



CLUTCH/BRAKE CONTROL

SERPAR[®] L-G MONITORED DOUBLE VALVES

PRODUCT CATALOG



SERPAR® Double Valves with L-G Monitor 35 Series

Product Overview



Clutch/Brake Control Function

The SERPAR® L-G double valve is designed to provide control of clutch/brake mechanisms on mechanical stamping presses as well as other safety applications, such as alternative lockout systems for energy isolation.

Valve Body Size	Solenoid Wiring	Simplified Schematic
4		
8, 12, 30		

The SERPAR® Series valves are internally monitored double valves with a built-in monitoring device that checks for the proper operation of each valve element. If the internal monitor detects a valve fault on a particular cycle, the double valve will fail to a safe condition (all downstream air is exhausted) and the monitor will lock-out to inhibit further operation of the device. Normal operation can only be resumed by a momentary reset signal to the valve.

VALVE FEATURES



Monitoring	Internal, Pneumatic (L-G) monitoring; requires no additional monitoring circuitry
Poppet Design	Dirt tolerant, wear compensating for quick response and high flow capacity
PTFE Backup Piston Rings	Enhances valve endurance enabling operation with or without in-line lubrication
Automatic Lock-out	Automatic lock-out/inhibit upon detection of a malfunction
Fault Detection	Default to de-energized position upon fault detection
Valve Reset	Pneumatic reset, with a momentary external pneumatic signal
Mounting	In-line, with piping flanges
Overrides	Basic Size 4 – Manual, flush button Basic Size 8, 12, 30 – Manual, rubber grommet
SISTEMA Library	Available for download at rosscontrols.com

STANDARD SPECIFICATIONS

GENERAL	Function		3/2 Valve		
	Construction Design		Dual Poppet		
	Actuation		Electrical – Solenoid Pilot Controlled		
	Mounting	Type	In-line		
		Orientation	Preferably vertically (with pilot solenoids on top)		
	Connection		Threaded; G, NPT		
	Monitoring		Internal; L-G monitor		
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		Valve Basic Size	4	30 to 100 psig (2.1 to 7 bar)
				8, 12, 30	30 to 125 psig (2.1 to 8.5 bar)
	Reset Pressure	Remote	Valve Basic Size	4	Require a pressure of minimum 30 psig (2 bar)
				8, 12, 30	Require a pressure of minimum 60 psig (4 bar)
Manual		Valve Basic Size 4 Only		Use internal valve pressure	
ELECTRICAL DATA	Solenoids		According to VDE 0580. Two solenoids, rated for continuous duty		
	Operating Voltage		24 volts DC; 110-120 volts AC, 50/60 Hz; 230 volts AC, 50/60 Hz		
	Power Consumption	Valve Basic Size	4	11 watts on DC; 30 VA inrush, 16 VA holding on 50 or 60 Hz	
			8, 12, 30	14 watts on DC; 87 VA inrush, 30 VA holding on 50 or 60 Hz	
	Enclosure Rating		IP65, IEC 60529		
Electrical Connection	Valve Basic Size	4	EN 175301-803 Form A, uses two cord-grip connectors at solenoids		
		8, 12, 30	Uses terminal strip connectors		
CONSTRUCTION MATERIAL	Valve Body		Cast Aluminum		
	Poppet		Acetal and Stainless Steel		
	Seals		Buna-N		

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

PRODUCT CREDENTIALS

Safety Category	CSA Certificate of Compliance	CE Conformity Declaration	EAC Conformity Declaration	ISO Standard
				ISO 13849-1:2015

Ordering Information

MODEL NUMBER CONFIGURATOR

3-Way 2-Position Valves

VALVE BASIC SIZE 4

Thread	Series	Revision Level	319	1	W
G D	35	73	D		
NPT Leave Blank					
	Type/Function				
	3/2-Way Solenoid				
	Port Size – Flanged Ports				
	Basic Size	Port Size			
	4	3/8	319		
		1/2	421		
		3/4	521		
	Inlet Orientation	Monitor Reset			
	Right	Manual	1		
		Remote	2		
	Left	Manual	5		
		Remote	6		
	Voltage*				
	24 volts DC		W		
	110-120 volts AC, 50/60 Hz		Z		
	230 volts AC, 50/60 Hz**		Y		

*For other voltages consult ROSS.
 **230 V AC not available in the U.S.
 (OSHA regulations limit press control voltage to no more than 120 volts AC).

Valve Basic Size	Inlet Port Size	Flow Cv		Avg. Response Constants			Weight lb (Kg)
				M	F		
		1-2	2-3		1-2	2-3	
4	3/8	3	6	15	0.70	0.40	8.4 (3.8)
	1/2	3	8	15	0.65	0.35	
	3/4	3	9	15	0.65	0.35	

Valve Response Time	<p>The constants above, designated M and F, can be used to determine the amount of time required to fill or exhaust a volume of any size using the formula on the right.</p> <p>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</p>
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RESET VALVES for L-G MONITOR	<p>On valve models with manual reset a button on the side of the monitor is pushed to perform the reset function.</p> <p>Valves with remote reset option require a small 3/2 reset valve and the installation of a 1/8 inch air line from the reset valve to the reset port of the double valve. ROSS offers 3/2 normally closed valves with either manual or electric control that are suitable for this purpose.</p>
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MODEL NUMBER CONFIGURATOR

3-Way 2-Position Valves

VALVE BASIC SIZE 8, 12, 30

Thread	Series	Revision Level	Voltage*	
G D	35	73	24 volts DC W	
NPT Leave Blank	Type/Function	A	110-120 volts AC, 50/60 Hz Z	
	3/2-Way Solenoid	5152	230 volts AC, 50/60 Hz** Y	
		W	<p>* For other voltages consult ROSS.</p> <p>** 230 V AC not available in the U.S. (OSHA regulations limit press control voltage to no more than 120 volts AC).</p>	

Port Size – Flanged Ports				Port Size – Flanged Ports			
Overrides	Basic Size	Port Size #		Overrides	Basic Size	Port Size #	
With Manual Overrides	8	1/2	4142	Without Overrides	8	1/2	4162
		3/4	5142			3/4	5162
	12	3/4	5152		12	3/4	5172
		8	1			6152	8
	12	1	6162		12	1	6182
		1-1/4	7162			1-1/4	7182
30	1-1/4	7152	30	1-1/4	7172		
	1-1/2	8162		1-1/2	8182		

2 inch Port Size available on Basic Size 30 valves. Order model number 1999H77 flange kit separately.

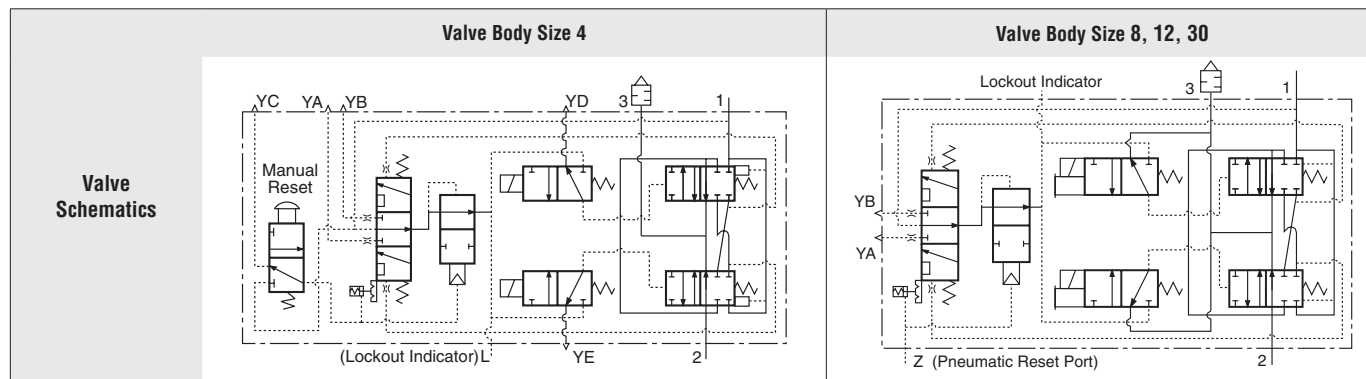
Valve Basic Size	Inlet Port Size	Flow Cv		Avg. Response Constants			Weight lb (Kg)
				M	F		
		1-2	2-3			1-2	
8	1/2	3.5	8.5	15	0.70	0.30	15.3 (6.9)
	3/4	4.0	12	15	0.65	0.23	
12	3/4	8.0	15	15	0.65	0.23	19.0 (8.6)
8	1	4.0	12	20	0.33	0.21	15.3 (6.9)
12	1	8.5	19	20	0.28	0.21	19.0 (8.6)
	1-1/4	9.0	21	20	0.28	0.21	
30	1-1/4	20	42	25	0.19	0.07	37.5 (16.9)
	1-1/2	21	43	25	0.18	0.07	

Valve Response Time

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

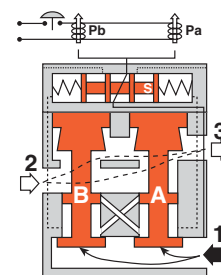
Vlv. Resp. Time (msec) = M + F * V
M = avg. time for parts movement
F = msec. per cubic inch of volume
V = volume in cubic inches

Valve Operation



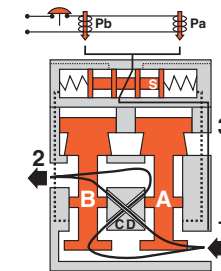
Conditions at Start

Inlet 1 is closed to outlet 2 by both valve elements A and B. Outlet 2 is open to exhaust 3. Pilot air is ported from inlet 1 and through the center section of spool S to the normally closed pilots Pa and Pb. Monitoring pressure signals at both ends of spool S are exhausted.



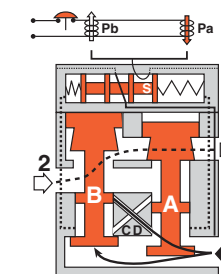
Normal Operation

Simultaneously energizing both solenoids actuates both pilots and causes valve elements A and B to shift. Inlet 1 is then connected to outlet 2 via crossflow passages C and D. Exhaust 3 is closed. Monitoring pressure signals go to each end of spool S and become equal to inlet pressure.



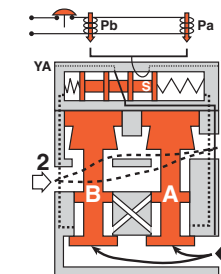
Detecting a Malfunction

A malfunction in the system or the valve itself could cause one valve element to be open and the other closed. Air then flows past the inlet poppet on valve element A, into crossflow passage D, but is substantially blocked by the spool portion of element B. The large size of the open exhaust passage past element B keeps the pressure at the outlet port below two percent of inlet pressure. Full monitoring air pressure from side A goes to the right end of spool S, and a reduced pressure goes to the left end. This pressure imbalance causes the spool to shift to the left. This shuts off and exhausts pilot air to both solenoid pilots, and allows valve element A to return to the closed position.



L-G Monitor Locked-out

When the L-G spool shifts it is held by a lockout pin (not shown). Pilot air is then exhausted to atmosphere via port YB, and pilot supply air is diverted to atmosphere via port YA. The lockout mechanism must be reset before the valve can return to normal operation. During and following reset, the pilot solenoids must be kept de-energized to prevent inadvertent and possibly dangerous cycling of the press. The reset function is either manual or remote-pneumatic depending on valve model.



Both solenoids must be energized simultaneously to shift the valve; maintained signal required to keep valve shifted.

WARNING: If monitor must be reset, electrical signals to both solenoids must be removed to prevent the machine controlled by the valve from immediately recycling and producing a potentially hazardous condition.

DIMENSIONS	Inches (mm)
Basic Size 4	<p>1/8 Remote pneumatic reset port or manual reset</p> <p>Inlet or outlet port</p> <p>8.00 (203)</p> <p>5.10 (129)</p> <p>2.50 (62)</p> <p>1.41 (36)</p> <p>2.80 (70)</p> <p>6.10 (155)</p> <p>0.31 (7.8) 2 places</p> <p>LEFT SIDE</p> <p>RIGHT SIDE</p> <p>2.05 (52)</p> <p>4.10 (104)</p> <p>6.70 (170)</p> <p>7.30 (183)</p> <p>3.08</p>
Basic Size 8	<p>Port 2 (outlet)</p> <p>12.30 (312)</p> <p>0.28 (7) (4 places)</p> <p>2.10 (53)</p> <p>3.68 (93)</p> <p>2.53 (64)</p> <p>5.06 (128)</p> <p>4.26 (106)</p> <p>2.47 (63)</p> <p>8.52 (216)</p> <p>1/8 Lockout indicator port</p> <p>1/8 Pneumatic reset port</p> <p>4.33 (110)</p> <p>1.25 (32)</p> <p>2.03 (52)</p> <p>1.69 (43)</p> <p>2.09 (53)</p> <p>2.60 (66)</p> <p>2.45 (62)</p> <p>7.20 (184)</p> <p>Port 1 (inlet)</p> <p>1/2 NPSC electrical opening</p>
Basic Size 12	<p>Port 2 (outlet)</p> <p>13.80 (351)</p> <p>0.34 (9) (4 places)</p> <p>3.00 (76)</p> <p>4.08 (104)</p> <p>2.75 (70)</p> <p>5.50 (140)</p> <p>4.48 (114)</p> <p>2.47 (63)</p> <p>8.96 (228)</p> <p>1/8 Lockout indicator port</p> <p>1/8 Pneumatic reset port</p> <p>5.22 (133)</p> <p>1.81 (46)</p> <p>2.40 (61)</p> <p>1.80 (46)</p> <p>2.09 (53)</p> <p>3.00 (76)</p> <p>2.45 (62)</p> <p>8.60 (216)</p> <p>Port 1 (inlet)</p> <p>1/2 NPSC electrical opening</p>
Basic Size 30	<p>Port 2 (outlet)</p> <p>17.80 (451)</p> <p>0.53 (13) (4 places)</p> <p>3.70 (93)</p> <p>4.10 (104)</p> <p>4.28 (109)</p> <p>8.56 (217)</p> <p>6.18 (157)</p> <p>2.47 (63)</p> <p>12.36 (314)</p> <p>1/8 Lockout indicator port</p> <p>1/8 Pneumatic reset port</p> <p>9.36 (238)</p> <p>4.52 (115)</p> <p>2.50 (64)</p> <p>2.27 (58)</p> <p>2.65 (67)</p> <p>5.90 (150)</p> <p>3.02 (77)</p> <p>11.10 (282)</p> <p>Port 1 (inlet)</p> <p>1/2 NPSC electrical opening</p>
<p>For additional information, and to assist you with piping and connectivity designs, our products are available in downloadable 2D and 3D CAD models in a wide range of formats at www.rosscontrols.com.</p>	

Accessories

ELECTRICAL STATUS INDICATION

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

ENERGY RELEASE VERIFICATION

Redundant Pressure Switch Assembly	Installation Location	Indicator Type	Connector Type	Model Number	Port Size	Factory Preset psi (bar)
	In-line Downstream	Mechanical Pressure Switch	EN 175301-803 Form A	RC026-13	3/8 NPT	5 (0.3) falling

Mechanical Pressure Switch Connectors Pinout

DIN EN 175301-803 Form A



- 1 - Common
- 2 - Normally Closed
- 3 - Normally Open
- G - Ground

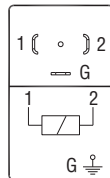
ELECTRICAL CONNECTORS

Pre-wired Connectors For Basic Size 4	Connection Type	Connector Type	End 1	End 2	Length meters (feet)	Cord Diameter	Kit Number				Quantity
							Without Light	Lighted Connector			
								24 V DC	120 V AC	230 V AC	
	Solenoid	EN 175301-803 Form A	Connector	Flying leads	2 (6.5)	6-mm	721K77	720K77-W	720K77-Z	720K77-Y	1
						10-mm	371K77	383K77-W	383K77-Z	383K77-Y	1

Connectors (no cable) For Basic Size 4	Connection Type	Connector Type	Fitting Connection	Kit Number				Quantity
				Without Light	Lighted Connector			
		24 V DC	120 V AC		230 V AC			
	Solenoid	EN 175301-803 Form A	Cable grip	937K87	936K87-W	936K87-Z	936K87-Y	1
			1/2" NPT conduit	723K77	724K77-W	724K77-Z	724K77-Y	1

Solenoid Connectors Pinout

DIN EN 175301-803 Form A



- 1 - Black
- 2 - Black
- G - Green/Yellow (Ground)

REPLACEMENT VALVES

Valve without Piping Flanges For Basic Size 4	Port Size	Valve Basic Size	Monitor Reset	Voltage	Valve Model Number*			
					Right Inlet		Left Inlet	
					G Thread	NPT Thread	G Thread	NPT Thread
	3/8, 1/2, 3/4	4	Manual	24 V DC	D3573D4241W	3573D4241W	D3573D4245W	3573D4245W
				120 V DC	D3573D4241Z	3573D4241Z	D3573D4245Z	3573D4245Z
				230 V DC	D3573D4241Y	3573D4241Y	D3573D4245Y	3573D4245Y
			Remote	24 V DC	D3573D4242W	3573D4242W	D3573D4246W	3573D4246W
				120 V DC	D3573D4242Z	3573D4242Z	D3573D4246Z	3573D4246Z
				230 V DC	D3573D4242Y	3573D4242Y	D3573D4246Y	3573D4246Y
	* For other voltages consult ROSS.							

Valve without Piping Flanges For Basic Size 8, 12, 30	Port Size	Valve Basic Size	Voltage	Valve Model Number*			
				Right Inlet		Left Inlet	
				G Thread	NPT Thread	G Thread	NPT Thread
	1/2, 3/4, 1	8	24 V DC	D3573A4202W	3573A4202W	D3573A4222W	3573A4222W
			120 V DC	D3573A4202Z	3573A4202Z	D3573A4222Z	3573A4222Z
			230 V DC	D3573A4202Y	3573A4202Y	D3573A4222Y	3573A4222Y
	3/4, 1, 1-1/4	12	24 V DC	D3573A4202W	3573A4202W	D3573A4222W	3573A4222W
			120 V DC	D3573A4202Z	3573A4202Z	D3573A4222Z	3573A4222Z
			230 V DC	D3573A4202Y	3573A4202Y	D3573A4222Y	3573A4222Y
	1-1/4, 1-1/2	30	24 V DC	D3573A4202W	3573A4202W	D3573A4222W	3573A4222W
120 V DC			D3573A4202Z	3573A4202Z	D3573A4222Z	3573A4222Z	
230 V DC			D3573A4202Y	3573A4202Y	D3573A4222Y	3573A4222Y	
* For other voltages consult ROSS.							


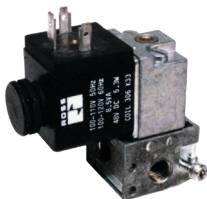


CONNECTION PIPING KITS

Valve Piping Flange Kits	Port Size	Valve Basic Size	Kit Number*		Flange Quantity
			G Thread	NPT	
	3/8	4	D658K77	658K77	2
	1/2	4	D659K77	659K77	2
		8	D661K77	661K77	2
	3/4	4	D660K77	660K77	2
		8	D662K77	662K77	2
		12	D664K77	664K77	2
	1	8	D663K77	663K77	2
		12	D665K77	665K77	2
1-1/4	12	D666K77	666K77	2	
	30	D667K77	667K77	2	
1-1/2	30	D668K77	668K77	2	
*Kits include all required seals and mounting bolts.					



RESET VALVES FOR DOUBLE VALVES WITH REMOTE RESET

Valves with the remote reset option require a small 3/2 reset valve and the installation of a 1/8 inch air line from the reset valve to the reset port of the double valve. ROSS offers 3/2 normally closed valves with either manual or electric control that are suitable for this purpose.

Compact Valves for Line Mounting	Miniature Valve for Base Mounting	Manual Palm Button Valves	Mushroom Valves
			

Direct Solenoid Pilot Control – Compact Valves for Line Mounting

Valve Type	Port Size	Valve Model Number*						Flow C _v	Average Response Constants**	
		BSPP (G) Thread			NPT Thread				M	F
	1, 2, 3	24 V DC	110-120 V AC 50/60 Hz	230 V AC 50/60 Hz	24 V DC	110-120 V AC 50/60 Hz	230 V AC 50/60 Hz			
Normally-Closed	1/8	D1613B1020W	D1613B1020Z	D1613B1020Y	1613B1020W	1613B1020Z	1613B1020Y	0.3	5	2.90

* For other voltages, consult ROSS.

**Valve Response Time	The constants above, designated M and F, can be used to determine the amount of time required to fill or exhaust a volume of any size using the formula on the right:	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
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Direct Solenoid Pilot Control – Miniature Valve for Base Mounting

Valve Type	Override Type	Valve Model Number*			Flow C _v
		24 V DC	110-120 V AC 50/60 Hz	230 V AC 50/60 Hz	
Normally-Closed	Non-Locking	W1413A1409W	W1413A1409Z	W1413A1409Y	0.1

* For other voltages, consult ROSS.

Sub-Base for Direct Solenoid Control Valves	Sub-Base Model Number	
	BSPP (G) Thread	NPT Thread
	D516B91	516B91

Manual Palm Button Valves

Valve Operator Type	Port Size	Button Color	Valve Model Number		Flow C _v
			BSPP (G) Thread	NPT Thread	
Heavy Duty Palm Button	1/4	Green	D1223B2001	1223B2001	0.8
		Red	D1223B2003	1223B2003	
Flush Pushbutton	1/4	Green	D1223B2FPG	1223B2FPG	0.9
		Red	D1223B2FPR	1223B2FPR	
Mushroom Button	1/4	Green	D1223B2MBG	1223B2MBG	
		Red	D1223B2MBR	1223B2MBR	

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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