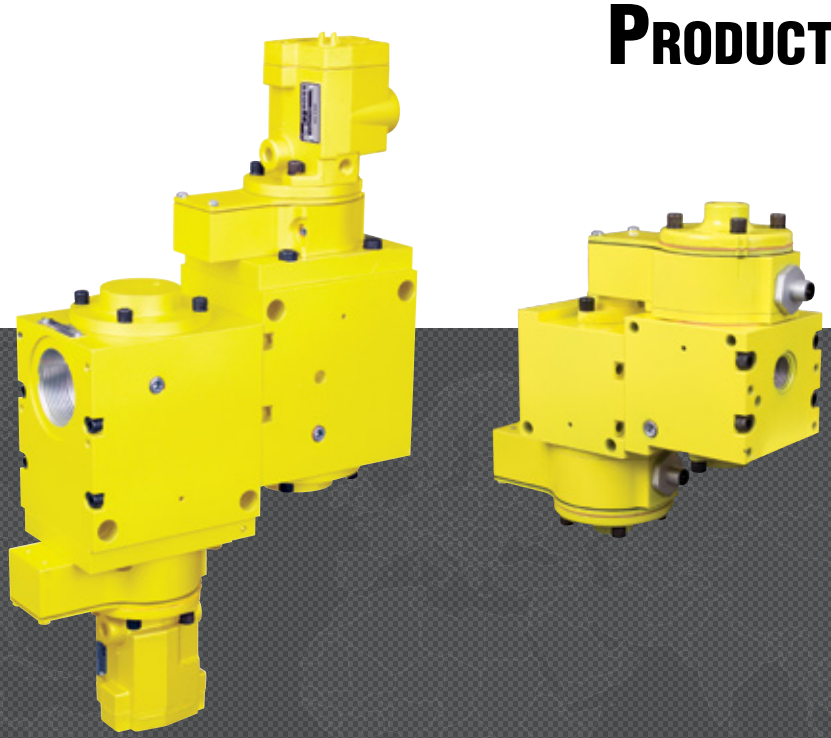
Safe Load Holding PO Check Sensing Valves

SV27 Series

Product Catalog



ROSS™
a global family

Safe Load Holding PO Check Sensing Valves SV27 Series
Product Overview

Sensing Safety Function

The SV27 Series Sensing Valve uses a safety-rated DPST (Double-Pole Single-Throw) switch to monitor the valve's operating position. The SV27 3/2 valve can be used for safe shut-off and exhaust functions for Category 2 applications with proper integration and monitoring. The feedback switch informs the controls that the valve internals have shifted properly.

Single (CAT-2 / PL c)		Redundant (CAT-3 / PL e)	
Solenoid Pilot Controlled	Pressure Controlled	Solenoid Pilot Controlled	Pressure Controlled
			

Illustration examples.

Pilot Operated Check valves are designed to trap pressure in order to hold a cylinder in place when a safety event occurs. The SV27 Series Sensing Valve uses a safety-rated DPST switch to monitor the valve's operating position. The SV27 PO Check valves can be used for load holding functions in Category 2 (single) or Category 3 (redundant) applications with proper integration and monitoring. The feedback switch informs the controls that the valve internals have shifted properly.

VALVE FEATURES	
Poppet Design	Dirt tolerant, wear compensating for quick response and high flow capacity Poppet construction for near zero leakage & dirt tolerance
Sensing	Senses internal position & state
Electrical Feedback	Electrical feedback via DPST switch (Double-Pole Single-Throw)
Locking Protection	Directly operated safety-rated force-guided positive-break status switch (DPST)
Diagnostic Coverage	A diagnostic coverage (DC) of up to 90% can be obtained by monitoring the safety switch status
Mounting	Inline
SISTEMA Library	Available for download

PRODUCT CREDENTIALS				
Performance Level Per ISO 13849-1:2015	**Safety Integrity Level** Per IEC 2061:2001	**TÜV Rheinland of North America Certificate**	**Declaration of Conformity**	**Certificate of Compliance**
Cat. 2 PL c Cat. 3 PL d	SIL 2 Functional Safety	TÜVRheinland® Precisely Right.	CE, UKCA, EAC	CSA® C US

Specifications

STANDARD SPECIFICATIONS					
GENERAL	Function		2/2 Valve, Single or Redundant		
	Construction Design		Poppet		
	Actuation		Electrical	Solenoid Pilot Controlled	
			Pneumatic	Pressure Controlled	
	Mounting	Type	Inline		
		Orientation	Any, preferably vertical		
	Connection		Threaded	NPT, G	
	Manual Override (Solenoid Pilot Controlled)		Pacer Style Pilot (only)		Flush; rubber, non-locking
	Minimum Operation Frequency		Once per month, to ensure proper function		
OPERATING CONDITIONS	Temperature	Ambient	40° to 120°F (4° to 50°C)		
		Media	40° to 175°F (4° to 80°C)		
	Flow Media		Filtered air		
	Operating Pressure		40 to 150 psig (2.8 to 10.3 bar)		
	Pilot Pressure		Must be equal to or greater than inlet pressure		
ELECTRICAL DATA	Switch Current/Voltage	Maximum	2.5 A, 120 volts AC		
		Minimum	50 mA, 24 volts DC		
	Switch Rating		Rated in excess of 15 million cycles; electrical life of switch varies with conditions and voltage		

ELECTRICAL DATA FOR SOLENOID PILOT CONTROLLED VALVES	Solenoids		Current Flow	Operating Voltage	Power Consumption (each solenoid)
	Body Size 3/4	CNOMO Style Pilot	DC	24 volts	6 watts
			AC	110-120 volts, 50/60 Hz	8.5 VA inrush, 30 VA holding
				230-240 volts, 60 Hz	
			Rated for continuous duty		
	Body Size 1-1/4	Pacer Style Pilot	DC	24 volts	14 watts
			AC	110-120 volts, 50/60 Hz	87 VA inrush, 30 VA holding
				230-240 volts, 60 Hz	
			Rated for continuous duty		

CONSTRUCTION MATERIAL		
	Valve Body	Cast Aluminum
	Poppet	Acetal and Stainless Steel
	Seals	Buna-N; Fluorocarbon

SAFETY DATA				
	Safety Integrity Level (SIL)	Certified by TÜV Rheinland in accordance to IEC 61508 and IEC 61511 safety integrity level 2 (SIL 2) and EN ISO 13849-1, PL c (with application specific diagnosis) in singular application with HFT = 0 and SIL 3 and PL e in redundant application with HFT≥1, for details see certificate.		
	Functional Safety Data	Category	Single	CAT 2, PL c
			Redundant	CAT 3, PL d
		B_{10D}		20,000,000
		PFH_D	Single	$2.35x10^{-7}$
			Redundant	$2.47x10^{-8}$
		$MTTF_D$	Single	98.15 (nop: 7360)
			Redundant	100 (nop: 7360)
		DC (obtained by monitoring safety switch status)		90%
		ROSS recommends testing the switch function and sealing for load holding valves every 8 hours.		
	Vibration/Impact Resistance	Calculated to DIN EN 60068-2-6.		

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

Ordering Information

Solenoid Pilot Controlled Valves

Model Number Configurator — 2-Way 2-Position Valves

SV27	N	C	11	540	8CS	AA	1A

Series

Port Thread

NPT	N
G	D

Revision Level

Valve Function

2/2 - Single (Cat-2)	11
2/2 - Redundant (Cat-3)	55

Body Size	Port Size In	Port Size Out	
3/4	1/2	1/2	540
	3/4	3/4	550
	1	1	560
1-1/4	1	1-1/2	760
	1-1/4	1-1/2	770
	1-1/2	1-1/2	780

Current	Voltage*	
DC	24 V	1D
AC	110 V, 50 Hz 120 V, 50/60 Hz	1A
	230 V, 50/60 Hz	2A

* For other voltages consult ROSS.

Mounting

Inline

Actuation

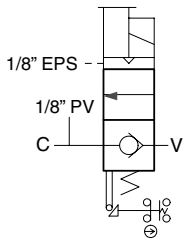
Solenoid Pilot

Model Number examples: SV27NC115508CSAA1D, SV27DC555508CSAA1A.

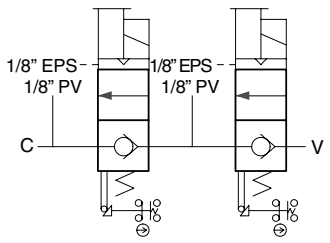
Function	Size Body	Port 1	Port 2	Flow Cv (Nl/min) 1-2	Weight lb (Kg)
Single	3/4	1/2	1/2	4.5 (4400)	5.0 (2.3)
		3/4	3/4	8.3 (8200)	
		1	1	10 (10000)	
	1-1/4	1	1	20 (20000)	12.5 (5.6)
		1-1/4	1-1/4	29 (29000)	
		1-1/2	1-1/2	33 (32000)	
Redundant	3/4	1/2	1/2	3.8 (3800)	10.0 (4.5)
		3/4	3/4	5.6 (5500)	
		1	1	8.0 (7900)	
	1-1/4	1	1	12 (12000)	25.0 (11.3)
		1-1/4	1-1/4	19 (19000)	
		1-1/2	1-1/2	22 (22000)	

Valve Schematic

Single



Redundant



Pressure Controlled Valves

Model Number Configurator — 2-Way 2-Position Valves

SV27	D	C	11	540	5AS	AA

Series

Port Thread

NPT	N
G	D

Revision Level

Valve Function

2/2 - Single (Cat-2)	11
2/2 - Redundant (Cat-3)	55

Mounting

Inline

Actuation

Pressure Controlled

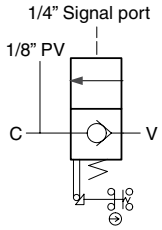
Body Size	Port Size		
	In	Out	
3/4	1/2	1/2	540
	3/4	3/4	550
	1	1	560
1-1/4	1	1-1/2	760
	1-1/4	1-1/2	770
	1-1/2	1-1/2	780

Model Number examples: SV27NC115405ASAA, SV27DC5557605ASAA.

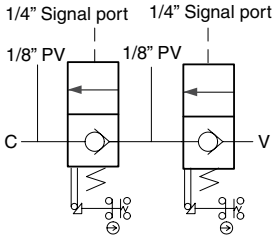
Function	Size			Flow C_v (Nl/min)	Weight lb (Kg)
	Body	Port 1	Port 2	1-2	
Single	3/4	1/2	1/2	4.5 (4400)	4.0 (1.8)
		3/4	3/4	8.3 (8200)	
		1	1	10 (10000)	
	1-1/4	1	1	20 (20000)	11.0 (5.0)
		1-1/4	1-1/4	29 (29000)	
		1-1/2	1-1/2	33 (32000)	
Redundant	3/4	1/2	1/2	3.8 (3800)	9.0 (4.1)
		3/4	3/4	5.6 (5500)	
		1	1	8.0 (7900)	
	1-1/4	1	1	12 (12000)	22.0 (10.0)
		1-1/4	1-1/4	19 (19000)	
		1-1/2	1-1/2	22 (22000)	

Valve Schematic

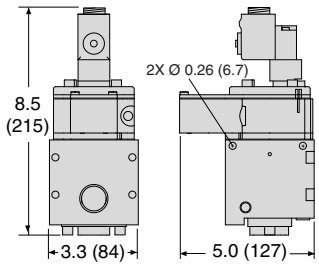
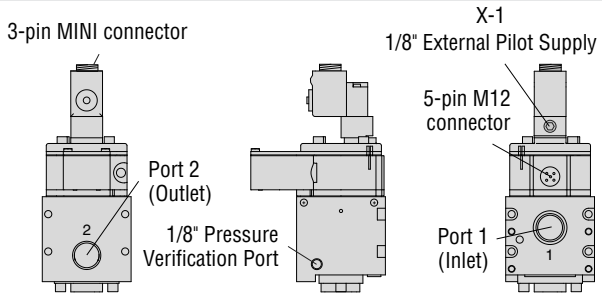
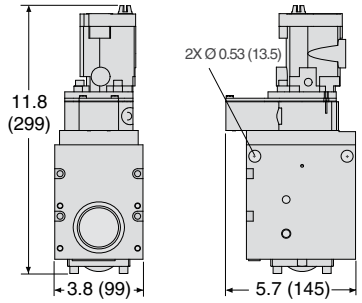
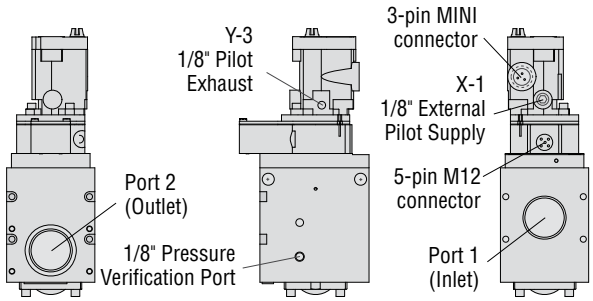
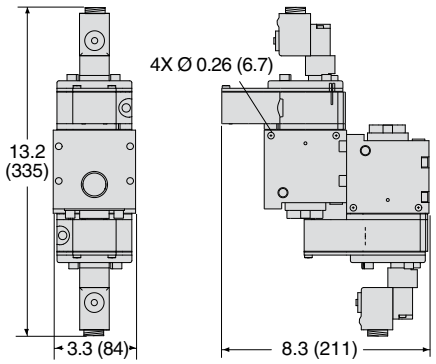
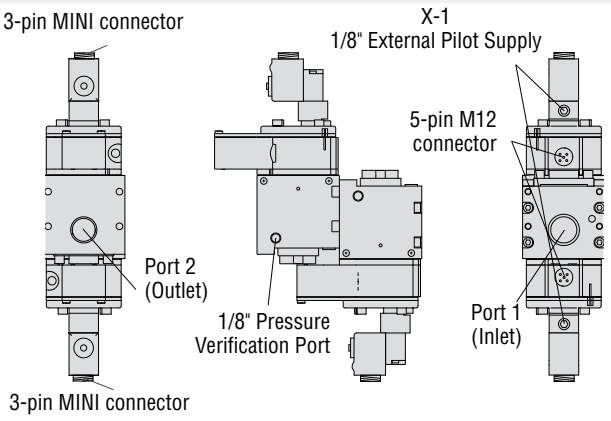
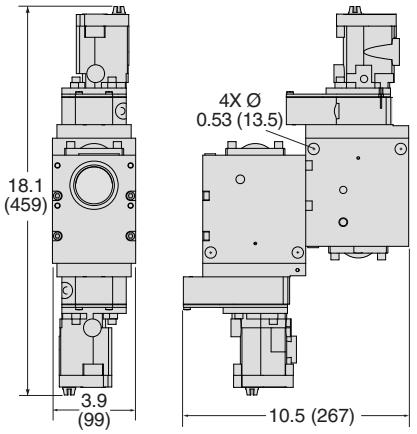
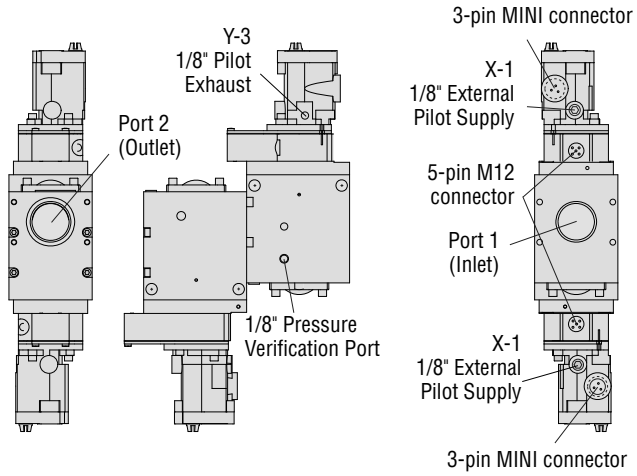
Single



Redundant

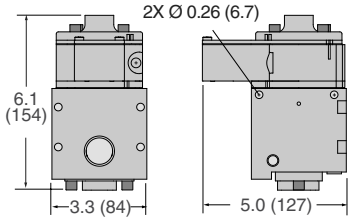
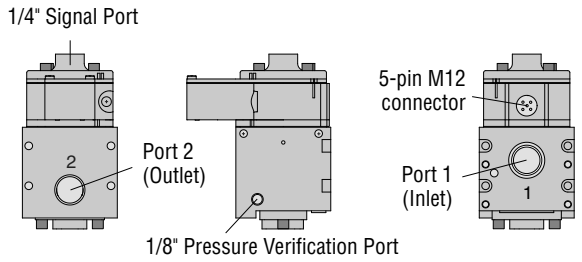
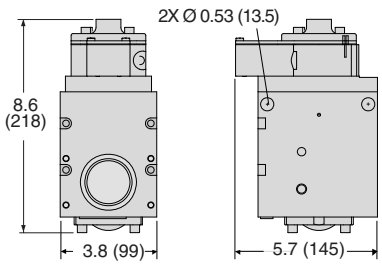
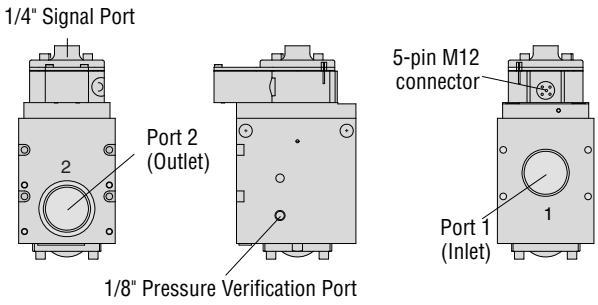
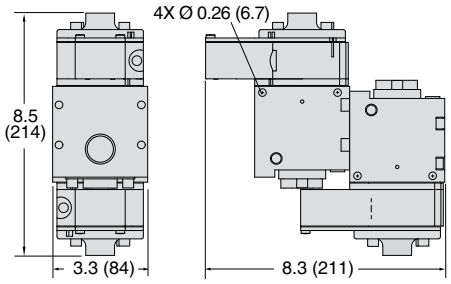
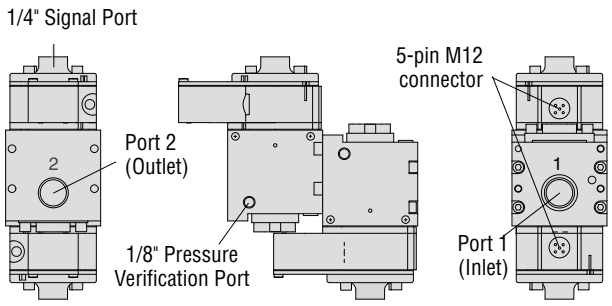
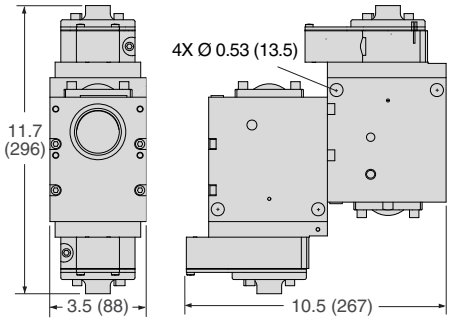
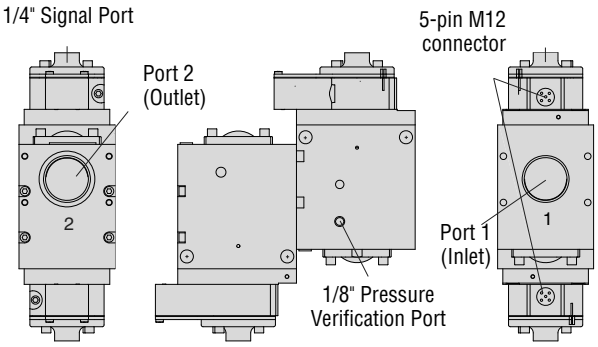


DIMENSIONS

Body Size	Single, Solenoid Pilot Controlled Valves	
3/4 (CNOMO Style Pilot)		
1-1/4 (Pacer Style Pilot)		
Redundant, Solenoid Pilot Controlled Valves		
3/4 (CNOMO Style Pilot)		
1-1/4 (Pacer Style Pilot)		

Downloadable CAD models available.

DIMENSIONS

Body Size	Single, Pressure Controlled Valves	
3/4 (CNOMO Style Pilot)		
1-1/4 (Pacer Style Pilot)		
	Redundant, Solenoid Pilot Controlled Valves	
3/4 (CNOMO Style Pilot)		
1-1/4 (Pacer Style Pilot)		

Downloadable CAD models available.

Accessories

ENERGY RELEASE VERIFICATION

Visual Pressure Indicator	Pressure Switch
	

Illustration examples.

Visual Pressure Indicator

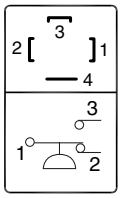
Verification Type	Installation Location	Indicator Type	Model Number	Port Thread
Pneumatic	Pressure Sensing Port	Visual Pop-up Pin	988A30	1/8 NPT

Pressure Switch

Verification Type	Installation Location	Connector Type	Model Number	Port Thread	Factory Preset psi (bar)
Electrical	Pressure Sensing Port or Downstream	DIN EN 175301-803 Form A	586A86	1/8 NPT	5 (0.3) falling

Pinout

DIN EN 175301-803 Form A



1 - Common
2 - Normally Closed
3 - Normally Open
4 - Ground (Not Used)

PREWIRED ELECTRICAL CONNECTORS

Illustration example.

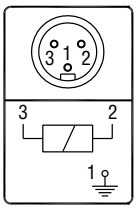
	Cable					Kit Number *
	End 1 Connector	End 2 Cord	Length meters (feet)	Connection	Quantity Included	Without Light
Prewired Connector Kits	MINI, 3-pin	Flying leads	4 (13.1)	Solenoid	1	2239H77
	M12, 5-pin			Sensing Switch	1	
	MINI, 3-pin	Flying leads	10 (32.8)	Solenoid	1	2240H77
	M12, 5-pin			Sensing Switch	1	

	Cable						Model Number *
	End 1 Connector	End 2 Cord	Connection	Length meters (feet)	Cord Diameter mm	Quantity Included	Without Light
Prewired Connectors for Pressure Controlled Valves	M12, 5-pin	Flying Leads	Sensing Switch	4 (13.1)	6	1	2241H77
				10 (32.8)	10	1	2242H77

**** Redundant valves require two Connector Kits or two Pre-wired Connectors.***

Solenoid Connector Pinout

MINI, 3-pin

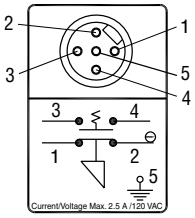


1 - Green/Yellow (Ground)
2 - Blue
3 - Brown

Sensing Switch Connector Pinout

M12, 5-pin

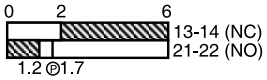
Valve Basic Size 3/4 & 1-1/4



1 - Brown
2 - White
3 - Blue
4 - Black
5 - Gray
Current/Voltage Max. 2.5 A / 120 V AC

Integrated Double-Pole Single-Throw Switch (DPST) Switch States
Contact conditions during switch travel (0 to 6 mm).

NC - Normally Closed
NO - Normally Open



The DPST switch is actuated whenever the valve is not in the normal home position.

SOLENOID PILOT INDICATOR LIGHT KITS

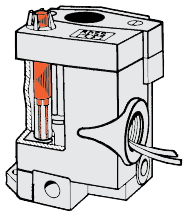


Illustration example.

	Kit Number		
	24 V DC	**110-120 V AC, 50-60 Hz**	**230 V AC, 50-60 Hz**
Indicator Light Kits	862K87-W	862K87-Z	862K87-Y
	To visually verify valve operation, indicator light kits are available for single solenoid models. Indicator lights are standard on double solenoid valves. The indicator light is illuminated when the solenoid is energized.		

SOLENOID PILOT MANUAL OVERRIDE KITS

Flush Button	**Extended Button**	**Extended Button with Palm**
		

Illustration examples.

	Manual Override Type	Kit Number	
		Locking Type	**Non-Locking Type**
Manual Override Kits	Flush Button	792K87	790K87
	Extended Button	–	791K87
	Extended Button with Palm	–	984H87
	Flush rubber button, non-locking manual override is standard on solenoid models. Each of the buttons in the override kits 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.		

CAUTIONS, WARNINGS And STANDARD WARRANTY

ROSS OPERATING VALVE, ROSS CONTROLS®, ROSS DECCO®, and AUTOMATIC VALVE INDUSTRIAL, collectively the "ROSS Group".

PRE-INSTALLATION or SERVICE

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

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

3. All applicable instructions should be read and complied with before using any fluid power system to prevent harm to persons or equipment. In addition, overhauled or serviced valves must be functionally tested prior to installation and use. If you have any questions, call your nearest ROSS Group location.

4. Each ROSS Group Product should be used within its specification limits. In addition, use only ROSS Group components to repair ROSS Group Products.

WARNINGS:
Failure to follow these instructions can result in personal injury and/or property damage.

FILTRATION and LUBRICATION

1. 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. The ROSS Group recommends a filter with a 5-micron rating for normal applications.

2. All standard ROSS Group filters and lubricators with polycarbonate plastic bowls are designed for compressed air applications only. 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 and hazardous leakage. Immediately replace crazed, cracked, or deteriorated bowls.

3. 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 which risks personal injury, and/or damage to property.

WARNINGS:
Failure to follow these instructions can result in personal injury and/or property damage.

AVOID INTAKE/EXHAUST RESTRICTION

1. Do not restrict air flow in the supply line. To do so could reduce the pressure of the supply air below minimum requirements for the valve and thereby causing erratic action.

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

WARNINGS: ***Failure to follow these instructions can result in personal injury and/or property damage.***

SAFETY APPLICATIONS

1. 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.

2. Safe Exhaust (dump) valves without a self-contained monitoring device should be used only in conjunction with a control system which assures monitoring of the valve. All Safe Exhaust valve installations should incorporate a monitoring system which inhibits further operation of the valve and machine in the event of a failure within the valve mechanism.

3. Per specifications and regulations, the ROSS L-O-X® and L-O-X® with EEZ-ON®, N06 and N16 Series operation products are defined as energy isolation devices, NOT AS EMERGENCY STOP DEVICES.

WARNINGS:
Failure to follow these instructions can result in personal injury and/or property damage.

STANDARD WARRANTY

All products sold by the ROSS Group are warranted for a one-year period [with the exception of Filters, Regulators and Lubricators ("FRLs") which are warranted for a period of seven (7) years] from the date of purchase. All products are, during their respective warranty periods, warranted to be free of defects in material and workmanship. The ROSS Group's obligation under this warranty is limited to repair, replacement or refund of the purchase price paid for products which the ROSS Group has determined, in its sole discretion, are defective. All warranties become void if a product has been subject to misuse, misapplication, improper maintenance, modification or tampering. Products for which warranty protection is sought must be returned to the ROSS Group freight prepaid.

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