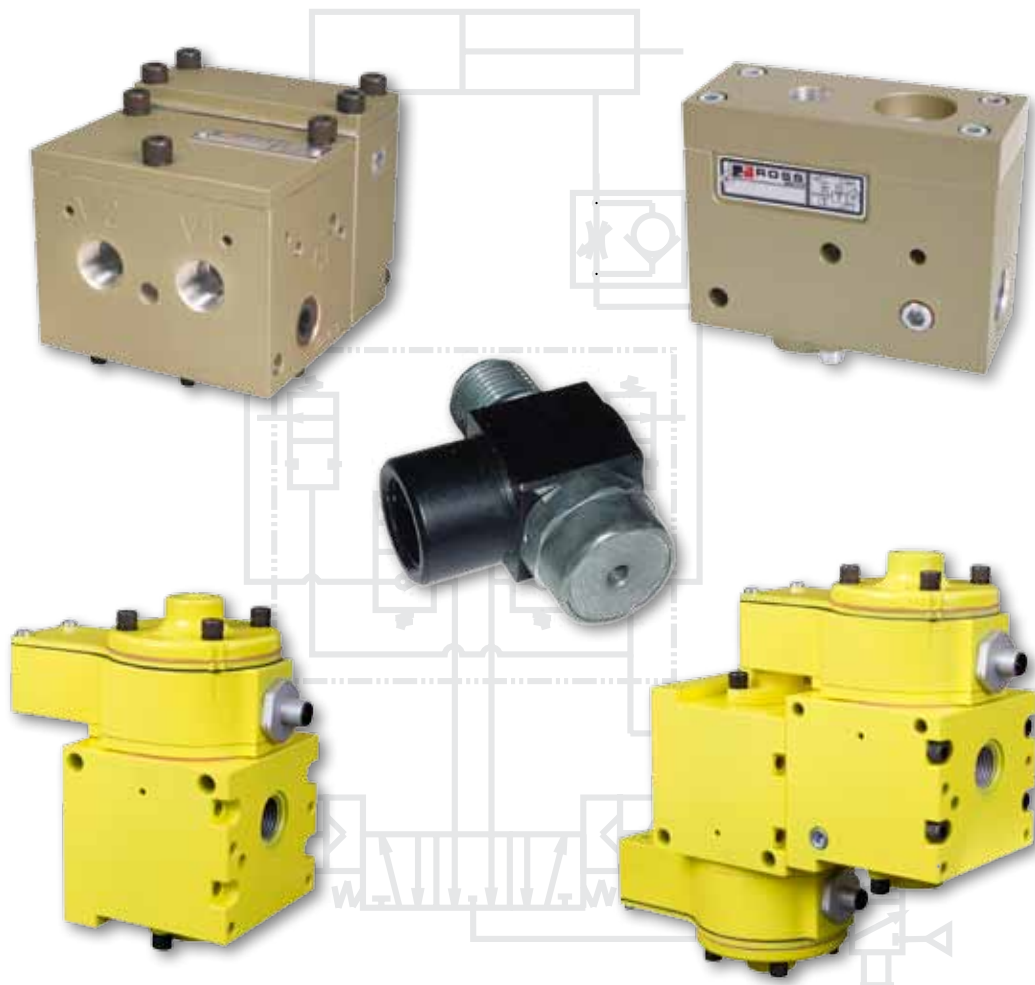


**Series
19, 27 and 5V27
Pilot Operated Check
Valves
and Their Applications**



• *Manufacturers of Premium Pneumatic Controls since 1921* •



Consider it **DONE!**

Series 27 Pilot Operated Check Valves

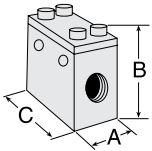


Single Pilot Operated Check Valve with trapped pressure relief illustrated

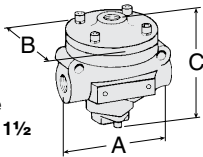
- Can be used wherever a high-flow or remotely-controlled checking function is needed.
- Can be used in a circuit to provide automatic stopping of a cylinder in the event of the loss of electrical or pneumatic power.
- Also available with an automatic exhausting function, remote and manual trapped pressure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

Pressure Controlled Pilot Operated Check Valves

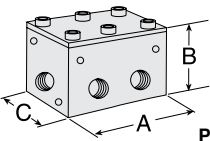
WITHOUT Trapped Pressure Relief Function



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



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



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

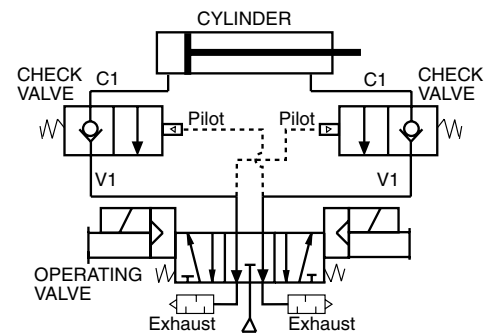
Valve Type	Port Size	Valve Model Number	Avg. C _V (Fully open)	Dimensions inches (mm)			Weight lb (kg)
				A	B	C	
A	1/4	2751A2908	2.2	1.5 (38)	3.6 (91)	2.0 (51)	2.3 (1.0)
	3/8	2751A3908	2.9	1.5 (38)	3.6 (91)	2.0 (51)	2.3 (1.0)
	1/2	2751A4915	3.2	1.5 (38)	3.6 (91)	2.5 (64)	2.3 (1.0)
B	1/4	2751A2903	2.3	3.6 (91)	3.8 (95)	3.1 (79)	1.3 (0.6)
	3/8	2751A3901	3.8	3.6 (91)	3.8 (95)	3.1 (79)	1.3 (0.6)
	1/2	2751A4902	4.0	3.6 (91)	3.8 (95)	3.1 (79)	1.3 (0.6)
B	1/2	2751A4905	7.7	4.6 (116)	4.4 (112)	3.1 (79)	2.3 (1.0)
	3/4	2751A5903	9.0	4.6 (116)	4.4 (112)	3.1 (79)	2.3 (1.0)
	1	2751A6901	9.0	4.6 (116)	4.4 (112)	3.1 (79)	2.3 (1.0)
	1	2751B6904	24	6.7 (169)	6.5 (165)	4.1 (104)	6.0 (2.7)
B	1 1/4	2751B7901	29	6.7 (169)	6.5 (165)	4.1 (104)	6.0 (2.7)
	1 1/2	2751B8902	29	6.7 (169)	6.5 (165)	4.1 (104)	6.0 (2.7)
	3/8	2768C3900	2.9	3.4 (89)	3.7 (94)	2.4 (61)	2.0 (0.9)
C Dual	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)

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

TYPICAL APPLICATION

In the schematic diagram at the right, two single PO check valves (Type A or B) are used in a typical cylinder circuit. Their function is to provide automatic stopping of the cylinder if either electrical or pneumatic power is lost. This circuit can also be used for jogging the cylinder as well as providing for an emergency stop.

In certain port sizes the two check valves could be replaced by just one Type C dual PO check valve. The dual PO check valve contains the functions of two individual checks in a single compact housing, and eliminates the need to connect externally the inlet of one check to the pilot of the other.



STANDARD SPECIFICATIONS: For valves on this page.

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

Flow Media: Filtered air; 5 micron recommended.

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

Signal Pressure: Must be equal to or greater than inlet.

Port Threads: NPT standard, BSPP. For BSPP threads add a "D" prefix to the model number, e.g., D2751A2908.

PIPING NOTE FOR TYPE B VALVES

Port 1 should be piped to the cylinder, and port 2 to the operating valve.

IMPORTANT NOTE: Please read carefully and thoroughly all of the **CAUTIONS** on page 11.

Pressure Controlled Pilot Operated Check Valves

WITH Trapped Pressure Relief Function

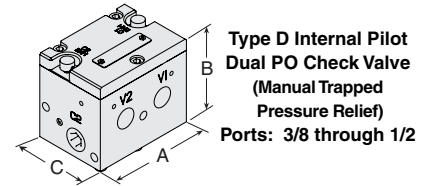
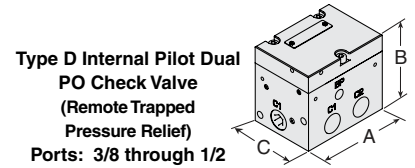
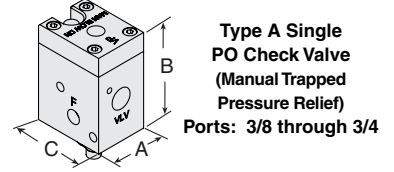
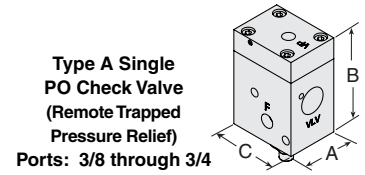
Air pilot or solenoid pilot operated check valves with trapped pressure relief can be used to control a pneumatic cylinder in several important ways. For example:

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

Correct installation of a dual check valve is essential. It should be mounted as close to the cylinder as possible. Minimizing the air volume by keeping the air lines short will reduce cylinder "bounce," and help to give the best performance.

Valve Type	Port Size	Valve Model Number	Avg. C _v (Fully open)	Dimensions inches (mm)			Weight lb (kg)
				A	B	C	
A Remote	3/8	2751B3922	2.6	1.65 (41.9)	3.57 (90.6)	2.2 (55.9)	1.8 (0.8)
	1/2	2751B4922	2.8	1.65 (41.9)	3.57 (90.6)	2.2 (55.9)	1.8 (0.8)
	3/4	2751B5917	9.2	4.3 (110)	4.2 (107)	2.2 (56)	2.9 (1.3)
A Manual	3/8	2751B3920	2.6	1.65 (41.9)	3.47 (88)	2.2 (55.9)	1.8 (0.8)
	1/2	2751B4920	2.8	1.65 (41.9)	3.47 (88)	2.2 (55.9)	1.8 (0.8)
	3/4	2751B5919	9.2	4.3 (110)	4.2 (107)	2.2 (56)	2.9 (1.3)
D Remote	3/8	2768D3901	2.9	3.6 (91.4)	3.64 (92.4)	2.6 (66.1)	3.5 (1.6)
	1/2	2768D4901	3.2	3.6 (91.4)	3.64 (92.4)	2.6 (66.1)	3.5 (1.6)
	3/4	2768D5901	8.5*	4.98 (126.5)	4.24 (107.7)	3.4 (86.4)	5.2 (2.3)
	1	2768D6901	8.5*	4.98 (126.9)	4.24 (107.7)	3.4 (86.4)	8.8 (4.0)
D Manual	3/8	2768D3904	2.9	3.6 (91.4)	3.6 (91.4)	2.6 (66.1)	3.2 (1.4)
	1/2	2768D4904	3.2	3.6 (91.4)	3.6 (91.4)	2.6 (66.1)	3.5 (1.6)
	3/4	2768D5904	8.5*	4.8 (122)	4.24 (107.7)	3.4 (86.4)	5.2 (2.3)
	1	2768D6904	8.5*	4.8 (122)	4.24 (107.7)	3.4 (86.4)	8.8 (4.0)

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

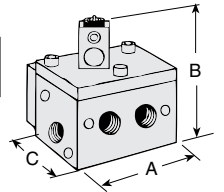


Solenoid Controlled Pilot Operated Check Valves

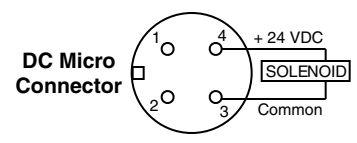
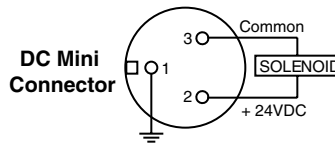
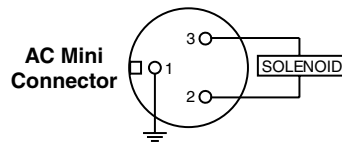
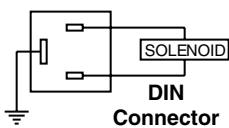
Valve Type	Port Size	Avg. C _v	DIN Connector	3-Pin Mini Connector	24 volts DC		Dimensions inches (mm)			Weight lb (kg)
					3-Pin Mini Connector	4-Pin Micro Connector	A	B	C	
E	3/8	2.9	2778C3900	2778C3901	2778C3902	2778C3904	3.60 (91.4)	5.67 (144)	2.60 (66.1)	4.0 (1.8)
	1/2	3.2	2778C4900	2778C4901	2778C4902	2778C4904	3.60 (91.4)	5.67 (144)	2.60 (66.1)	4.2 (1.9)
	3/4	8.5*	2778C5900	2778C5901	2778C5902	2778C5904	4.98 (126.5)	6.77 (172)	3.40 (86.4)	6.1 (2.8)
	1	8.5*	2778A6900	2778A6901	2778A6902	2778A6904	4.98 (126.5)	6.77 (172)	3.40 (86.4)	6.1 (2.8)

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

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



Connector Wiring



STANDARD SPECIFICATIONS: For valves on this page.

INTERNAL PILOT MODELS:

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

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

SOLENOID PILOT MODELS:

Solenoids: AC or DC power.

Standard Voltages: 100-110 volts, 50 Hz; 100-120 volts, 60 Hz; 24 volts DC; 3-pin Mini and 4-pin Micro connectors.

Power Consumption: 8 VA inrush, 6 VA holding on AC; on DC 4.5 watts with 4-pin Micro connector, 60 watts with 3-pin connector.

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

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

Flow Media: Filtered air; 5 micron recommended.

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

Signal Pressure: Must be equal to or greater than inlet.

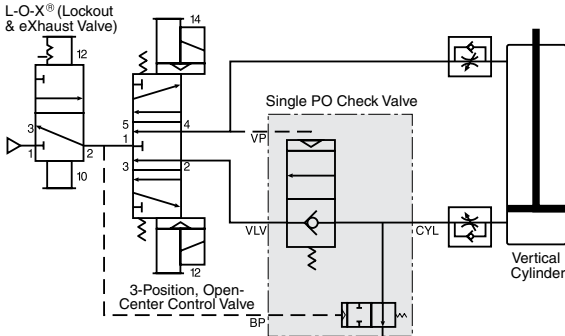
Port Threads: NPT standard, BSPP. For BSPP threads add a "D" prefix to the model number, e.g., D2778D3900.

Single Pressure Controlled PO Check Valve Application

TYPICAL APPLICATIONS:

Horizontal or vertical long-stroke cylinders.

With Trapped Pressure Relief



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

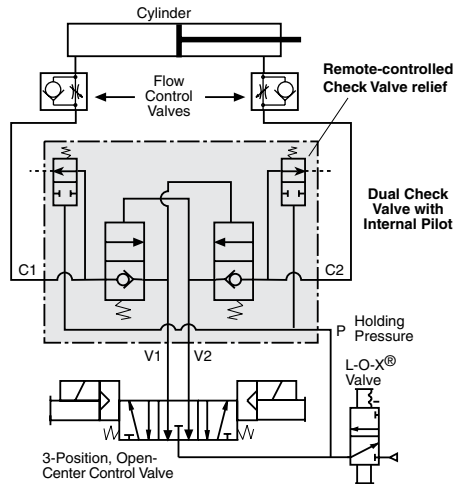
IMPORTANT NOTES and CAUTIONS:

- » 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.

Dual Internal Pressure Controlled PO Check Valve Applications

TYPICAL APPLICATIONS: Horizontal or vertical long-stroke cylinders.

Remote Trapped Pressure Relief



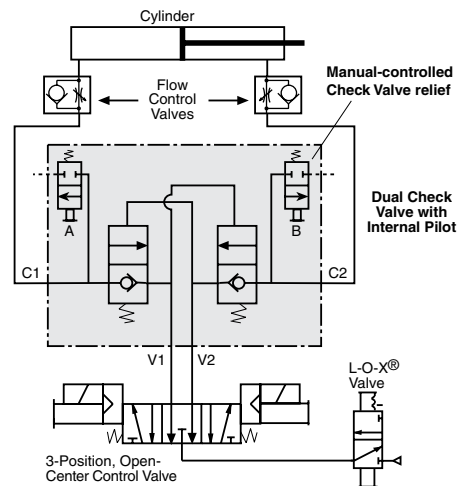
CIRCUIT FEATURES:

- Trapped pressure between check valve and cylinder is exhausted when the air supply at "P" port is lost or locked-out.
- Cylinder moves as long as a 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.
- L-O-X® valve provides lockable shutoff of air supply, and exhausting of trapped downstream air.

IMPORTANT NOTES and CAUTIONS:

- » Cylinder movement may occur when inlet pressure is lost. Its 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. See page 5 for soft-startup circuit.

Manual Trapped Pressure Relief



CIRCUIT FEATURES:

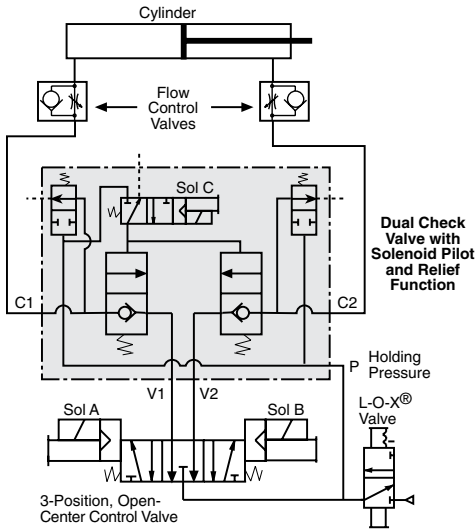
- Trapped pressure between check valve and cylinder is exhausted when pushbuttons A and B are pressed.
- Cylinder moves as long as a control valve solenoid is energized. Use for continuous motion or jogging.
- Cylinder remains stationary if neither control valve solenoid is energized, or if electrical signal is lost.
- L-O-X® valve provides lockable shutoff of air supply.

IMPORTANT NOTES and CAUTIONS:

- » Cylinder movement may occur if only one pushbutton (A or B) is pressed. To exhaust fully both cylinder ports, push and hold A and B simultaneously.
- » 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. See page 5 for soft-startup circuit.

NOTE: See *Installation and Troubleshooting* on page 6.

Dual Solenoid Controlled PO Check Valve Application



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

CIRCUIT FEATURES:

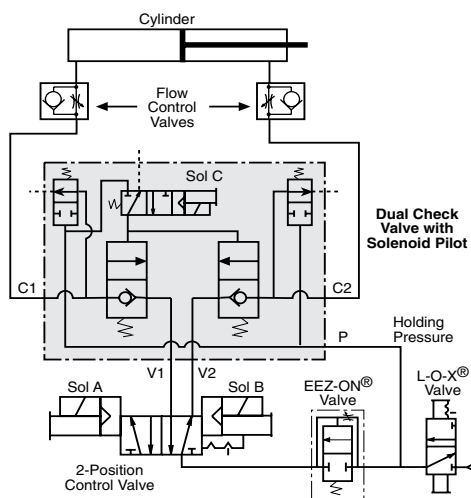
- To operate cylinder, simultaneously energize solenoids A and C or B and C.
- Pilot supply and exhaust are independent of control valve. Response time is not affected by exhaust restrictions of the control valve.
- Cylinder remains stationary if neither control valve solenoid is energized, or if electrical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

IMPORTANT NOTES and CAUTIONS:

- » Cylinder movement may occur when inlet pressure is lost. Its movement is slowed only by the restrictions of the flow control valves, and by the exhaust capacity of the check valve relief flow capacity.
- » The solenoid of the check valve must be wired so that it is energized whenever either control valve solenoid is energized.
- » 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. See below for soft-startup circuit.

Dual PO Check Valve Applications with EEZ-ON® Valve for Soft Startup

With 2-Position Control Valve



TYPICAL APPLICATIONS:

Shuttle and lifter circuits; applications where there is a long distance between the check valve and the operating valve; applications where gradual cylinder movement upon pressurization is acceptable.

CIRCUIT FEATURES:

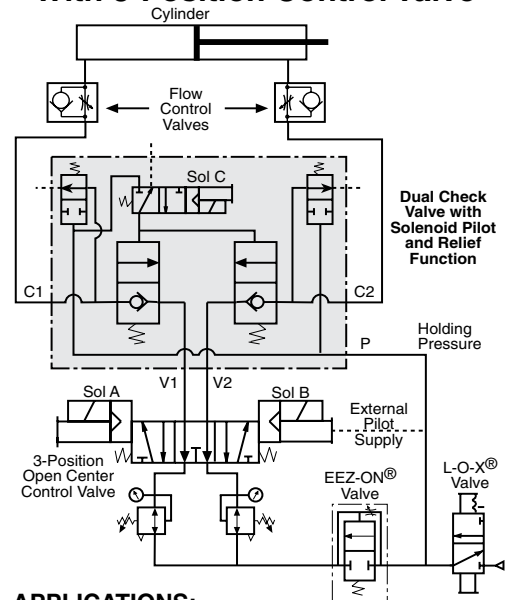
- Cylinder will remain fully extended or retracted if electrical signal to control valve solenoid is lost.
- Pressure in the cylinder is exhausted when the air supply at “P” port is lost or locked out.
- When the air supply is turned on, the EEZ-ON® valve (see page 6) allows slow pressurization of the system so that the cylinder moves slowly into the fully extended or retracted position.
- L-O-X® valve provides lockable shutoff of air supply, and exhausting of trapped downstream air.

IMPORTANT NOTES and CAUTIONS:

- » For cylinder to move, energizing of solenoids A and C or B and C must occur simultaneously.

NOTE: See *Installation and Troubleshooting* on page 6.

With 3-Position Control Valve



TYPICAL APPLICATIONS:

Shuttle and lifter circuits; applications where cylinder movement upon pressurization is *NOT* acceptable.

CIRCUIT FEATURES:

- Regulators are set to compensate for differing areas on either side of cylinder piston. Provides a steady startup and a gradual stopping of the cylinder.
- When the air supply is turned on, the EEZ-ON® valve (see page 6) allows pressure to build up on both sides of the piston. This minimizes startup “bounce.”
- Pilot operated check valve prevents drifting, and can be close-coupled to cylinder to reduce “bounce.”
- Pressure in the cylinder is exhausted when the air supply at “P” port is lost or locked out.
- L-O-X® valve provides lockable shutoff of air supply, and exhausting of trapped downstream air.

IMPORTANT NOTES and CAUTIONS:

- » For cylinder to move, energizing of solenoids A and C or B and C must occur simultaneously.

Installation and Troubleshooting

INSTALLATION

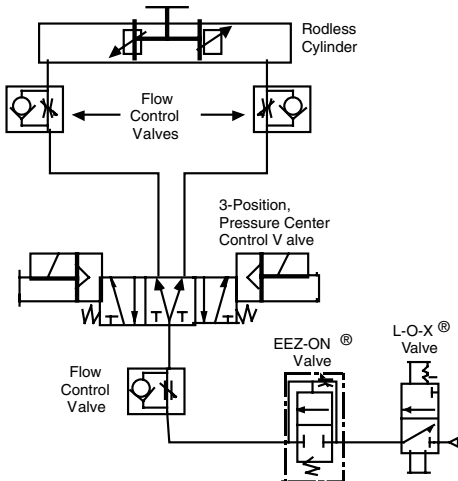
- Locate the check valve as close to the cylinder as possible. This will minimize cylinder bounce and drift.
- Use non-expandable hose between check valve and cylinder. The expandability of thin-wall flexible hose can magnify cylinder bounce and drift.
- To install threaded pipe or fittings, engage threads 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 P 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.
- In a circuit using a solenoid pilot check valve, the check valve solenoid and a control valve solenoid must be energized simultaneously.

TROUBLESHOOTING TIP

The most common cause of unsatisfactory performance is leaky connections. Always check for leaks with before undertaking any other repair procedures.

Circuit for Control of Rodless Actuators



TYPICAL APPLICATIONS: Control of rodless cylinders, double-rod cylinders, air motors on transfer systems, and part loaders.

CIRCUIT FEATURES:

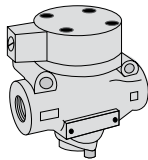
- When the air supply is turned on, the EEZ-ON® valve (see below) slowly pressurizes the cylinder to provide soft start recharging.
- Allows cylinder to be jogged in either direction.
- L-O-X® valve (see below) provides lockable shutoff of supply air, and exhausting of trapped downstream air.
- Prevents runaways due to loss of air pressure.

Other ROSS Valves Used in the Circuits

EEZ-ON® Valves

An EEZ-ON® valve allows a gradual buildup of downstream air pressure after the supply is turned on. Rate of buildup is adjustable. This controlled action lets cylinders move slowly and more safely into normal working positions.

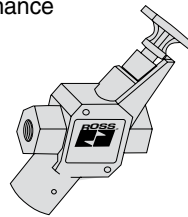
A 3/2 EEZ-ON® valve which has a shutoff-and-exhaust feature is also available.



L-O-X® Valves

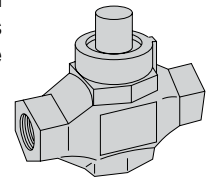
A ROSS L-O-X® valve is an energy isolation valve, generally the first valve in the air supply line. Air can be shut off with a push of the red handle, and downstream air is exhausted at the same time. For safety, the handle should be padlocked in the closed position when system maintenance is being performed.

The manually controlled L-O-X® valve is shown here, but piloted models to control the flow of air remotely are also available.



Flow Control Valves

A ROSS flow control valve provides a high air flow rate into a cylinder, and a precisely controlled flow rate out of the cylinder. The adjustable flow can range from near zero to full flow. A non-rising adjustment knob turns clockwise to reduce controlled flow. Flow control valves in other configurations are also available from ROSS.



Port Size	2/2 Model Number	Avg. C _v
1/4	2781A2007	2.3
3/8	2781A3007	3.8
1/2	2781A4017	4.0
1/2	2781A4007	7.7
3/4	2781A5007	9.0
1	2781A6017	9.0
1	2781A6007	24
1 1/4	2781A7007	29
1 1/2	2781A8017	29

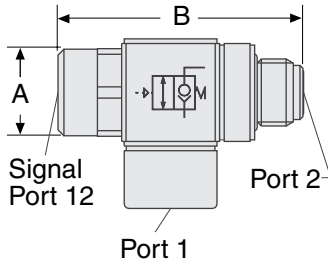
Port Sizes		L-O-X® Valve Model Numbers	Avg. C _v	
In-Out	Exh.		In-Out	Out-Exh
1/4	1/4	Y1523C2002	1.9	1.9
3/8	3/8	Y1523C3012	2.5	2.6
3/8	3/4	Y1523C3002	6.0	8.0
1/2	3/4	Y1523C4002	7.1	8.3
3/4	3/4	Y1523C5012	8.6	9.5
3/4	1 1/4	Y1523C5002	13	12
1	1 1/4	Y1523C6002	13	14
1 1/4	1 1/4	Y1523C7012	20	14
1 1/2	2	Y1523C8002	38	47
2	2	Y1523C9012	38	47

Port Size	Flow Control Model Numbers	Avg. C _v (Fully open)
1/4	1968E2007	2.3
3/8	1968E3007	2.6
1/2	1968E4007	7.5
3/4	1968E5007	8.3
1	1968E6007	17
1 1/4	1968E7007	22

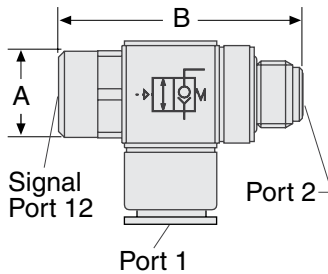
Series 19 Right-Angle Pilot Operated Check Valves

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 models with threaded Banjo are designed for easy positioning of pipe or tubing.



Threaded Banjo



Push-to-Connect Fitting

Models with Threaded Banjo

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

* Threads in port 1 are female.

** Port 2 threads are male.

Models with Push-to-Connect Fitting

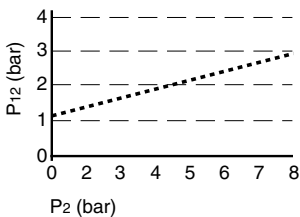
Port Size		Valve Model Number	Avg. C _v		Dimensions inches (mm)		Tightening Torque Max. Ft-lb (Nm)
Port 1* (tube size)	Port 2** (thread size)		1 to 2	2 to 1	A	B	
5/32"	1/8	1958A1115	0.4	0.4	0.5 (13)	1.7 (41)	11.06 (15)
1/4"	1/8	1958A1120	0.4	0.4	0.5 (13)	1.7 (41)	11.06 (15)
1/4"	1/4	1958A2120	0.8	0.7	0.7 (17)	1.9 (48)	14.75 (20)
3/8"	1/4	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)
4 mm	G1/8	D1958A1140	0.4	0.4	0.5 (13)	1.7 (41)	7.38 (10)
6 mm	G1/8	D1958A1160	0.4	0.4	0.5 (13)	1.7 (41)	7.38 (10)
8 mm	G1/8	D1958A1180	0.4	0.4	0.5 (13)	1.7 (41)	7.38 (10)
6 mm	G1/4	D1958A2160	0.8	0.7	0.7 (17)	1.9 (48)	8.85 (12)
8 mm	G1/4	D1958A2180	0.8	0.7	0.7 (17)	1.9 (48)	8.85 (12)
10 mm	G1/4	D1958A2110	0.8	0.7	0.7 (17)	1.9 (48)	8.85 (12)
8 mm	G3/8	D1958A3180	1.2	1.3	0.9 (22)	2.2 (55)	14.75 (20)
10 mm	G3/8	D1958A3110	1.2	1.3	0.9 (22)	2.2 (55)	14.75 (20)

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

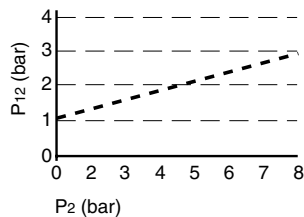
** Port 2 threads are male.

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

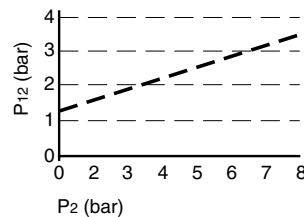
Signal Pressure: The charts below show the minimum signal pressure (P₁₂) to open the valve versus port 2 pressure (P₂) when there is no pressure at port 1 (P₁ = 0 bar).



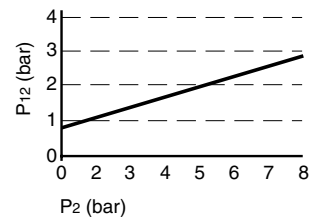
..... G1/8 - 1/8 NPTF



--- G1/4 - 1/4 NPTF



--- G3/8 - 3/8 NPTF



— G1/2 - 1/2 NPTF

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

IMPORTANT NOTE

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

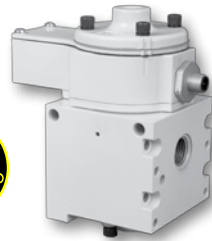


Series SV27 Pilot Operated Check Sensing Valves

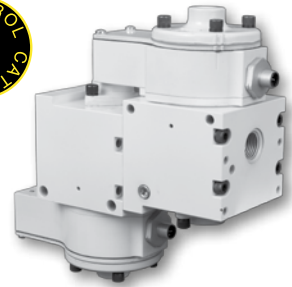
Position and State Sensing Feedback for Category 2 & 3 Safety Applications Load Holding



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



2/2 SV27 PO Check Pressure Controlled



2/2 Redundant SV27 PO Check Pressure Controlled

FEATURES:

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

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

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

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

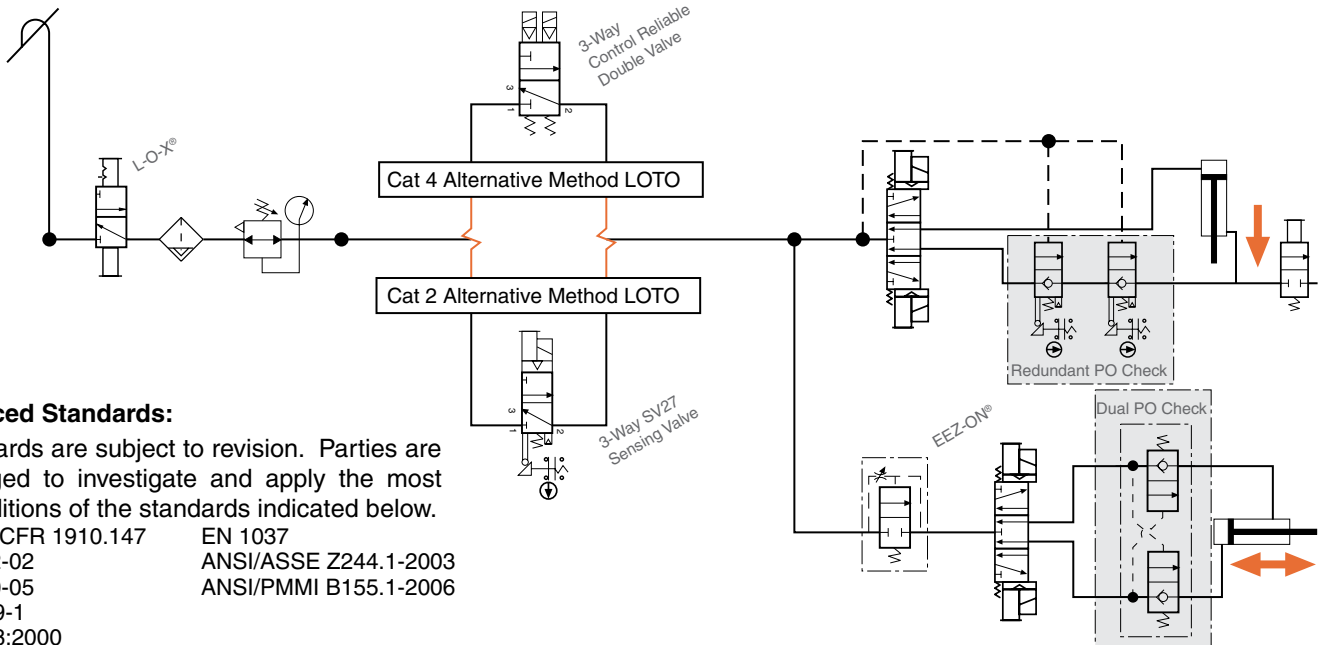
These new Sensing Valves are available in 2/2 normally closed (NC) functions with single or double solenoid pilot or pressure control actuation.

General Illustration Safety-Related Applications

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

ROSS Safety-Related Applications:

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



Referenced Standards:

All standards are subject to revision. Parties are encouraged to investigate and apply the most recent editions of the standards indicated below.

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

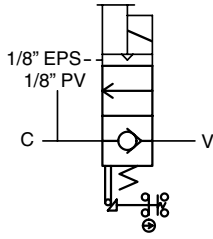
DISCLAIMER

These circuits are illustrative only and not intended to be used literally for your application. Each machine is unique and has individual characteristics that must be considered when designing a safety circuit. In addition, the referenced standards are not an exhaustive list. There may be many additional local, state, national, and international standards as well as machine function specific standards pertinent to your machine. This document is not a substitute for a complete risk assessment of a machine's hazards, professional circuit design or acquiring an in depth understanding of standards/regulations relevant to an application or machine.



Solenoid Pilot Controlled PO Check Sensing Valves

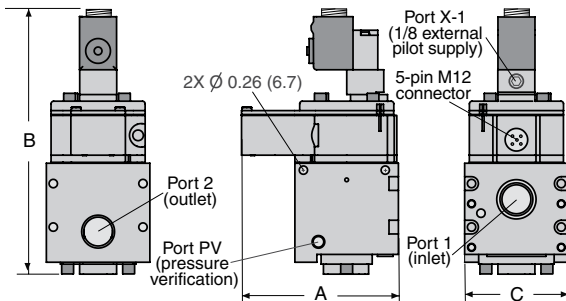
2/2 Valves



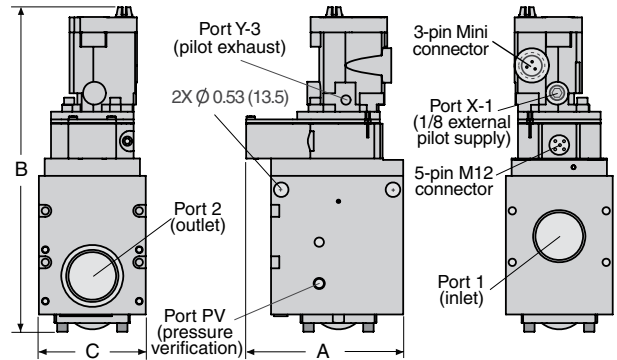
Port Size	Valve Model Numbers*	C _v 1 - 2	Dimensions inches (mm)			Weight lb (kg)
			A	B	C	
1/2	SV27NC115408CSAA1A**	4.5	5.0 (127)	8.5 (215)	3.3 (84)	5.0 (2.3)
3/4	SV27NC115508CSAA1A**	8.3	5.0 (127)	8.5 (215)	3.3 (84)	5.0 (2.3)
1	SV27NC115608CSAA1A**	10.3	5.0 (127)	8.5 (215)	3.3 (84)	5.0 (2.3)
1	SV27NC117608CSAA1A**	20	5.7 (145)	11.8 (299)	3.8 (99)	12.5 (5.6)
1¼	SV27NC117708CSAA1A**	29	5.7 (145)	11.8 (299)	3.8 (99)	12.5 (5.6)
1½	SV27NC117808CSAA1A**	33	5.7 (145)	11.8 (299)	3.8 (99)	12.5 (5.6)

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

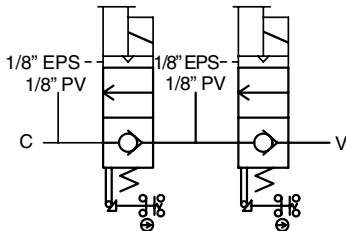
Solenoid Pilot Controlled Model (CNOMO Style)



Solenoid Pilot Controlled Model (Pacer Style)



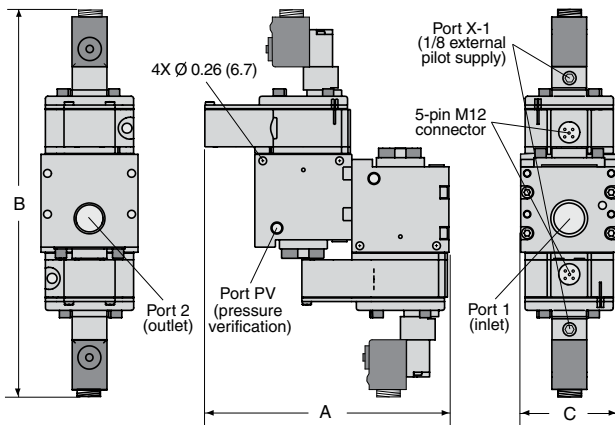
2/2 Valves Redundant



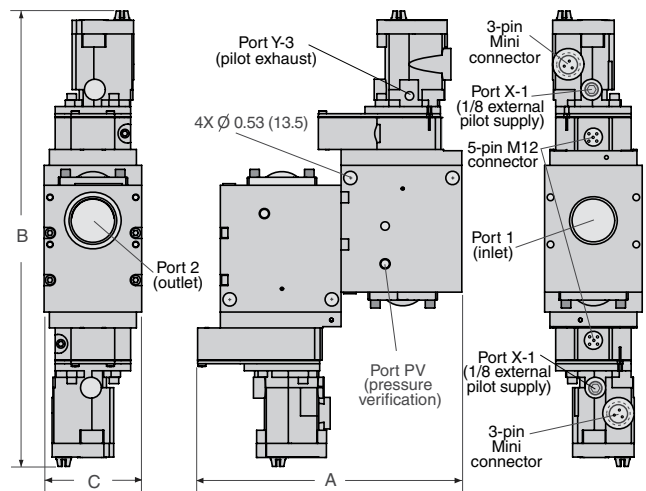
Port Size	Valve Model Numbers*	C _v 1 - 2	Dimensions inches (mm)			Weight lb (kg)
			A	B	C	
1/2	SV27NC555408CSAA1A**	3.8	8.3 (211)	13.2 (335)	3.3 (84)	10.0 (4.5)
3/4	SV27NC555508CSAA1A**	5.6	8.3 (211)	13.2 (335)	3.3 (84)	10.0 (4.5)
1	SV27NC555608CSAA1A**	8	8.3 (211)	13.2 (335)	3.3 (84)	10.0 (4.5)
1	SV27NC557608CSAA1A**	12	10.5 (267)	18.1 (459)	3.9 (99)	25.0 (11.3)
1¼	SV27NC557708CSAA1A**	19	10.5 (267)	18.1 (459)	3.9 (99)	25.0 (11.3)
1½	SV27NC557808CSAA1A**	22	10.5 (267)	18.1 (459)	3.9 (99)	25.0 (11.3)

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

Solenoid Pilot Controlled Model (CNOMO Style)



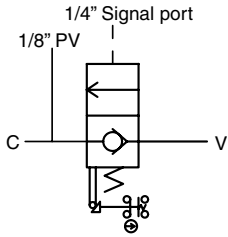
Solenoid Pilot Controlled Model (Pacer Style)



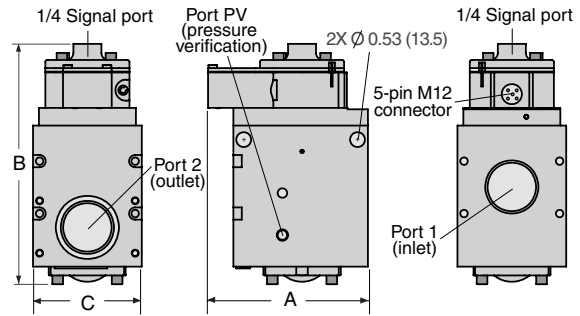
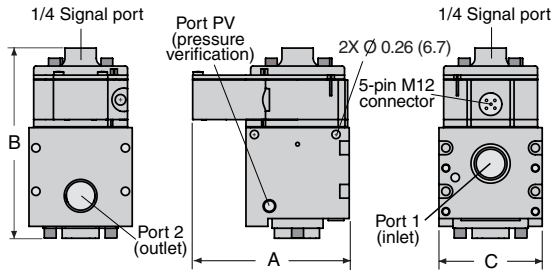
STANDARD SPECIFICATIONS: See page 10.

Pressure Controlled PO Check Sensing Valves

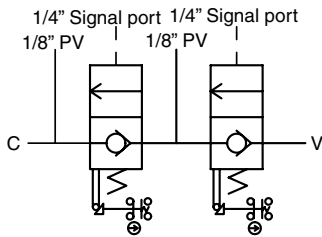
2/2 Valves



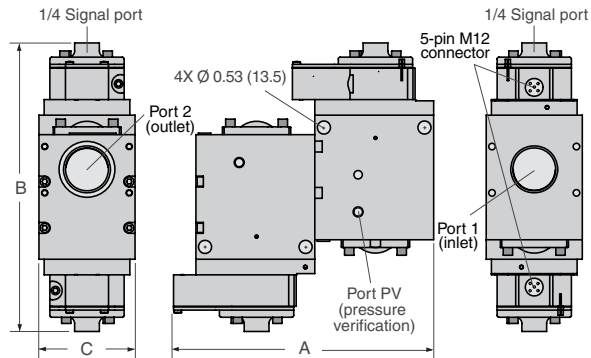
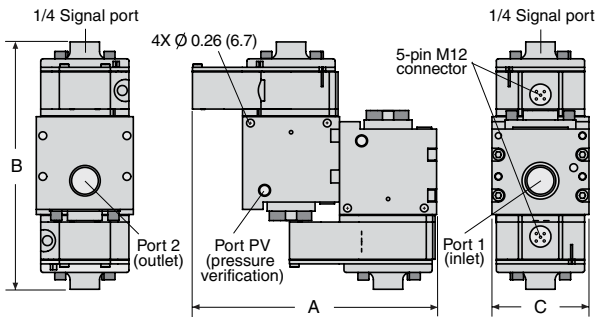
Port Size	Valve Model Numbers*	C _v 1 - 2	Dimensions inches (mm)			Weight lb (kg)
			A	B	C	
1/2	SV27NC115405ASAA	4.5	5.0 (127)	6.1 (154)	3.3 (84)	4.0 (1.8)
3/4	SV27NC115505ASAA	8.3	5.0 (127)	6.1 (154)	3.3 (84)	4.0 (1.8)
1	SV27NC115605ASAA	10.3	5.0 (127)	6.1 (154)	3.3 (84)	4.0 (1.8)
1	SV27NC117605ASAA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



2/2 Valves Redundant



Port Size	Valve Model Numbers*	C _v 1 - 2	Dimensions inches (mm)			Weight lb (kg)
			A	B	C	
1/2	SV27NC555405ASAA	3.8	8.3 (211)	8.5 (214)	3.3 (84)	9.0 (4.1)
3/4	SV27NC555505ASAA	5.6	8.3 (211)	8.5 (214)	3.3 (84)	9.0 (4.1)
1	SV27NC555605ASAA	8	8.3 (211)	8.5 (214)	3.3 (84)	9.0 (4.1)
1	SV27NC557605ASAA	12	10.5 (267)	11.7 (296)	3.5 (88)	22.0 (10.0)
1 1/4	SV27NC557705ASAA	19	10.5 (267)	11.7 (296)	3.5 (88)	22.0 (10.0)
1 1/2	SV27NC557805ASAA	22	10.5 (267)	11.7 (296)	3.5 (88)	22.0 (10.0)



STANDARD SPECIFICATIONS: For valves on this page and page 9.

Solenoid: AC or DC power. Rated for continuous duty.

Standard Voltages: 120 volts AC, 60 Hz; 240 volts AC, 60 Hz; 24 volts AC, 60 Hz; 24 volts DC. For other voltages, consult ROSS.

Power Consumption: *CNOMO Style:* 11 VA inrush, 8.5 VA holding on 50 or 60 Hz; 6 watts on DC. *Pacer Style:* 87 VA inrush, 30 VA holding on 50 or 60 Hz; 14 watts on DC.

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

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

Flow Media: Filtered air; 5 micron recommended.

Inlet Pressure: 40 to 150 psig (2.8 to 10 bar).

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

Switch Current/Voltage Max.: 2.5 A/120 volts AC.

Switch Current/Voltage Min.: 50 mA/24 volts DC.

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

Port Treads: NPT standard. For BSPP threads, replace "N" in the model number with a "D", e.g. SV27DC115408CSAA1A.

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



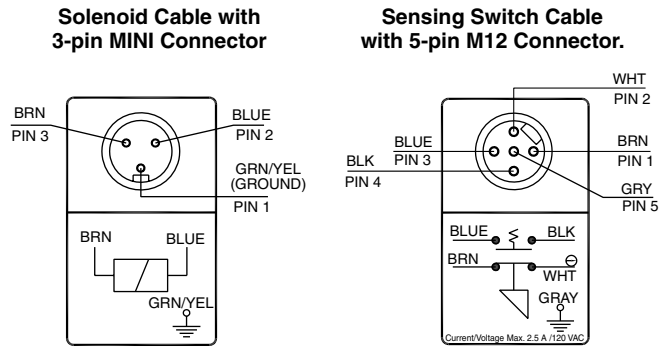
Preassembled Wiring Kits for Series SV27 Sensing PO Check Valves

Wiring Kits

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

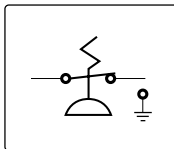
For SV27 Redundant PO Check valves (CAT 3), order 2 kits.

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



Optional Pressure Switch Kit (608A86)

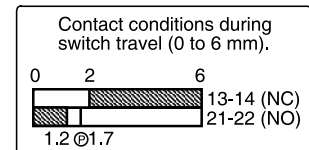
Schematic



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

Integrated Double-Pole Single-Throw Switch (DPST)

Switch States



Cautions

PRE-INSTALLATION or SERVICE

- 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).
- 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.
- 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.
- 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

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

7. Only use lubricants which are compatible with materials used in the valves and other components in the system. Normally, compatible lubricants are petroleum base oils with oxidation inhibitors, an aniline point between 180°F (82°C) and 220°F (104°C), and an ISO 32, or lighter, viscosity. Avoid oils with phosphate type additives which can harm polyurethane components, potentially leading to valve failure and/or human injury. If you have questions regarding whether a lubricant used on your system is compatible with ROSS products, please contact ROSS.

AVOID INTAKE/EXHAUST RESTRICTION

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

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

POWER PRESSES

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

ENERGY ISOLATION/EMERGENCY STOP

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

Warranty: ROSS warranty apply, available upon request or at www.rosscontrols.com.





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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.