35)	
	3/8	1968D3001	3.7	2.8 (71)	1.6 (40)	1.4 (35)	0.5 (0.2)
	1/2	1968D4001	3.9	3.7 (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



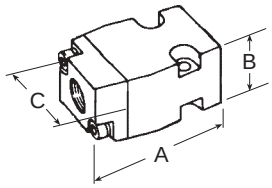


Port Size In-Out	Port Size Exh.	Valve Model Number	Avg. C_V In-Out	Avg. C_V Out-Exh.	Dimensions inches (mm) A	B	C	Weight lb. (kg)
3/8	1/2	1868A3005	2.9	3.4	3.2 (81)	4.7 (119)	2.0 (51)	1.0 (0.5)
1/2	1/2	1868A4005	2.9	3.4	3.2 (81)	4.7 (119)	2.0 (51)	1.0 (0.5)
3/4	1	1868A5005	7.2	10	4.3 (110)	6.5 (165)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

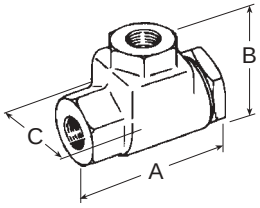
Shuttle Valves

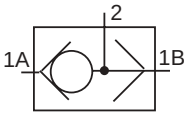
ROSS shuttle valves have two inlets and one outlet. The first inlet to be pressurized is connected to the outlet, and the second inlet is then closed. Thus, a pneumatic device connected to the shuttle outlet can be operated by either of two control valves connected to the shuttle inlets.

Y



Z





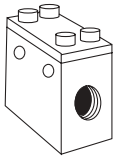
Valve Type	Port Size	Valve Model Number	Average C_V	Dimensions inches (mm) A	B	C	Weight lb. (kg)
Y	1/8	1968D1006	1.1	2.12 (54)	1.06 (27)	1.90 (48)	0.3 (0.1)
	1/4	1968D2006	1.6	2.12 (54)	1.06 (27)	1.90 (48)	0.3 (0.1)
Z	1/4	1968D2003	2.0	2.64 (67)	2.13 (54)	1.25 (32)	0.8 (0.4)
	3/8	1968D3003	3.0	2.64 (67)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

IMPORTANT NOTE
Please read carefully and thoroughly all of the **CAUTIONS** on page 89.

STANDARD SPECIFICATIONS: For valves on this page.
Ambient/Media Temperature: 40° to 175°F (4° to 80°C).
Flow Media: Filtered air. 5 micron recommended.
Inlet Pressure: 15 to 150 psig (1 to 10 bar).
Signal Pressure: Must be equal to or greater than inlet.

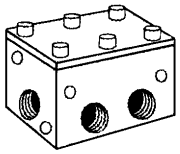
Check Valves

Pilot-Operated Check Valves

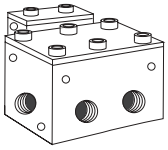


Type A Single P.O. Check Valve
Ports: 1/4, 3/8, 1/2

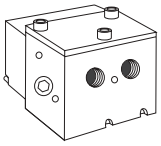
Type B Single P.O. Check Valve
Ports: 1/4 through 1-1/2



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

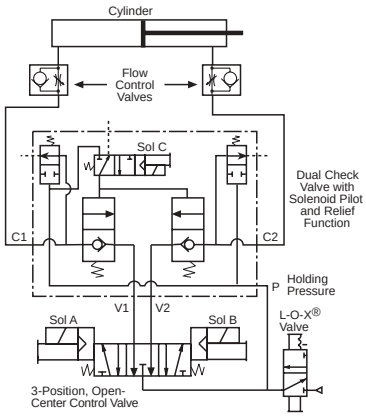


Type D Internal Pilot Dual P.O. Check Valve (Manual Trapped Pressure Relief) Ports: 3/8 through 1

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

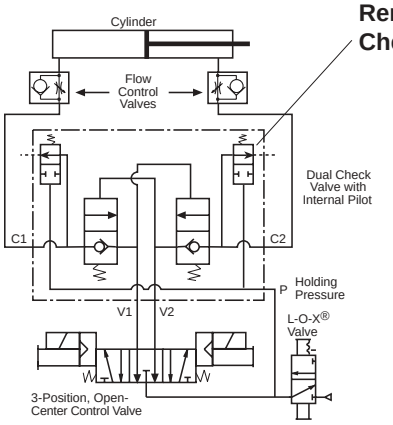
- Can be used wherever a high-flow or remotely-controlled checking function is needed.
- Can be used in a circuit to provide automatic stopping of a cylinder in the event of the loss of electrical or pneumatic power.
- Also available with an Automatic exhausting function, Remote and Manual Trapped Pressure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



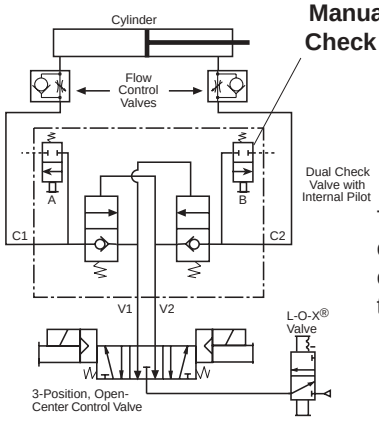
Pressure in cylinder is exhausted when the air supply at port "P" is lost or locked out.

Remote Trapped Pressure Relief



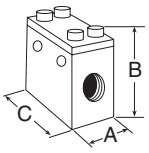
Trapped pressure between check valve and cylinder is exhausted when the air supply at "P" port is lost or locked out.

Manual Trapped Pressure Relief

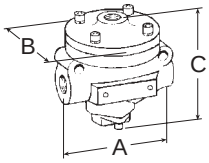


Trapped pressure between check valve and cylinder is exhausted when push buttons A and B are pressed.

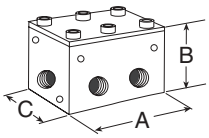
Pilot-Operated Check Valves



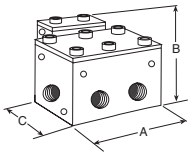
A**



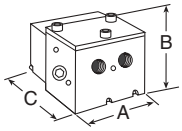
B



C**



D **Remote**

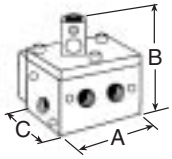


D **Manual**

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 Cv 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 66. 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.

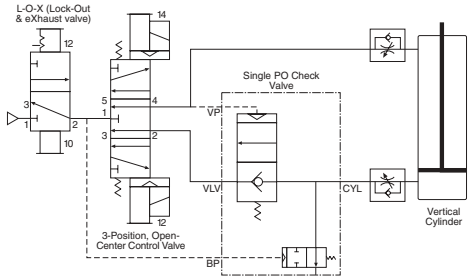
For further installation and application information, consult ROSS Bulletin 430.

IMPORTANT NOTE
Please read carefully and thoroughly all of the **CAUTIONS** on page 89.

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.

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.

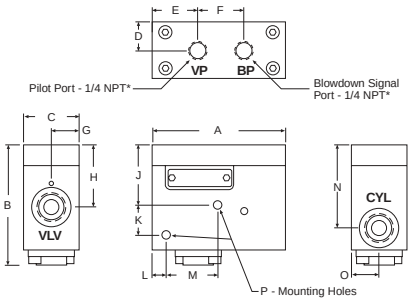
IMPORTANT NOTES and CAUTIONS:

- 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.

IMPORTANT NOTE
Please read carefully and thoroughly all of the **CAUTIONS** on page 89.

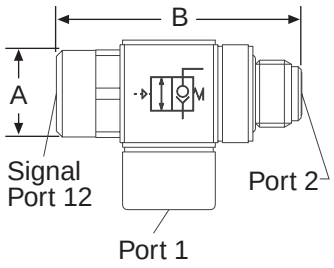
STANDARD SPECIFICATIONS: For valves on this page.
Ambient/Media Temperature: 40° to 175°F (4° to 80°C).
Flow Media: Filtered air.
Inlet Pressure: 15 to 150 psig (1 to 10 bar)
Pilot Pressure: Must be equal to or greater than inlet pressure.

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.

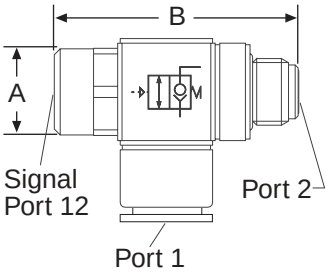


Threaded Banjo

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

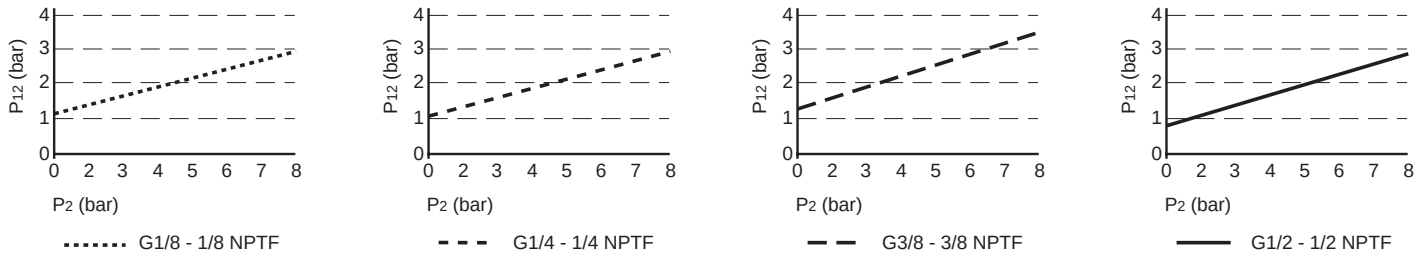
Models with Push-to-Connect Fitting

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.

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

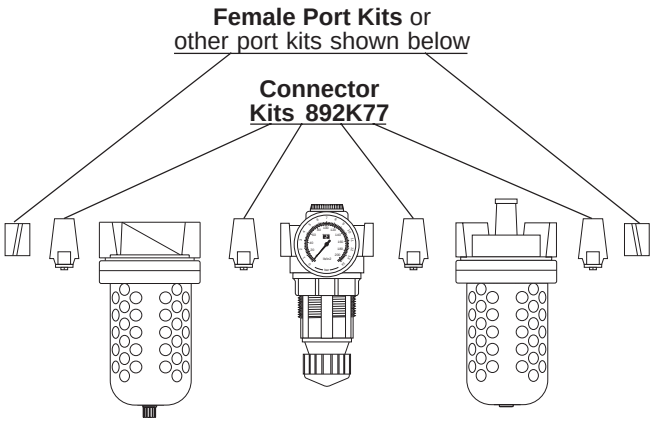
Signal Pressure: The charts below show the minimum signal pressure (P12) to open the valve versus port 2 pressure (P_2) when there is no pressure at port 1 (P_1 = 0 bar).



IMPORTANT NOTE
Please read carefully and thoroughly all of the **CAUTIONS** on page 89.

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).

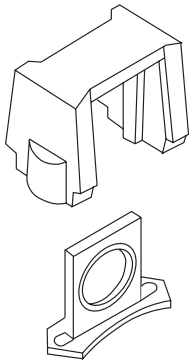
Air Preparation Products



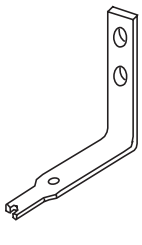
Typical Modular FRL Installation

CONVENTIONAL or MODULAR INSTALLATION
The smallest filters, regulators, and lubricators shown in this catalog (the 1/8 to 1/4 port sizes) are for modular installation only. The other units have threaded ports so that they can be installed using conventional fittings. Those with port sizes from 1/4 to 3/4 can also be installed as modular units by using the port and connector kits shown below.
Modular installation allows units to be removed and replaced quickly, and without disturbing the inlet or outlet piping.

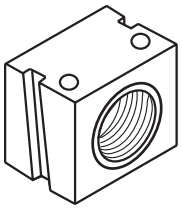
PORT THREADS: Port kits below specify NPT threads. For parallel BSP threads, prefix the kit number with the letter "D" (e.g., D897K77).



Connector Kit 892K77 – Connects units to one another as well as to any of the ports shown below. Kit includes a seal assembly, slide-on connector, and two retaining screws

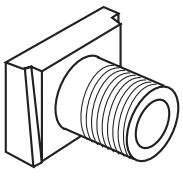


Mounting Bracket Kit 915K77 – shaped metal brackets are used for wall mounting modular assemblies. Kit contains two brackets and four screws for attaching brackets to tops of modular units.



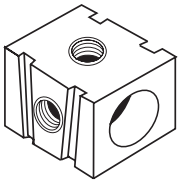
Female Port Kits – Install at inlet and outlet.

1/4 — Kit **897K77**
3/8 — Kit **898K77**
1/2 — Kit **899K77**
3/4 — Kit **900K77**

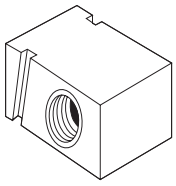


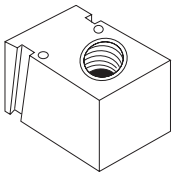
Male Port Kits — Use to connect modular to non-modular products. Also use to make 90-degree connections to the *Extra Port, Side Port,* or *Bracket Ports* shown at right.

1/4 — Kit **893K77**
3/8 — Kit **894K77**
1/2 — Kit **895K77**
3/4 — Kit **896K77**



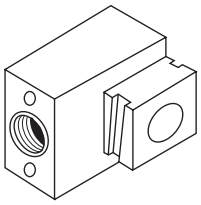
Extra Port Kit 901K77 – Use before or after any modular unit to supply three auxiliary 1/4 outlet ports.





Side Port Kits – Side port functions as a 90-degree female port. Three types: (1) port at front or back; (2) port at top; (3) port at bottom.

	Front/Back	Top	Bottom
1/4	**902K77**	**906K77**	**1000K77**
3/8	**903K77**	**907K77**	**1001K77**
1/2	**904K77**	**908K77**	**1002K77**
3/4	**905K77**	**909K77**	**1003K77**



Bracket Port Kit – Allows modular units to be panel mounted. Bracket accommodates 1/4-inch (M6) mounting bolts. 90-degree port is 1/2.

Front mounting – Kit **910K77**
Back mounting – Kit **1004K77**

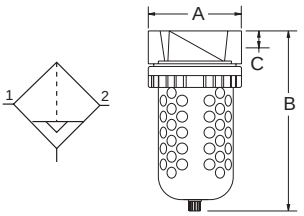
Shutoff Valve — In "off" position downstream air is exhausted to atmosphere. Can be padlocked in "off" position for safety.

1/4 — Kit **911K77**
3/8 — Kit **912K77**
1/2 — Kit **913K77**
3/4 — Kit **914K77**

Air Filters

Port Size	Model Numbers With Automatic Drain: Plastic Bowl	Metal Bowl	Flow Rating[1] scfm (liter/min)	Dimensions inches (mm): A	B	C	Weight lb. (kg)
1/8	5B01B0100[2]	5B01B0200[2]	30 (850)	3.0 (76)	4.1 (105)	0.5 (13)	0.5 (0.2)
1/4	5B02B0100[2]	5B02B0200[2]	30 (850)	3.0 (76)	4.1 (105)	0.5 (13)	0.5 (0.2)
1/4	5021B2007	5022B2007	45 (1270)	2.7 (68)	5.2 (131)	0.63	1.3 (0.6)
3/8	5021B3027	5022B3027	65 (1840)	2.7 (68)	5.2 (131)	0.63	1.3 (0.6)
1/2	5021B4007	5022B4007	75 (2100)	2.7 (68)	5.2 (131)	0.63	1.3 (0.6)
1/4	5021B2008	5022B2005	45 (1270)	3.5 (89)	6.4 (162)	0.63 (16)	2.3 (1.0)
3/8	5021B3008	5022B3005	85 (2400)	3.5 (89)	6.4 (162)	0.63 (16)	2.3 (1.0)
1/2	5021B4008	5022B4005	130 (3680)	3.5 (89)	6.4 (162)	0.63 (16)	2.3 (1.0)
3/4	5021B5018	5022B5015	155 (4380)	3.5 (89)	6.4 (162)	0.63 (16)	2.3 (1.0)
3/4	5021B5008[3]	5022B5005[3]	225 (6370)	4.5 (115)	8.8 (224)	0.81 (21)	2.5 (1.1)
1	5021B6008[3]	5022B6005[3]	275 (7780)	4.5 (115)	8.8 (224)	0.81 (21)	2.5 (1.1)
1-1/4	—	5022B7019	650 (18370)	5.5 (14)	10.7 (27)	1.5 (3)	4.5 (2.0)
1-1/2	—	5022B8019	650 (18370)	5.5 (14)	10.7 (27)	1.5 (3)	4.5 (2.0)
1-1/4	—	5022B7018[3]	950 (26900)	8.0 (203)	15 (381)	1.75 (44)	14.5 (6.5)
1-1/2	—	5022B8018[3]	950 (26900)	8.0 (203)	15 (381)	1.75 (44)	14.5 (6.5)
2	—	5022B9018[3]	950 (26900)	8.0 (203)	15 (381)	1.75 (44)	14.5 (6.5)
Manual Drain Coalescing Filters (no Auto Drain available in Coalescing)							
1/4	5031B2008	5032B2018	16 (7.5)	3.5 (89)	7.5 (191)	1.8 (45)	2.3 (1.0)
3/8	5031B3008	5032B3018	16 (7.5)	3.5 (89)	7.5 (191)	1.8 (45)	2.3 (1.0)
1/2	5031B4008	5032B4018	16 (7.5)	3.5 (89)	7.5 (191)	1.8 (45)	2.3 (1.0)
	5031B4028	5032B4028	48 (23)	3.5 (89)	7.5 (191)	1.8 (45)	3.3 (1.5)

[1] At 100 psig (7 bar) inlet pressure and 3 psi (0.2 bar) pressure drop.
[2] Not for conventional fittings; female fittings for modular installation included.
[3] Not available for modular installation.



Also available: Coalescing Filters. See *ROSS Bulletin 420A* for more information.

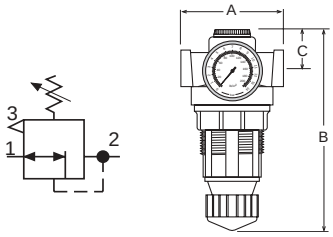
STANDARD SPECIFICATIONS
Ambient/Media Temperature: 40° to 125°F (4° to 52°C). Extended to 175°F (79°C) for 5022 metal bowl models.
Filter Rating: 5 microns.
Flow Media: Compressed air.
Maximum Pressure: 150 psig (10 bar). Extended to 200 psig (14 bar) for 5022 metal bowl models. With automatic drain, inlet pressure must be at least 15 psig (1 bar.).
Threads: Model numbers in chart specify NPT port threads. For ISO 228/1 parallel threads place the letter C before the model number (e.g., C5B01B0100) when ordering.

IMPORTANT NOTE
Please read carefully and thoroughly all of the **CAUTIONS** on pages 64 and 89. *Especially note the partial list of substances that can harm plastic bowls and cause a hazardous condition.*

Pressure Regulators

Port Size	Model Numbers Regulated Pressure Range[1]: 0 to 100 psig (0 to 7 bar)	0 to 125 psig (0 to 8.5 bar)	Flow Rating[2] scfm (liter/min)	Dimensions inches (mm): A	B	C	Weight lb. (kg)
1/8	5B01B0010[3]	—	30 (850)	1.6 (41)	3.5	0.5	0.3 (0.1)
1/4	5B02B0010[3]	—	30 (850)	1.6 (41)	3.5	0.5	0.5 (0.2)
1/4	5211B2015	—	45 (1270)	2.6 (66)	4.6 (118)	1.3 (33)	1.0 (0.5)
3/8	5211B3015	—	65 (1840)	2.6 (66)	4.6 (118)	1.3 (33)	1.0 (0.5)
1/2	5211B4015	—	75 (2100)	2.6 (66)	4.6 (118)	1.3 (33)	1.0 (0.5)
1/4	—	5211B2017	45 (1270)	3.5 (89)	7.0 (179)	1.3 (33)	2.3 (1.0)
3/8	—	5211B3017	85 (2400)	3.5 (89)	7.0 (179)	1.3 (33)	2.3 (1.0)
1/2	—	5211B4017	130 (3680)	3.5 (89)	7.0 (179)	1.3 (33)	2.3 (1.0)
3/4	—	5211B5027	155 (4380)	3.5 (89)	7.0 (179)	1.3 (33)	2.3 (1.0)
3/4	5211D5017[4]	—	225 (6370)	4.4 (111)	8.2 (209)	2.0 (52)	2.5 (1.1)
1	5211D6017[4]	—	275 (7780)	4.4 (111)	8.2 (209)	2.0 (52)	2.5 (1.1)
1-1/4	5211C7017[4]	—	950 (26900)	4.9 (124)	8.2 (208)	1.7 (43)	2.5 (1.1)
1-1/2	5211C8017[4]	—	950 (26900)	4.9 (124)	8.2 (208)	1.7 (43)	2.5 (1.1)

[1] Consult ROSS for other ranges: 0 to 50 psig (3.4 bar); 0 to 200 psig (13.8 bar).
[2] For comparison with filters and lubricators.
[3] Not for conventional fittings; female fittings for modular installation included.
[4] Not available for modular installation.



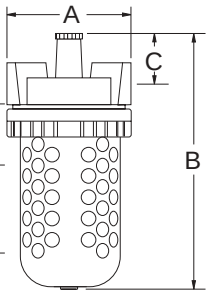
Also available: Reverse Flow regulators with knob or T-handle adjustment and Remote Pilot regulators. See *ROSS Bulletin 420* for more information.

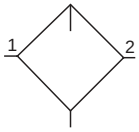
STANDARD SPECIFICATIONS
Ambient/Media Temperature: 40° to 125°F (4° to 52°C). Extended to 175°F (80°C) for 5211 models
Flow Media: Compressed air.
Inlet Pressure: 17 bar (250 psig) maximum.
Gauge Ports: 1/8 for 5B01 and 5B02 models; 1/4 for all others.
Threads: Model numbers in chart specify NPT port threads. For ISO 228/1 parallel threads place the letter C before the model number when ordering.

Air Preparation Products

Air Line Lubricators

Port Size	Model Numbers Plastic Bowl	Model Numbers Metal Bowl	Flow Ratings scfm (liter/min)	inches (mm) A	inches (mm) B	inches (mm) C	Weight lb. (kg)
1/8	5B01B0005F	5B01B0006F	1-25 (28-700)	3.0 (76)	4.4 (113)	0.9 (22)	0.5 (0.2)
1/4	5B02B0005F	5B02B0006F	1-25 (28-700)	3.0 (76)	4.4 (113)	0.9 (22)	0.5 (0.2)
1/4	5111B2007	5112B2007	2-40 (56-1130)	2.7 (68)	5.9 (149)	1.8 (46)	1.1 (0.6)
3/8	5111B3007	5112B3007	2-75 (56-2120)	2.7 (68)	5.9 (149)	1.8 (46)	1.1 (0.6)
1/2	5111B4007	5112B4007	2-110 (56-3100)	2.7 (68)	5.9 (149)	1.8 (46)	1.1 (0.6)
1/4	5111B2008	5112B2008	2-40 (60-1130)	3.5 (89)	6.6 (169)	1.3 (32)	2.3 (1.0)
3/8	5111B3008	5112B3008	2-65 (60-1840)	3.5 (89)	6.6 (169)	1.3 (32)	2.3 (1.0)
1/2	5111B4008	5112B4008	2-120 (60-3400)	3.5 (89)	6.6 (169)	1.3 (32)	2.3 (1.0)
3/4	5111B5008	5112B5008	2-130 (60-3700)	3.5 (89)	6.6 (169)	1.3 (32)	2.3 (1.0)
3/4	5111B5009#	5112B5009#	10-345 (280-9760)	4.6 (118)	9.6 (245)	1.4 (37)	2.8 (1.3)
1	5111B6009#	5112B6009#	10-350 (280-9900)	4.6 (118)	9.6 (245)	1.4 (37)	2.8 (1.3)
1-1/4	5111B7009#	5112B7009#	10-450 (280-12700)	4.6 (118)	9.6 (245)	1.4 (37)	2.8 (1.3)
1-1/2	5111B8009#	5112B8009#	10-500 (280-14100)	4.6 (118)	9.6 (245)	1.4 (37)	2.8 (1.3)



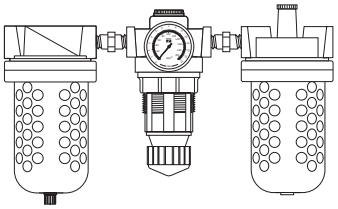


F Not for conventional fittings; female fittings for modular installation included.
Not available for modular installation.

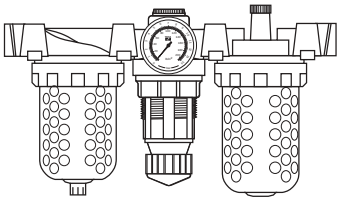
STANDARD SPECIFICATIONS
Ambient/Media Temperature: 40° to 125°F (4° to 52°C). Extended to 150°F (66°C) for 5112 metal bowl models.
Flow Media: Compressed air.
Maximum Pressure: 150 psig (10 bar). Extended to 200 psig (14 bar)) for 5112 metal bowl models.
Threads: Model numbers below specify NPT port threads. For ISO 228/1 parallel threads place the letter C before the model number (e.g., C5B01B0005) when ordering.

IMPORTANT NOTE
Please read carefully and thoroughly all of the **CAUTIONS** on pages 64 and 89. *Especially note the partial list of substances that can harm plastic bowls, and the use of compatible lubricants to avert the creation of potentially hazardous conditions.*

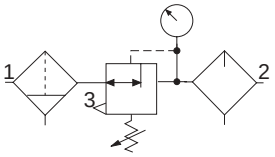
Filter, Regulator, Lubricator, Gauge Combinations



Conventional Assembly



Modular Assembly

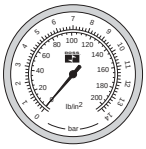


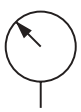
Port Size	Maximum Regulated Pressure psig (bar)	Model Numbers (Filter with automatic drain) Modular Assembly	Model Numbers (Filter with automatic drain) Conventional Assembly	Weight lb. (kg)
1/8	100 (7)	5B01B0115	—	0.8 (0.4)
1/4		5B02B0115	—	0.8 (0.4)
1/4		5M11B2111	5M00B2111	3.8 (1.7)
3/8	100 (7)	5M11B3111	5M00B3111	3.8 (1.7)
1/2		5M11B4111	5M00B4111	3.8 (1.7)
1/4		5F11B2121	5F00B2121	7.3 (3.3)
3/8	125 (8.5)	5F11B3121	5F00B3121	7.3 (3.3)
1/2		5F11B4121	5F00B4121	7.3 (3.3)
3/4		5F11B5121	5F00B5121	7.3 (3.3)
3/4	100 (7)	—	5H00C5111	8.0 (3.6)
1		—	5H00C6111	8.0 (3.6)

Modular Assembly — Includes two female port kits, four connector kits, and pressure gauge.
Conventional Assembly — Includes two pipe nipples and pressure gauge.

STANDARD SPECIFICATIONS:
Ambient/Media Temperature: 40° to 125°F (4° to 52°C).
Filter Rating: 5 microns.
Inlet Pressure: 150 psig (10 bar) maximum.
Regulated Pressure: See chart above.
Threads: Model numbers below specify NPT port threads. For ISO 228/1 parallel threads place the letter C before the model number (e.g., C5B01B0115) when ordering.
Consolidated filters and regulators are also available. Consult ROSS.

Pressure Gauges

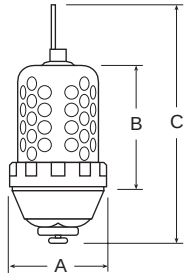




Port Size	Model Numbers	Range psig (bar)	Diameter inches (mm)
1/8	5400A1002	0-160 (0-11)	1.7 (43)
1/4	5400A2010	0-60 (0-4)	2.2 (56)
	5400A2011	0-200 (0-14)	2.2 (56)
	5400A2012	0-300 (0-21)	2.2 (56)

External Drains, Silencer/Reclassifiers

Automatic External Drains



For use where severe condensate problems exist.* These drains are used with FULL-SIZE or HIGH-CAPACITY filters, but can also be used to drain water separators, drain legs, or compressor receiver tanks.

When liquid is present, it is drained regardless of air flow, and there is no loss of air. Discharge rate is approximately 5 gallons per minute at 100 psig. Drain can also be operated manually.

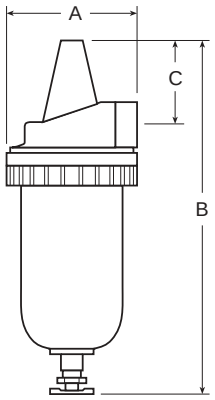
Pipe Size	Model Numbers Plastic Bowl***	Metal Bowl	Dimensions inches (mm) A	B	C	Weight lb. (kg)
1/8	5057B1001	5058B1001	3.5 (89)	4.2 (106)	8.3 (211)	2.8 (1.3)
1/4**	5057B2001	5058B2001	3.5 (89)	4.2 (106)	8.3 (211)	2.8 (1.3)

*Use kit 1076K77 to convert standard bowl for use with automatic external drain.

**Use 1/4" size with Full-Size or High-Capacity filters.

***Plastic bowl includes metal bowl guard.

Silencer/Reclassifiers

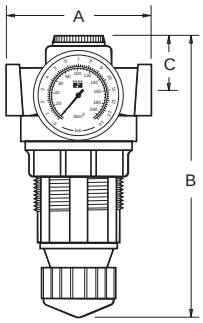


These are integral air-silencer and oil-separation devices. When installed at the exhaust ports of pneumatic valves they capture over 90 per cent of the exhausted lubricants. They also reduce exhaust noise 80 to 85 dba under standardized, steady state conditions, and 106 dba under impact noise conditions.

These units help to meet OSHA requirements for noise and oil mist control. They have been approved by the major automotive manufacturers, and are used on valve-cylinder applications and on air tools with piped exhausts. Both a drain cock and a 1/8" tube fitting are supplied for either manual or automatic draining of accumulated liquids.

Pipe Size	Model Numbers	C_v	Dimensions inches (mm) A	B	C	Weight lb. (kg)
1/2	5055B4009	5.4	3.5 (89)	6.2 (157)	0.7 (17)	1.5 (0.7)
3/4	5055B5009	7.4	4.2 (106)	10.7 (271)	2.7 (68)	3.0 (1.4)
1	5055B6009	7.4	4.2 (106)	10.9 (278)	2.7 (68)	3.0 (1.4)

Reverse-Flow Regulators

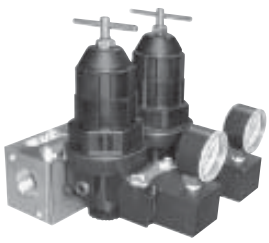


Single-Outlet Reverse-Flow Regulators

Series	Scfm liters/min	Port Size	Model Numbers Knob	T-Handle	Dimensions inches (mm) A	B	C	Weight lb. (kg)
Mid-Size	65 (1840)	3/8	5X00B3024	5X00B3021	2.7 (68)	4.6 (117)	1.3 (33)	1.0 (0.5)
	75 (1840)	3/8	5X00B4023	5X00B4041	2.7 (68)	4.6 (117)	1.3 (33)	1.0 (0.5)
Full-Size	65 (1840)	3/8	5X00B3004	5X00B3012	3.5 (89)	5.5 (139)	1.3 (33)	2.0 (0.9)
	65 (1840)	3/8	5X00B4004	5X00B4047	3.5 (89)	5.5 (139)	1.3 (33)	2.0 (0.9)
	65 (1840)	3/8	5X00B5034	5X00B5044	3.5 (89)	5.5 (139)	1.3 (33)	2.0 (0.9)
	170 (4810)	3/4	5X00B5049	5X00B5050	4.4 (111)	6.5 (165)	1.9 (49)	2.7 (1.2)
High-Capacity	170 (4810)	1	5X00D6003	5X00B6038	4.4 (111)	6.5 (165)	1.9 (49)	2.7 (1.2)
	800 (22650)	1-1/4	5X00C7003	5X00B7016	4.9 (124)	6.7 (170)	1.7 (43)	2.7 (1.2)
	800 (22650)	1-1/2	5X00C8001	5X00B8024	4.9 (124)	6.7 (170)	1.7 (43)	2.7 (1.2)

Multi-Outlet Reverse-Flow Regulators

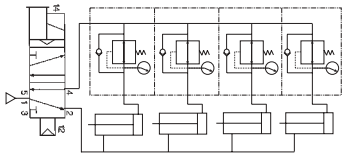
Series	Scfm liters/min	Port Size Inlet	Outlet	Model Number	Dimensions inches (mm) A	B	C	Weight lb. (kg)
Full-Size	65 (1840)	3/4	1/2	3900A05922-*	7.6 (194)	7.4 (188)	1.8 (46)	3.8 (1.7)



Multi-Outlet Regulator: 3900A0592-2

* Includes two full-size regulators. The number after the dash indicates how many regulators are included. For example, if your application requires four regulators, then the model you would order is 3900A0592-4. Gauges sold separately – 5400A1007.

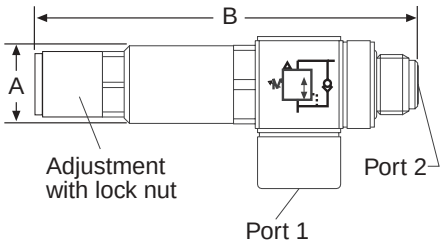
Typical Application



Right-Angle Pressure Regulators

Pressure Regulators – Relieving

Right-angle Regulators are used to control outlet pressure to work devices. Right angle design with banjo for easy positioning of pipe or tubing.

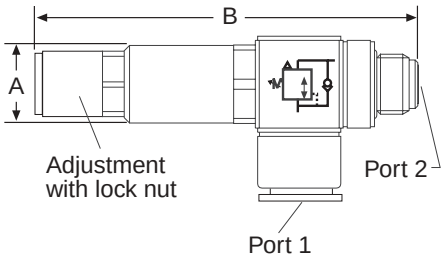


Threaded Banjo

Models with Threaded Banjo

Port Size		Valve Model Numbers	Dimensions inches (mm)		Tightening Torque Max. Ft-lb (Nm)
Port 1*	Port 2**		A	B	
G1/8	G1/8	D5214A1010	0.7 (17)	2.9 (73)	7.38 (10)
G1/4	G1/4	D5214A2010	0.7 (17)	3.2 (81)	8.85 (12)
G3/8	G3/8	D5214A3010	0.9 (22)	3.5 (88)	14.75 (20)
G1/2	G1/2	D5214A4010	1.1 (27)	3.5 (89)	22.13 (30)
1/8	1/4	5214A1010	0.7 (17)	2.9 (73)	11.06 (15)
1/4	1/4	5214A2010	0.7 (17)	3.2 (81)	14.75 (20)
3/8	3/8	5214A3010	0.9 (22)	3.5 (88)	22.13 (30)
1/2	1/2	5214A4010	1.1 (27)	3.5 (89)	29.50 (40)

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

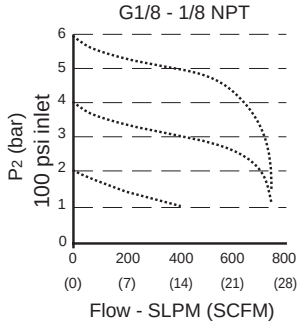


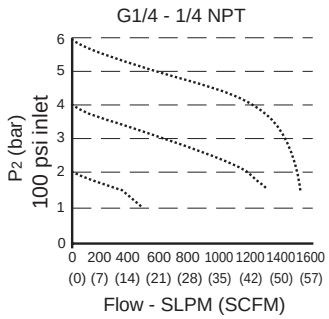
Push-to-Connect Fitting

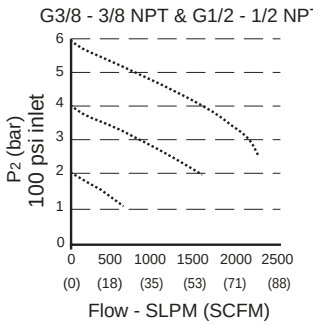
Models with Push-to-Connect Fitting

Port Size		Valve Model Numbers	Dimensions inches (mm)		Tightening Torque Max. Ft-lb (Nm)
Port 1#	Port 2**		A	B	
4.0 6.0 8.0	G1/8	D5214A1140 D5214A1160 D5214A1180	0.7 (17)	2.9 (73)	7.38 (10)
6.0 8.0 10.0	G1/4	D5214A2160 D5214A2180 D5214A2110	0.7 (17)	3.2 (81)	8.85 (12)
8.0 10.0	G3/8	D5214A3180 D5214A3110	0.9 (22)	3.5 (88)	14.75 (20)
5/32” 1/4”	1/8	5214A1115 5214A1120	0.7 (17)	2.9 (73)	11.06 (15)
1/4” 3/8”	1/4	5214A2120 5214A2130	0.7 (17)	3.2 (81)	14.75 (20)
3/8”	3/8	5214A3130	0.9 (22)	3.5 (88)	22.13 (30)

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



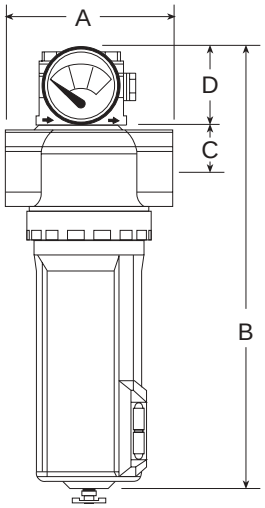




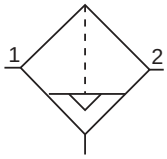
IMPORTANT NOTE
Please read carefully and thoroughly all of the **CAUTIONS** on page 89.

STANDARD SPECIFICATIONS:
Ambient/Media Temperature: 15° to 160°F (-10° to 70°C).
Flow Media: Filtered air. 5 micron recommended.
Inlet Pressure: 15 to 240 psig (1 to 16 bar).
Regulated Pressure Range: 15 to 120 psig (1 to 8 bar).

High Capacity Water & Particulate Removal Filter



Model Numbers	Scfm liters/sec	Drain Port Size	Dimensions inches (mm) A	B	C	D	Weight lb. (kg)
5X00B5082	160 (75)	12 SAE	4.5 (114)	13.6 (346)	1.0 (25)	2.5 (64)	3.9 (1.8)
5X00B6061	200 (94)	16 SAE	4.5 (114)	13.6 (346)	1.0 (25)	2.5 (64)	3.9 (1.8)
5X00B7030	240 (113)	20 SAE	4.5 (140)	14.8 (377)	1.4 (36)	2.5 (64)	6.4 (2.9)
5X00B8033	260 (122)	24 SAE	5.5 (140)	14.8 (377)	1.4 (36)	2.5 (64)	6.4 (2.9)
5X00B5081	160 (75)	3/4 NPT	4.5 (114)	13.6 (346)	1.0 (25)	2.5 (64)	3.9 (1.8)
5X00B6060	200 (94)	1 NPT	4.5 (114)	13.6 (346)	1.0 (25)	2.5 (64)	3.9 (1.8)
5X00B7029	240 (113)	1-1/4 NPT	5.5 (140)	14.8 (377)	1.4 (36)	2.5 (64)	6.4 (2.9)
5X00B8032	260 (122)	1-1/2 NPT	5.5 (140)	14.8 (377)	1.4 (36)	2.5 (64)	6.4 (2.9)



FEATURES:

- Variety of flow rates available from 330 thru 655 Scfm.
- Easy to read large profile gauge shows condition of filter element.
- Gauge is also available in electric pressure switch version with 4-pin micro connector.
- Large bottom drain port allows contaminates to blow down quickly.
- Drain options are manual or automatic float drain.
- Porting Options: SAE 12 - 24
  NPT 3/4-1-1/2
  For additional porting, consult ROSS.
- High flow element is cleanable sintered bronze with 5 micron filtration.
- Easy change filter unit requires no tools.
- Sight glass on bowl shows liquid level.
- Electric gauge available as a stand alone unit if you want feedback for other non-monitored filter components.

IMPORTANT NOTE
Please read carefully and thoroughly all of the **CAUTIONS** on page 89.

STANDARD SPECIFICATIONS:
Ambient/Media Temperature: 40° to 175°F (4° to 79°C).
Flow Media: Compressed air.
Inlet Pressure: 200 psig (14 bar).

Compatible Lubricants

Although air line lubrication is not required for most ROSS valves, other mechanisms in the system may need such lubrication. When a lubricator is used it should be supplied only with oils which are compatible with the materials used in the valves for seals and poppets. Generally speaking, these 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. Oils with phosphate type additives, such as zinc dithiophosphate, must be avoided because they can harm polyurethane valve components. Diester oils must be avoided because they harm Buna N elastomers.

Some of the available compatible lubricants are listed at the right. However, oil manufacturers sometimes change the chemistry of their oils. The oils listed, although believed to be compatible at the time of printing, could change without notice. Therefore, the best oils to use are those specifically compounded for air line lubricator service. If it is a synthetic oil, you should contact the oil manufacturer for compatibility information.

MAKER	BRAND NAME
Amoco	American Industrial Oil 32
	Amoco Spindle Oil C
	Amolite 32
Citgo	Pacemaker 32
Exxon	Spinesstic 22
	Teresstic 32
Mobil	Velocite 10
Non-Fluid Oil	Air Lube 10H/NR
Shell	Turbo T32
Sun	Sunvis 11
	Sunvis 722
Texaco	Regal R&O 32
Union	Union Turbine Oil

Cautions on the Use of Polycarbonate Plastic Bowls

Substances HARMFUL to Polycarbonate Plastic Bowls

Acetaldehyde
Acetic acid
Acetone
Acrylonitrile
Ammonia
Ammonium fluoride
Ammonium hydroxide
Ammonium sulfide
Anaerobic adhesives & sealants
Antifreeze
Benzene
Benzoic acid
Benzyl alcohol
Brake fluids
Bromobenzene
Butyric acid
Carbolic acid
Carbon disulfide
Carbon tetrachloride
Caustic potash solution
Caustic soda solution
Chlorobenzene
Chloroform
Cresol
Cyclohexanol
Cyclohexanone
Cyclohexene
Dimethyl formamide
Dioxane
Ethane tetrachloride
Ethyl acetate
Ethyl ether
Ethylamine
Ethylene chlorohydrin
Ethylene dichloride
Ethylene glycol
Formic acid
Freon (refrigerant & propellant)
Gasoline (high aromatic)
Hydrazine
Hydrochloric acid
Lacquer thinner
Methyl alcohol
Methylene chloride
Methylene salicylate
Milk of lime (CaOH)
Nitric acid
Nitrobenzene
Nirocellulose lacquer
Perchlorethylene
Phenol
Phosphorous hydroxyl chloride
Phosphorous trichloride
Propionic acid
Pyridine
Sodium hydroxide
Sodium sulfide
Styrene
Sulfuric acid
Sulfural chloride
Tetrahydronaphthalene
Thiophene
Toluene
Turpentine
Xylene

Use Only with Compressed Air. Filters and lubricators with polycarbonate plastic bowls are specifically designed for compressed air service, and their use with any other fluid (liquid or gas) is a misapplication. The use with or injection of certain hazardous fluids in the system (e.g., alcohol or liquefied petroleum gas) could be harmful to the plastic bowl or result in a combustible condition or hazardous leakage. Before using with a fluid other than air, or for non-industrial applications, or for life support systems, consult ROSS.

Use Metal Bowl Guard When Supplied. A metal bowl guard is supplied with all but the smallest bowls, and must always be used to minimize danger from fragmentation in the event of failure of a plastic bowl.

Avoid Harmful Substances. Some compressor oils, chemical cleaners, solvents, paints, and fumes will attack plastic bowls and can cause bowl failure. Do not use with or near these materials. When a bowl becomes dirty, replace the bowl or wipe it with a clean dry cloth. Immediately replace any plastic bowl which is crazed, cracked, or deteriorated.

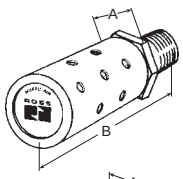
Trade Names of Substances HARMFUL to Polycarbonate Plastic Bowls

• Atlas Perma-Guard • Buna N • Cellulube #150 & #220 • Crylex #5 cement • Eastman 910 • Garlock 98403 (polyurethane) • Haskel 568-023 • Hilgard Company's hil phene • Houghton & Co. oil 1120, 1130, 1055 • Houtosafe 1000 • Kano Kroil • Keystone penetrating oil #2 • Loctite 271, 290, 601 • Loctite Teflon sealant • Marvel Mystery Oil • Minn. Rubber 366Y • National Compound N11 Nylock VC-3 • Parco 1306 Neoprene • Permabond 910 • Petron PD287 • Prestone • Pydraul AC • Sears Regular Motor Oil • Sinclair oil "Lily White" • Stauffer Chemical FYRQUEL 150 • Stillman SR 269-75 (polyurethane) • Stillman SR 513-70 (neoprene) • Tannergas • Telar • Tenneco anderol 495 & 500 oils • Titon • Vibra-tite • Zerex

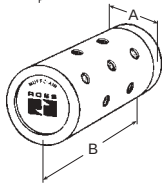
NOTE: *Because we cannot list all substances harmful to polycarbonate plastic, consult a Mobay Chemical or General Electric office for further information.*

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	Average C_V	Dimensions 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.

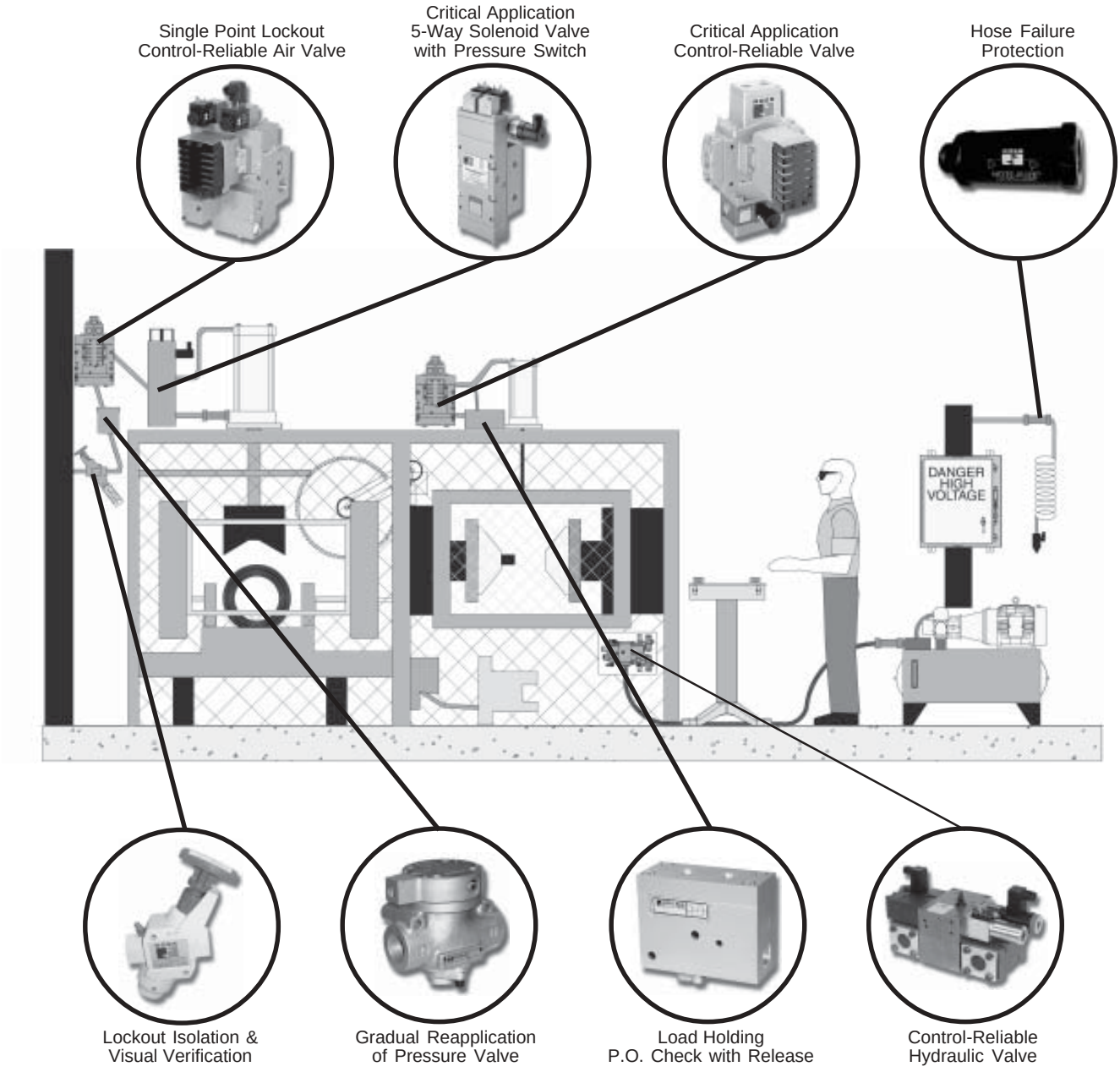
ROSS Safety-Related History

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

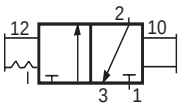
- Control-reliable solenoid operated pneumatic valves.
- Control-reliable solenoid operated hydraulic valves.
- L-O-X® Lock-Out and eXhaust pneumatic energy isolation valves.
- EEZ-ON® soft start pneumatic valves.
- Pilot-operated pneumatic check valves with pressure release.
- HOZE-FUZE™ air hose blow-out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



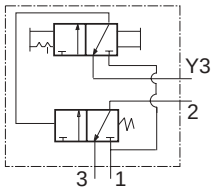
L-O-X® (Lock Out & eXhaust) Valves

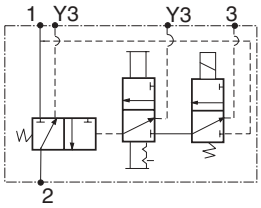
ROSS L-O-X® valves are energy isolation valves and are generally used as the first valve in a line supplying compressed air to equipment. Air can be shut off by pushing the red L-O-X® handle inward; downstream air is simultaneously exhausted through the L-O-X® exhaust port. OSHA compliance requires that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

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.



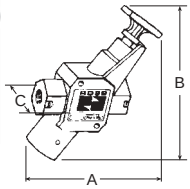
MANUAL



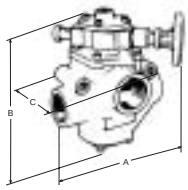


SOLENOID PILOT

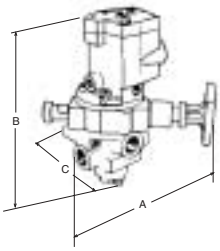
MANUAL



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)
	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

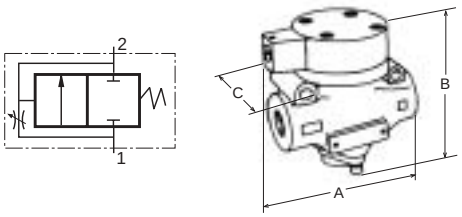
L-O-X® Sensing Port - Series 15 L-O-X® and L-O-X®/EEZ-ON® valves are now provided with 1/8 NPT sensing ports, enabling installation of a pressure sensing device such as the Pop-Up Indicator or Pressure Switch shown below. Standards suggest that machine design should include a method for verifying the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

The ROSS 988H30 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.

2/2 EEZ-ON® Valves



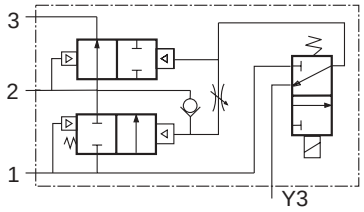
Port Size	Valve Model Numbers	Average C_v	Dimensions inches (mm) A	B	C	Weight lb. (kg)
1/4	2781A2007	2.3	3.8 (97)	3.8 (97)	3.0 (77)	1.5 (0.7)
3/8	2781A3007	3.8	3.8 (97)	3.8 (97)	3.0 (77)	1.5 (0.7)
1/2	2781A4017	4.0	3.8 (97)	3.8 (97)	3.0 (77)	1.5 (0.7)
1/2	2781A4007	7.7	4.6 (117)	4.5 (114)	3.0 (77)	2.3 (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.

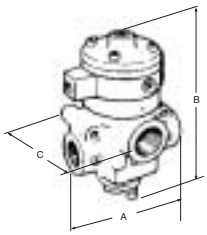
3/2 EEZ-ON® Valves

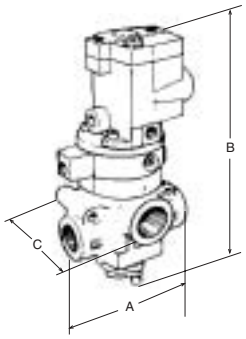
The 3/2 EEZ-ON® valve provides the same gradual pressure buildup as the 2/2 EEZ-ON® valves described above. In addition, the 3/2 valve has an exhaust port so that downstream air is exhausted when the valve is de-energized. At the same time, supply air is positively cut off so that a separate cutoff valve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

IMPORTANT NOTE
Please read carefully and thoroughly all of the **CAUTIONS** on page 89.

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).

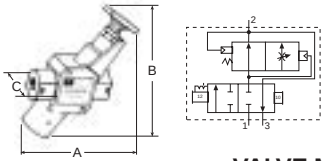
Combination L-O-X®/EEZ-ON® Valves

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.

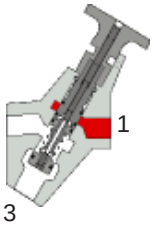
The ROSS L-O-X®/EEZ-ON® valve is the newest addition to ROSS' renowned family of safety-related products. Combining two functions critical to safety concerns in any application, the ROSS L-O-X®/EEZ-ON® valve provides the shutdown and the gradual start-up (or, "soft start") capabilities today's systems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

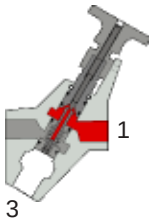


VALVE OPERATION

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.

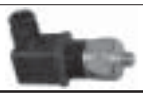
VALVE MODEL NUMBERS & OVERALL DIMENSIONS

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 Cv**	Weight lb. (kg)
3/8	3/4	1523A3102	6.0	8.0	6.4 (163)	8.8 (224)	2.0 (51)	0.6	1.5 (.7)
1/2	3/4	1523A4102	7.1	8.3	6.4 (163)	8.8 (224)	2.0 (51)	0.6	1.5 (.7)
3/4	3/4	1523A5112	8.0	9.5	6.4 (163)	8.8 (224)	2.0 (51)	0.6	1.5 (.7)
3/4	1-1/4	1523A5102	12.0	10.9	7.7 (196)	10.8 (274)	2.3 (58)	3.0	3.3 (1.5)
1	1-1/4	1523A6102	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	1523A7112	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 988H30 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 presenSingle Point Lockout	
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

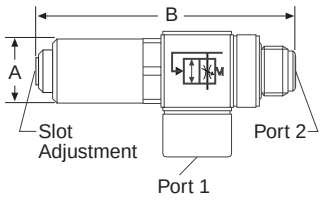
Ambient/Media Temperature: 40 to 175°F (4 to 80°C).
Flow Media: Filtered air. 5 micron filter recommended.
Inlet Pressure: 30 to 150 psig (2 to 10 bar). Toggle Open Pressure = Inlet - 25 psig. If different toggle pressure is needed, contact ROSS Technical Services.

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.

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.

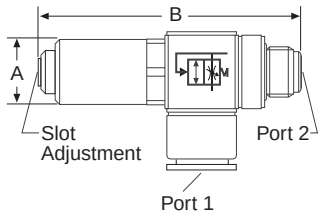


Threaded Banjo

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.



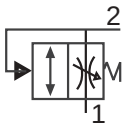
Push-to-Connect Fitting

Models with Push-to-Connect Fitting

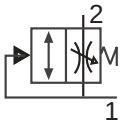
Port Size		Valve Model Numbers		Average C_v	Dimensions inches (mm)		Tightening Torque Max. Ft-lb (Nm)
		Primary Pressure					
Port 1**	Port 2#	At Port 1	At Port 2		A	B	
4.0	G1/8	D1969A1020	D1969A1021	0.5	0.5 (13)	2.3 (57)	7.38 (10)
6.0		D1969A1030	D1969A1031				
8.0		D1969A1040	D1969A1041				
6.0	G1/4	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



IMPORTANT NOTE
Please read carefully and thoroughly all of the **CAUTIONS** on page 89.

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).

HOZE-FUZE™

Reduces the Dangers of Hose and Plastic Tubing Failure

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

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

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

Approximate Flow Before Shut-Off (Cfm)

	50 psi	75 psi	100 psi	125 psi	150 psi	180 psi
1/4	13	15	18	21	23	26
3/8	39	49	58	67	76	87
1/2	65	80	96	111	126	144
3/4	110	126	142	158	174	193
1	173	210	248	285	322	367

IMPORTANT NOTE
Please read carefully and thoroughly all of the **CAUTIONS** on page 89.

STANDARD SPECIFICATIONS:
Body: Aluminum.
Piston: Hostalen.
Maximum Pressure: 260 PSI (17 Bar).
Temperature Range: -4° to 275°F (-20° to 135°C).

Notes

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 or hydraulic 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, though, 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.

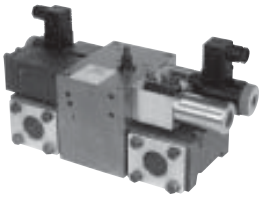
ROSS double valves come in many shapes and sizes from the tough little size 1 and 2 SERPAR® Crossflow valves with pressure switches (for external monitoring) to the size 30 workhorse version with internal monitoring (L-G, E-P, or DS monitors). And do not forget the sophisticated new CROSSMIRROR® valves that are available in 3/2 monitored versions as well as 5/2 non-monitored models. Lastly, but not to be overlooked, is the new Series IM 3/2 hydraulic double valve that is well equipped to handle those critical hydraulic 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.

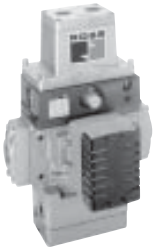
Double Valves with Pressure Switches for External Monitoring feature:

- Covered by multiple global patents and patents pending (CROSSMIRROR®).
- 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 (sizes 4, 8, 12, and 30)

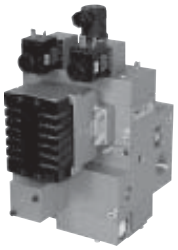


Series IM Hydraulic Double Valve - Internal Monitor & Series EM with Pressure Switches for External Monitoring (not shown).

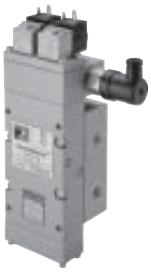
Series 35 - SERPAR Crossflow (3/2), with pressure switches for external monitoring. Available in sizes 1 & 2.



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® (3/2 - dynamic internal monitoring). Available in sizes 2, 4, & 8.



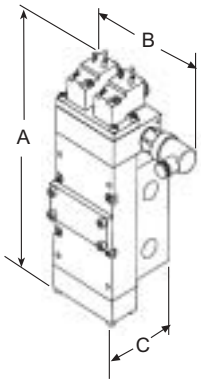
Series 77 - CROSSMIRROR® (5/2), optional pressure switch for external monitoring. Available in size 4.

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 (sizes 4, 8, 12, and 30) and 3/2 Series 77.

Series 77 5/2 CROSSMIRROR® Double Valves

5/2 CROSSMIRROR® double valve with pressure switch



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

Valve Size	Assembly* Model Numbers	Base Numbers	Port Sizes 1	Port Sizes 2,3,4,5	Cv 1-2	Cv 1-4	Cv 2-3	Cv 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)

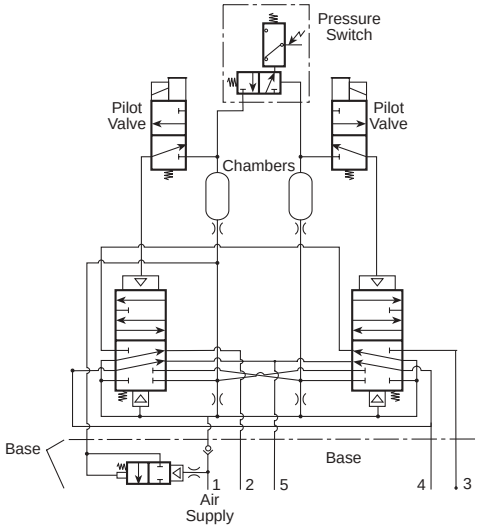
* Model number includes base. •Replacement valve numbers: 7776A4400 (no pressure switch) and 7776A4401 (with pressure switch).

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.

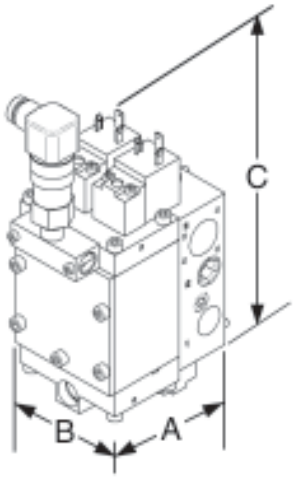


IMPORTANT NOTE
Please read carefully and thoroughly all of the **CAUTIONS** on page 89.

STANDARD SPECIFICATIONS:
Pilot Solenoids: Rated for continuous duty.
Standard Voltages: 100-110 volts 50 Hz; 100-120 volts 60 Hz; 24, 110 volts d.c.

Power Consumption: Each solenoid, 11 VA inrush, 8.5 VA holding on 50 or 60 Hz; 6 watts on d.c.
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).

Series 77 3/2 CROSSMIRROR® Double Valves

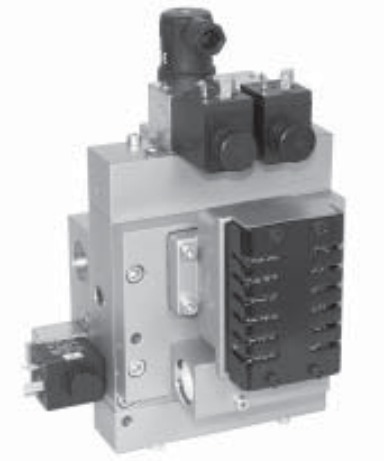


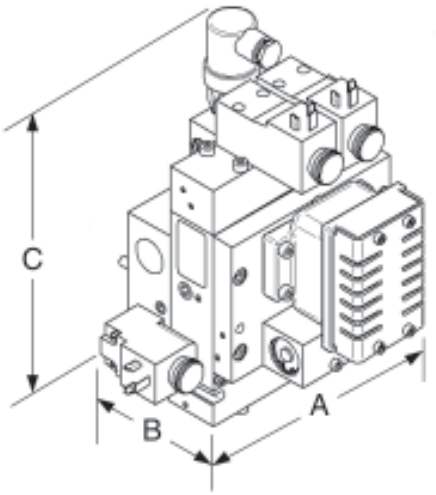
Size 2

Valve Assembly*

Model Numbers	Base Numbers	Reset Option	Port Size	C_v 1-2	C_v 2-3	Pressure Switch	Dimensions inches (mm) A	B	C	Average Response Constants F M	In-Out	Out-Exh.	Weight
7773A3501	1631C91	Customer Supplied	1/2	1.8	5.0	No	3.5 (89)	4.3 (110)	7.8 (198)	29	2.23	0.73	6.7 (3.0)
7773A3502	1630C91	Solenoid	1/2	1.8	5.0	No	3.5 (89)	4.3 (110)	9.0 (229)	29	2.23	0.73	7.0 (3.2)
7773A3503	1631C91	Customer Supplied	1/2	1.8	5.0	Yes	3.5 (89)	5.2 (133)	9.6 (244)	29	2.23	0.73	7.0 (3.2)
7773A3504	1630C91	Solenoid	1/2	1.8	5.0	Yes	3.5 (89)	5.2 (133)	10.8 (275)	29	2.23	0.73	7.4 (3.4)

*Model number includes base. For G threads, order base with a "D" prefix. For SAE threads, order base with a "S" prefix. •Replacement valve numbers: 7773A3402 (no pressure switch) and 7773A3401 (with pressure switch). See page 75 for STANDARD SPECIFICATIONS.





CROSSMIRROR® 3/2 Size 4 is BG Approved

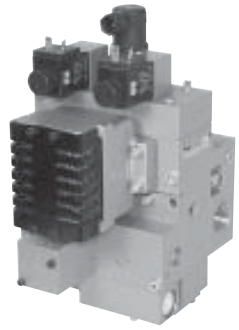
Size 4

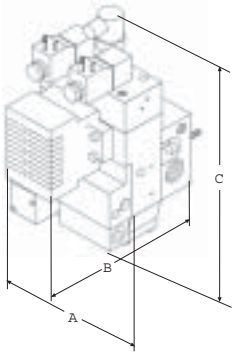
Valve Assembly*

Model Numbers	Base Numbers	Reset Option	Port Size	C_v** 1-2	C_v** 2-3	Pressure Switch	Dimensions inches (mm) A	B	C	Average Response Constants F M	In-Out	Out-Exh.	Weight
7773A4505	1321C91	Customer Supplied	1/2	3.1	4.7	No	5.8 (147)	6.5 (164)	9.2 (233)	34	1.08	0.57	13.2 (6.0)
7773A5505	1219C91	Customer Supplied	3/4	3.9	8.8	No	5.8 (147)	6.5 (164)	9.2 (233)	29	1.00	0.44	14.3 (6.5)
7773A4501	1322C91	Solenoid	1/2	3.1	4.7	No	7.4 (187)	6.5 (164)	9.2 (233)	34	1.08	0.57	13.2 (6.0)
7773A5507	1220C91	Solenoid	3/4	3.9	8.8	No	7.4 (187)	6.5 (164)	9.2 (233)	29	1.00	0.44	14.3 (6.5)
7773A4506	1321C91	Customer Supplied	1/2	3.1	4.7	Yes	5.8 (147)	6.5 (164)	9.8 (249)	34	1.08	0.57	13.2 (6.0)
7773A5506	1219C91	Customer Supplied	3/4	3.9	8.8	Yes	5.8 (147)	6.5 (164)	9.8 (249)	29	1.00	0.44	14.3 (6.5)
7773A4508	1322C91	Solenoid	1/2	3.1	4.7	Yes	7.4 (187)	6.5 (164)	9.8 (249)	34	1.08	0.57	13.2 (6.0)
7773A5508	1220C91	Solenoid	3/4	3.9	8.8	Yes	7.4 (187)	6.5 (164)	9.8 (249)	29	1.00	0.44	14.3 (6.5)

*Model number includes base. For G threads, order base with a "D" prefix. •Replacement valve numbers: 7773A4400 (no pressure switch) and 7773A4401 (with pressure switch). ** With muffler. See page 75 for STANDARD SPECIFICATIONS.

Series 77 3/2 CROSSMIRROR® Double Valves





CROSSMIRROR® 3/2 Size 8 is BG Approved

Size 8

Valve Assembly*

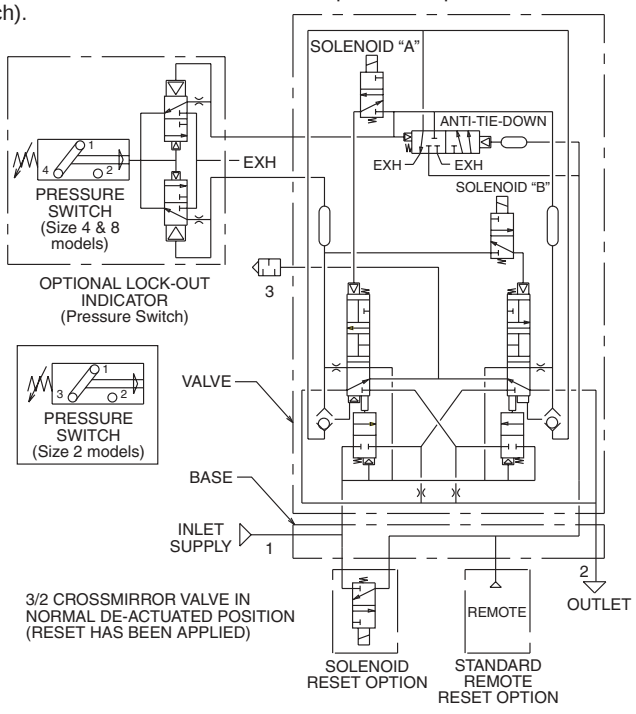
Model Numbers	Base Numbers	Reset Option	Port Size	C_v 1-2	C_v 2-3	Pressure Switch	Dimensions inches (mm) A	B	C	M	Average Response Constants F In-Out	F Out-Exh.	Weight
7773A5501	1207C91	Customer Supplied	3/4	5.3	11.8	No	5.8 (147)	7.7 (196)	10.2 (259)	34	0.68	0.32	16.2 (7.4)
7773A6501	1044C91	Customer Supplied	1	6	13.3	No	5.8 (147)	7.7 (196)	10.2 (259)	34	0.60	0.29	16.2 (7.4)
7773A5502	1207C91	Customer Supplied	3/4	5.3	11.8	Yes	5.8 (147)	7.7 (196)	10.7 (272)	34	0.68	0.32	17.2 (7.8)
7773A6502	1044C91	Customer Supplied	1	6	13.3	Yes	5.8 (147)	7.7 (196)	10.7 (272)	34	0.60	0.29	17.2 (7.8)
7773A5503	1208C91	Solenoid	3/4	5.3	11.8	No	5.8 (147)	7.7 (196)	10.2 (259)	34	0.68	0.32	16.2 (7.4)
7773A6503	1205C91	Solenoid	1	6	13.3	No	5.8 (147)	7.7 (196)	10.2 (259)	34	0.60	0.29	16.2 (7.4)
7773A5504	1208C91	Solenoid	3/4	5.3	11.8	Yes	5.8 (147)	7.7 (196)	10.7 (272)	34	0.68	0.32	17.2 (7.8)
7773A6504	1205C91	Solenoid	1	6	13.3	Yes	5.8 (147)	7.7 (196)	10.7 (272)	34	0.60	0.29	17.2 (7.8)

*Model number includes base. For G threads, order base with a "D" prefix. For JIS threads, order base with a "J" prefix. •Replacement valve numbers: 7773A6400 (no pressure switch) and 7773A6401 (with pressure switch).

FEATURES:**
- Integrated Dynamic Monitoring
- Covered by multiple global patents and patents pending
- 3-way, 2-position design
- "Tamper-Proof" feature – for external/remote reset
- Base-mounted, poppet design
- Designed to enable users to comply with current safety regulations

APPLICATIONS:**
- Press machinery
- Metal stamping facilities
- Amusement park rides
- Shearing equipment
- Safety-related applications

** Features and Applications apply to Series 77 3/2 CROSSMIRROR® Double Valves size 2, size 4, and size 8.



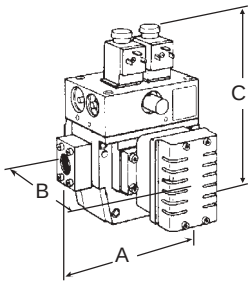
IMPORTANT NOTE
Please read carefully and thoroughly all of the **CAUTIONS** on page 89.

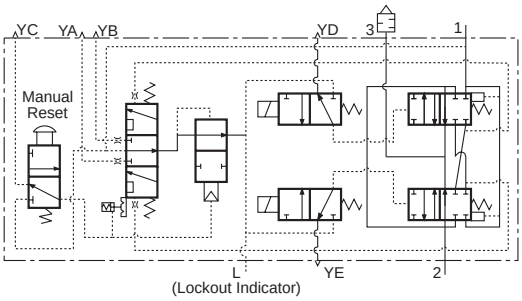
STANDARD SPECIFICATIONS:
Pilot Solenoids: Two, rated for continuous duty.
Standard Voltages: 100-110 volts, 50 Hz; 100-120 volts, 60 Hz; 24, 110 volts d.c. Other voltages available.
Power Consumption: Each solenoid, 30 VA inrush, 16 VA max holding on 50 or 60 Hz; 11 watts nominal on d.c.

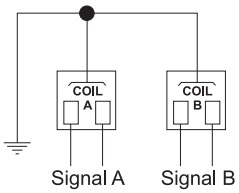
Electrical Connections: Uses cord-grip connectors at solenoids. Order connectors separately (see page 21).
Ambient Temperature: 40° to 120° F (4° to 50° C).
Media Temperature: 40° to 175° F (4° to 80° C).
Flow Media: Filtered air. 5 micron recommended.
Inlet Pressure: 44 to 118 psig (3 to 8 bar).
Reset Pressure: Remote reset option requires reset pressure to be greater than or equal to inlet pressure.

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

Size 4

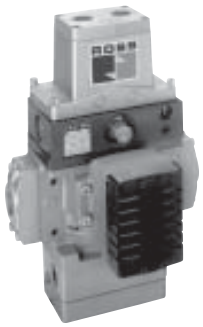


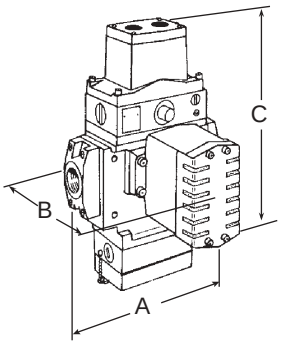


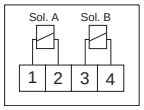


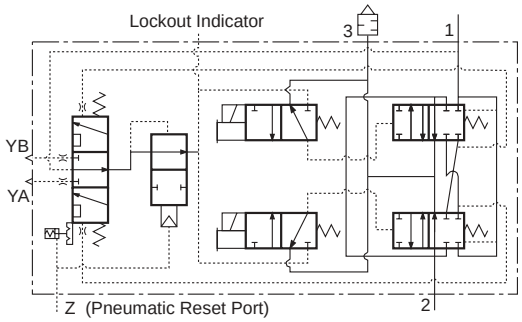
Port Size	Average C_V* In-Out	Out-Exh.	Size	Monitor Reset	Valve Model Numbers Right Inlet	Left Inlet	Dimensions inches (mm) A	B	C	Weight lb. (kg.)
3/8	3.0	6.0	4	Manual	3573D3191	3573D3195	7.4 (188)	6.3 (160)	7.4 (188)	8.3 (3.7)
	3.0	6.0	4	Remote	3573D3192	3573D3196	7.4 (188)	6.3 (160)	7.4 (188)	8.3 (3.7)
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.	Size	Valve Model Numbers 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)

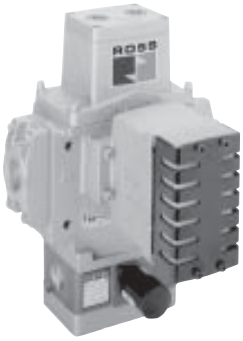
2 inch port size available on size 30 valves. Order part number 1999H77 flange kit separately.

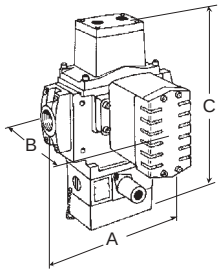
IMPORTANT NOTE
Please read carefully and thoroughly all of the **CAUTIONS** on page 89.

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 21); 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).

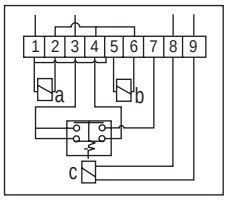
Series 35 SERPAR® Crossflow Double Valves– E-P Monitor

Sizes 8 to 30

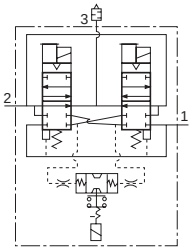




During lock out: Terminals 3 and 7 are connected which allows a panel light, bell, or other electrical device to be wired through terminals 7 and 3 to serve as a lockout indicator.



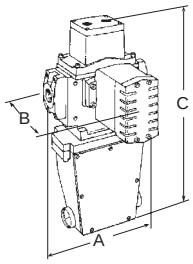
Wiring Diagram

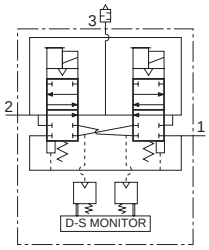


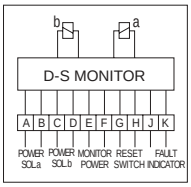
Port Size	Average C_v* In-Out	Out-Exh.	Size	Valve Model Numbers w/Overrides	w/o Overrides	Dimensions inches (mm) A	B	C	Weight lb. (kg.)
1/2	3.5	8.5	8	3573A4141	3573A4161	8.5 (216)	7.2 (184)	11.4 (288)	11.8 (5.3)
3/4	4.0	12	8	3573A5141	3573A5161	8.5 (216)	7.2 (184)	11.4 (288)	11.8 (5.3)
	8.0	15	12	3573A5151	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.

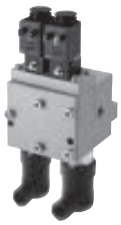
IMPORTANT NOTE
Please read carefully and thoroughly all of the **CAUTIONS** on page 89.

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).

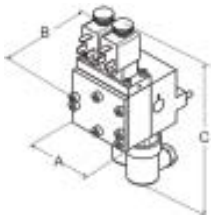
Series 35 SERPAR® Crossflow Double Valves

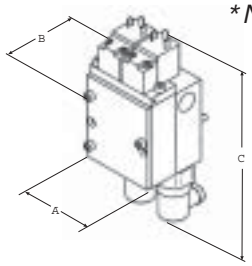
Size 1 & 2



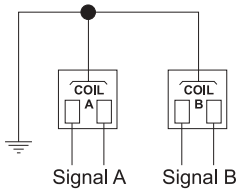
Crossflow Size 1

Crossflow Size 2





** Non-monitored*



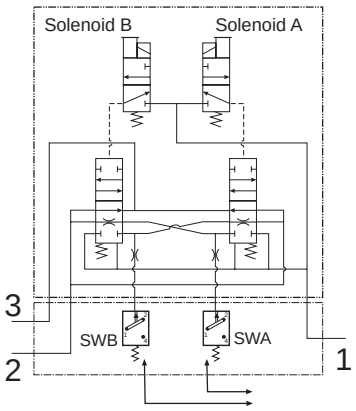
Valve Size	Valve Assembly Model Number*	Cv Rating 1-2	Cv Rating 2-3	Pressure Switches**	Press. Switch Provision	Port Sizes 1 & 2	Port Sizes 3	Dimensions inches (mm) A	Dimensions inches (mm) B	Dimensions inches (mm) C	Average Response Constants M	Average Response Constants F In-Out	Average Response Constants 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

These constants, designated M & 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:

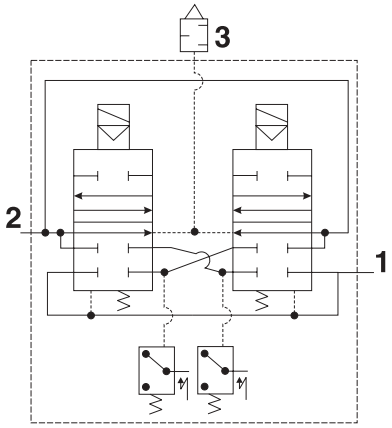
Valves without pressure switches must not be used to control clutch/brake mechanisms on press machinery. Valves with pressure switches must be used in conjunction with an external monitoring device to assist with OSHA compliance (Ref. 1910.217). The valves on this page do not have a built-in monitor,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

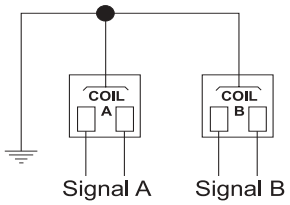
IMPORTANT NOTE
Please read carefully and thoroughly all of the **CAUTIONS** on page 89.

STANDARD SPECIFICATIONS:
Pilot Solenoids: Two, rated for continuous duty.
Standard Voltages: 100-110 volts 50 Hz; 100-120 volts 60 Hz; 24, 110 volts d.c. 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 d.c. *Size 2:* Each solenoid, 8.5 VA maximum inrush, 8.5 VA maximum holding on 50 or 60 Hz; 6 watts maximum on d.c.
Electrical Connections: Uses two cord-grip connectors at solenoids (order separately). *Size 2 connectors, see page 21. Size 1 Connectors: (specify solenoid voltage for options with light)* For use with dropcord (cord not included) 2 6 6 K 7 7 (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.

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 so must only be used in conjunction with an external monitoring system. Such monitoring system must be capable of inhibiting the operation of the valve and associated machinery in the event of a failure within the valve.

Size	Port Size	Model 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.

IMPORTANT NOTE
Please read carefully and thoroughly all of the **CAUTIONS** on page 89.

STANDARD SPECIFICATIONS:

Pilot Solenoids: Two, rated for continuous duty.

Standard Voltages: 24, 48, 110, 220 volts; 50/60 Hz; 24, 110 volts d.c. 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 d.c.

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).

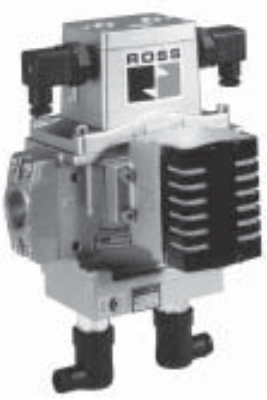
Media Temperature: 40° to 175° F (4° to 80° C).

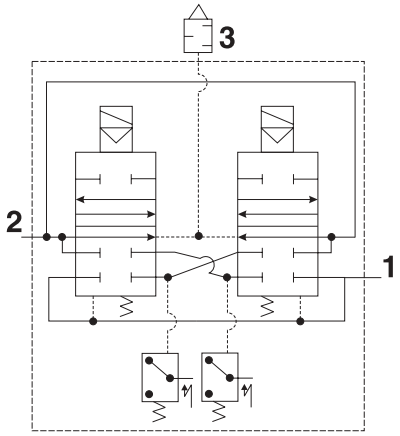
Enclosure Rating: IP 65 according to IEC-Publication 144 and DIN 40050, Sheet 1.

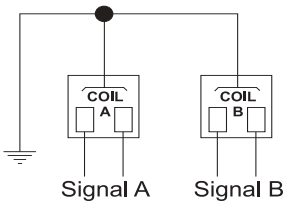
CAUTION: If the system must be reset, electrical signals to both solenoids must be removed to prevent the machine from immediately recycling and producing a potentially hazardous condition.

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.

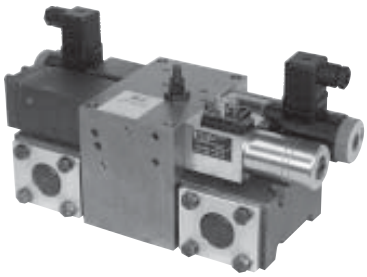
IMPORTANT NOTE
Please read carefully and thoroughly all of the **CAUTIONS** on page 89.

STANDARD SPECIFICATIONS:
Pilot Solenoids: Two, rated for continuous duty.
Standard Voltages: 24, 48, 110, 220 volts; 50/60 Hz; 24, 110 volts d.c. 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 d.c.
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.

Notes

Series IM - Hydraulic Double Valve

For Critical, Control Reliable Applications Self Contained Internal Monitor



The ROSS Series IM offers a unique solution for controlling hydraulic clutch and brakes, hydraulic shears, press brakes, hydraulic ram presses, rubber molding presses, energy isolation, and other critical applications. The general function of the Series IM hydraulic double valve (HDV) is that of a 3-way 2-position (3/2), internally monitored solenoid valve. The valve is actuated by energizing two solenoids in unison. The internal monitor will lock-out the valve and prevent further operation if the main valve spools do not shift in unison.

An optional pressure switch can be used to signal the system's main controls that a lock-out has occurred. All monitoring of valve performance is integrated internally. The all-inclusive design makes it ideal for control reliable upgrades.

FEATURES

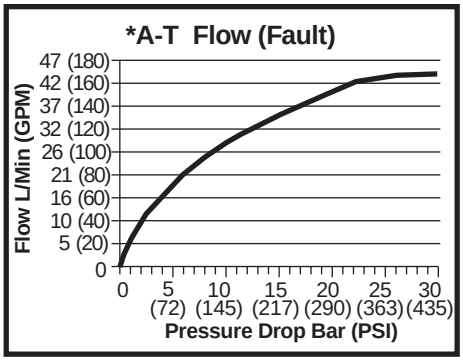
- Superior flow capabilities
- Multi-national patents pending
- 100% dynamic monitoring
- Automatic lockout upon detection of a fault
- Monitoring during actuation as well as de-actuation
- An independent, sole purpose, reset solenoid
- No accidental reset by removal of hydraulic pressure or electrical power
- Two (2) sizes, IM-12 and IM-20
- An adapter plate accessory which allows installation on an existing non-ROSS size 10 base

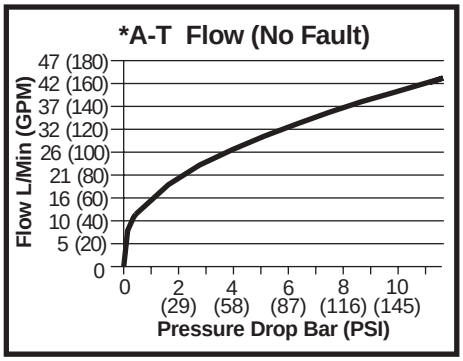
STANDARD SPECIFICATIONS:

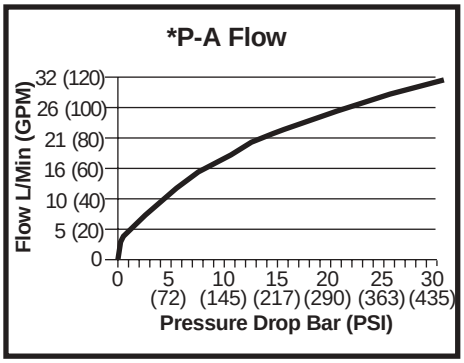
Operating Pressure: 220 psi (Min. 15 bar) - Max. 2,350 psi (160 bar).
Reset Type: Dedicated reset solenoid.
Fluid Type: Petroleum bases.
Recommended Filtration: 25 micron.
Seals: Buna.
Voltages: 110 50/60 or 24 VDC.
Inrush: AC = 58 VA DC = 18.6W.
Holding: AC = 30VA DC = 18.6W.
Electrical Connections: DIN connectors included.
Solenoid Connections: DIN 43650.
Fault and Lockout Indication Pressure Switch: Included.
Sub Base: Included.
Tank Line Shock Suppressor Option Available: Yes.
Physical Dimensions: See page 84.

Performance Graphs

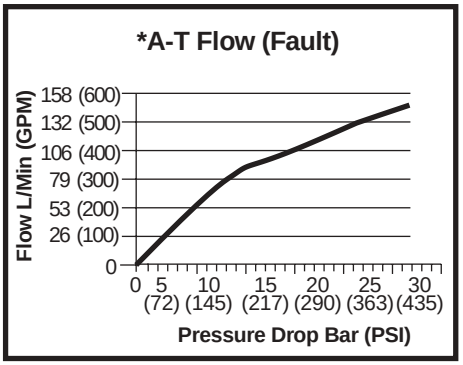
Series IM-12 Valve

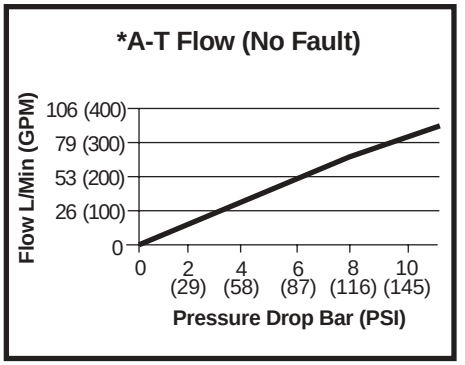


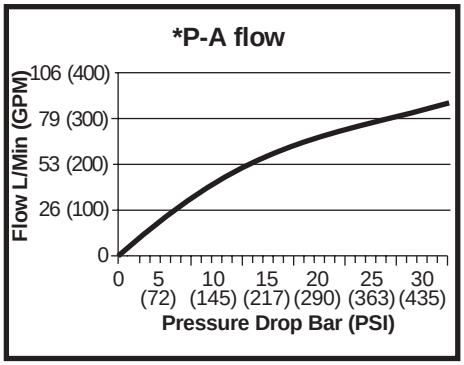




Series IM-20 Valve



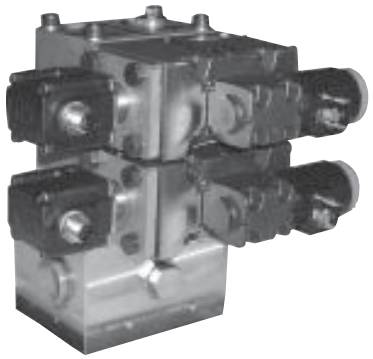




* P = Pressure — A = Actuator — T = Tank

Series EM - Hydraulic Double Valve

For Integration with an External, Control Reliable, Electrical Monitoring Circuit



The ROSS Series EM offers a solution for controlling hydraulic brakes and clutches as well as other critical applications on machinery. The general function of the Series EM hydraulic double valve (HDV) is that of a 3-way 2-position (3/2), solenoid valve. The valve is actuated by energizing two solenoids in unison. The valve will not allow flow to the work device if either main spool is not shifted. The Series EM HDV is equipped with spool position indicator switches which are designed to change state only when the valve flow capabilities change state.

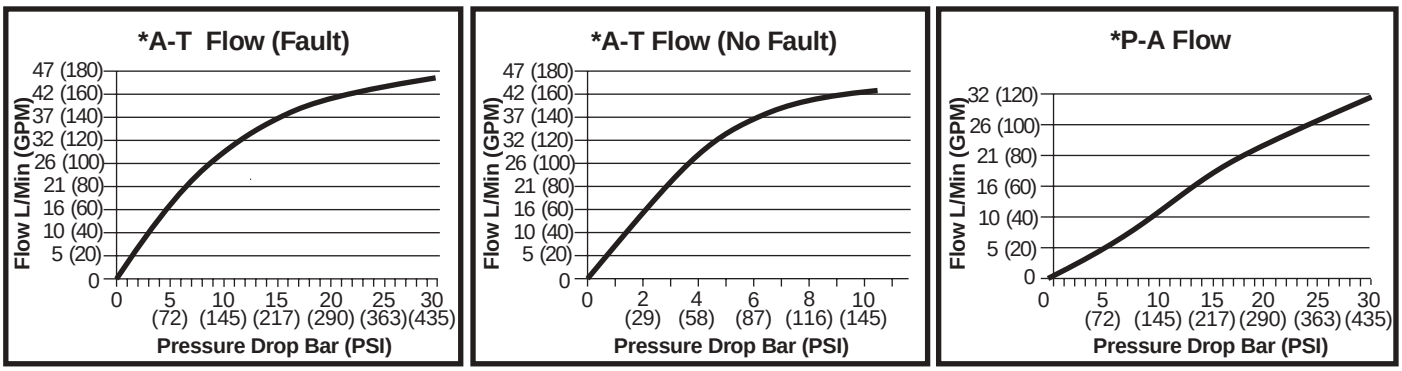
The spool position indicator switches must be integrated with a third party external monitoring system to meet regulatory safety requirements for control of clutch/brake mechanisms on stamping presses.

FEATURES:

- Superior flow capabilities
- Multi-national patents pending
- A control reliable hydraulic function goes to safe mode under fault conditions
- Electrical switch contacts for the shifted and un-shifted positions of both spools
- Integration into a 3rd party external monitoring system
- DIN connectors included
- Size EM-12

Performance Graphs

Series EM-12 Valve

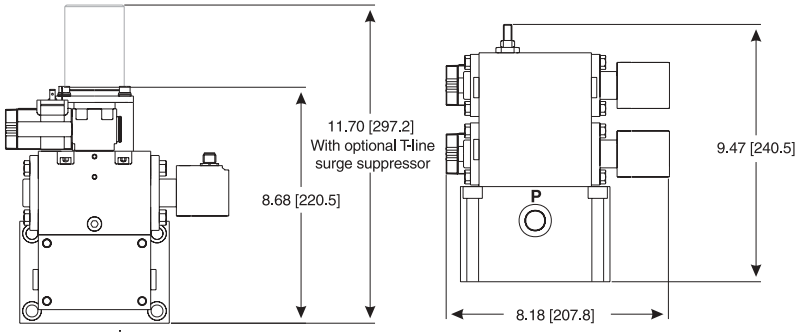


* P = Pressure — A = Actuator — T = Tank

Physical Dimensions

HDVEM12

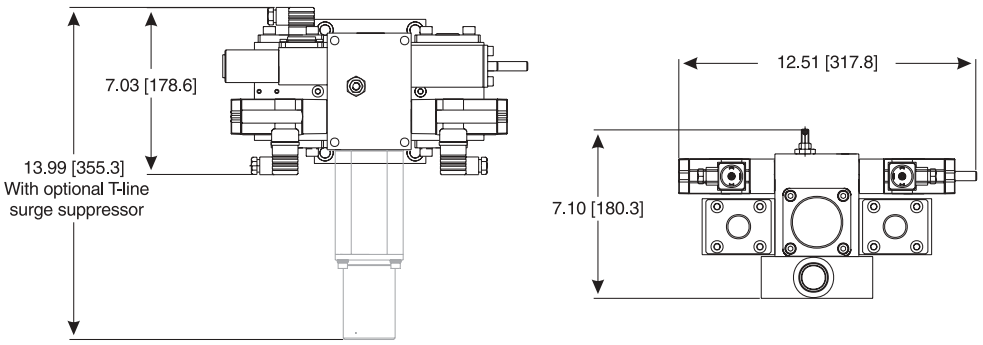
Dimensions inches [mm]



Physical Dimensions

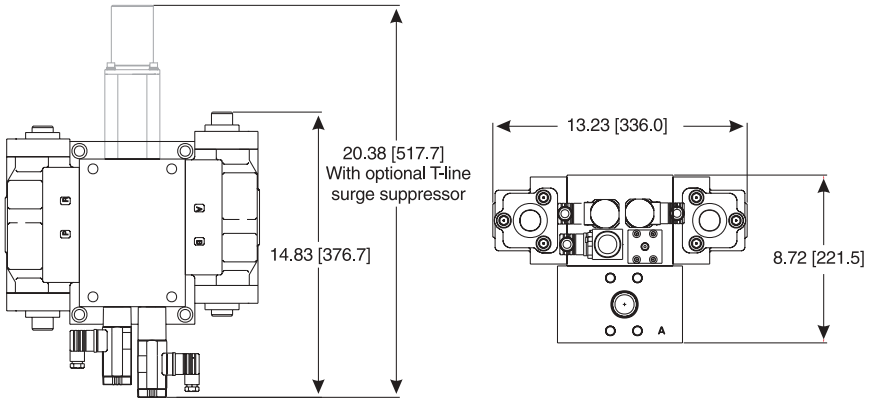
HDVIM12

Dimensions inches [mm]



HDVIM20

Dimensions inches [mm]



Ordering Information (Includes Base)

☐ = Fill in Selected Option

HDVIM12A	☐ VOLTAGE E = 110 50/60 W = 24VDC	**BC–**	☐ PRESSURE SWITCH P = INCLUDED N = NONE	☐ FLOW CONTROL F = INCLUDED N = NONE	☐ SURGE SUPPRESSOR S = INCLUDED N = NONE	☐ SUB-BASE* A = SAE 1/2, 1/2, 1/2 B = SAE 1/2, 3/4, 3/4 C = SAE 3/4, 1, 1 G = BSP 1/2, 1/2, 1/2 H = BSP 1/2, 3/4, 3/4 J = BSP 3/4, 1, 1 N = NONE	☐ SOFT BRAKE/CLUTCH E = 110V W = 24VDC N = NONE
Example: HDVIM12AEBC–PFSCE							
HDVIM20A	☐ VOLTAGE E = 110 50/60 W = 24VDC	**BC–**	☐ PRESSURE SWITCH P = INCLUDED N = NONE	**N**	☐ SURGE SUPPRESSOR S = INCLUDED N = NONE	☐ SUB-BASE** A = SAE #16 o-ring & #24 code 61 flange G = 1 BSP & 1-1/2 Code 61 Flange N = NONE	☐ SOFT BRAKE/CLUTCH CONSULT ROSS

All valves are shipped with mounting hardware included. Options are shipped loose for field installation.

* Port sizes listed above in this order: P = Pressure — A = Actuator — T = Tank

** All ports are the same size.

Hydraulic Double Valve Specifications

	Self-Monitoring Double Valve		Externally Monitorable Double Valve
Valve Type / Size	**IM-12**	**IM-20**	**EM-12**
Type Monitoring	100% dynamic internal		Customer Supplied Electrical
Reset Type	Discrete dedicated function solenoid		N/A
Possible False Reset by Removing Pressure	No		N/A
Possible False Reset by Removing Electric	No		N/A
Monitoring Directions	Energize and De-Energize		*Both Ends of Spool Travel
Type Mounting	Subplate (ROSS Interface)		
Connections	See Subplate Selections		
Mounting Position	Unlimited - No Restrictions		
Valve Function	3-Way Normally Closed		
Directions of Flow	P to A and A to T		
Weight (Valve Only)	37 lbs. (17 kg)	108 lbs. (49 kg)	30 lbs. (14 kg)
Ambient Temperature Range	-4°F to 122°F or -20°C to 50°C		
Max. Oper. Pressure (Standard)	2350 psi (160 Bar)		
Min. Oper. Pressure (Standard)	220 psi (15 Bar)		147 psi (10 Bar)
Fluid Temperature Range	50°F to 160°F (10 to 70°C)		
Fluid Type	Petroleum Based		
Fluid Viscosity Range (Kinematic)	100-300 mm^2/sec		
Flow Capabilities	Refer to Flow Charts		
Inlet Flow at 30 Bar Pressure Drop	31 GPM (118 Liters/Min.)	81 GPM (310 Liters/Min.)	29 GPM (112 Liters/Min.)
Return Flow Fault Mode at 20 Bar Pressure Drop	39 GPM (147 Liters/Min.)	116 GPM (440 Liters/Min.)	40 GPM (153 Liters/Min.)
Max. Return Flow without Malfunction	104 GPM Normal Mode (395 L/Min.) 75 GPM Fault Mode (285 L/Min.)	in Excess of 317 GPM (1200 Liters/Min.) in Excess of 237 GPM (900 Liters/Min.)	104 GPM Normal Mode (395 L/Min.) 75 GPM Fault Mode (285 L/Min.)
Internal Leakage – Valve Not Energized	0.01 in^3 (170mm^3/min @ 160 Bar) 0.03 in^3 (60mm^3/min @ 60 Bar)	0.12 in^3 (2000mm^3/min. @ 160 Bar) 0.045 in^3 (750mm^3/min. @ 60 Bar)	0.005 in^3 (90 mm^3/min. @ 160 Bar) 0.045 in^3 (750 mm^3/min. @ 60 Bar)
Internal Leakage – Valve Energized	0.026 in^3 (420mm^3/min @ 160 Bar) 0.006 in^3 (100mm^3/min @ 60 Bar)	0.12 in^3 (2000mm^3/min. @ 160 Bar) 0.045 in^3 (750mm^3/min. @ 60 Bar)	0.008 in^3 (130 mm^3/min. @ 160 Bar) 0.002 in^3 (30 mm^3/min. @ 60 Bar)
Valve Overlap	Positive		
Control Volume	0.14 in^3 (2.3 cm^3)	0.19 in^3 (3.2 cm^3)	0.18 in^3 (3.0 cm^3)
Recommended Filtration	25 Micron		
Seals	Buna (Standard)		
Rated Voltage	24 VDC or 110/50-60 VAC		
Inrush Solenoid Power	AC=58 VA DC=18.6 W		
Holding Power	AC=30 VA DC=18.6 W		
Switching Time On	DC=29 ms AC=19-28 ms	DC=33 ms AC=22-32 ms	DC=29 ms AC=19-28 ms
Switching Time Off	DC=10 ms AC=8-19 ms	DC=15 ms AC=13-24 ms	DC=10 ms AC=8-19 ms
Number of Switches Per Hour	AC=50,000 DC=60,000		
Duty Cycle	100%		
Electrical Connection (Solenoids)	DIN 43650		
Electrical Connection (Switches)	Din 43650	M12 x 1 (micro) 4 pin	
Solenoid Enclosure Rating	IP 64		
Pressure Switch Option	Yes		
Inlet Metering Valve Option	Yes		
T Line Shock Suppressor Option	Yes		
Soft Brake/Clutch Option	Yes	Consult Ross	

***NOTE:** The Series EM hydraulic double valves do not have a built-in monitor, therefore they must be used in conjunction with an external monitoring device to assist with regulatory safety requirements (OSHA, EN).

Hydraulic Double Valve Accessories

Adapter Plate

The adapter plate provides a convenient method of adding the ROSS Series IM-12 valve to an existing non-ROSS size 10 base. The adapter adds 1.4 inches [36 mm] to the stack height. Order Kit number S578A86.

Valve Options & Kit Numbers

(If Ordered Separately)

Inlet Flow Control

Reduces inlet flow rate for slower and gentler clutch engagement.

Kit 20582

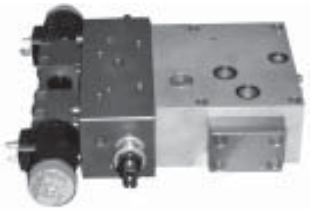
Tank Line Surge Suppressor

Reduces shock induced in the tank line due to high flow during stop function. Results in reduced noise and vibration, therefore, longer hose and fitting life.

Kit 91012.400

Soft Start-Stop (Brake/Clutch) Module — Series IM-12

A soft start-stop module (soft clutch brake) allows the selection of additional reduced pressures by energization of one of two solenoids. Some applications may require both solenoids be used to give a three step start. In the most typical application one solenoid is used for start and the other is used for stop, allowing a clutch to be softly started at one pressure and to brake softly at another. The unique patented design of this unit requires no additional monitoring to maintain control reliability as the hard stop function of the valve is always unopposed and available if required. Adds 2.4 inches [60 mm] to valve stack height. The inlet flow control (shown above) is included in this kit, as well as the mounting hardware and necessary plugs.



IM-12, 120 Volts, 60 Hz: Kit 75043
IM-12, 24 VDC: Kit 75042

Fault Indicator Pressure Switch — Series IM

Provides a method to signal the main controls that a fault has occurred within the Series IM valve and that it has locked out to prevent further operation.

Kit 32127.400

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)

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

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

Cautions

PRE-INSTALLATION or SERVICE

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

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

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

4. Each ROSS product should be used within its specification limits. In addition, use only ROSS parts to repair ROSS products. Failure to follow these directions can adversely affect the performance of the product or result in the potential for human injury.

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.

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

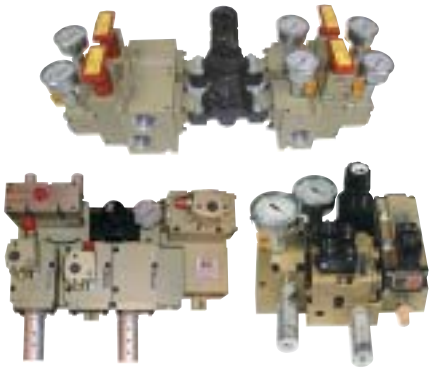
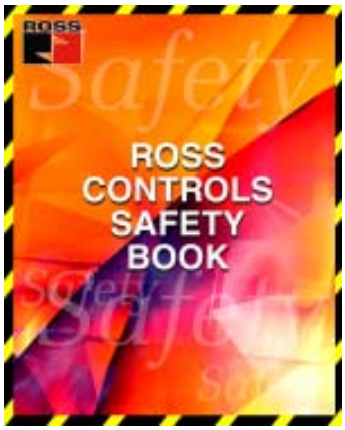
Products manufactured by ROSS are warranted to be free of defects in material and workmanship for a period of one year from the date of purchase. ROSS' obligation under this warranty is limited to repair or replacement of the product or refund of the purchase price paid solely at the discretion of ROSS 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.

Additional ROSS Catalogs

Visual Representation	Bulletin Number (If Applicable)	Description	ROSS Form Number
	440	ROSS Valves for Vacuum Service	A10122
	N/A	ENERGYSAVER™ Valve 5/2 Single & Double Solenoid Pilot Valve for ISO 55099/I	A10144
	451	ROSS Proportional Pressure Regulators	A10166
	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 System 32 I/O	A10175

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.

Additional ROSS Catalogs

Visual Representation	Bulletin Number (If Applicable)	Description	ROSS Form Number
	450	Modular Press Solutions	A10155
	462	Modular Pneumatic Solutions	A10181
	N/A	ROSS Controls Safety Book	A10264

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.

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There are ROSS Distributors Throughout the World

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

This catalog presents an overview of the extensive ROSS product line. Other literature is available for engineering, maintenance, and service requirements. If you need products or specifications not shown here, please contact ROSS or your ROSS distributor. They will be happy to assist you in selecting the best product for your application.

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