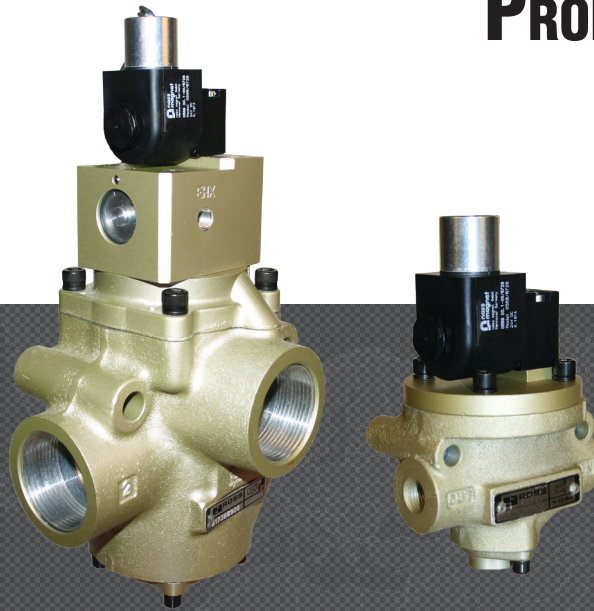




HAZARDOUS LOCATIONS DIRECTIONAL CONTROL VALVES 21 SERIES

PRODUCT CATALOG



Explosion-Proof Directional Control Valves 21 Series For Low Temperature Applications – Product Overview

Explosion-Proof Safety Function

Valves are equipped with explosion-proof coils for use in hazardous locations to prevent potentially explosive situations.

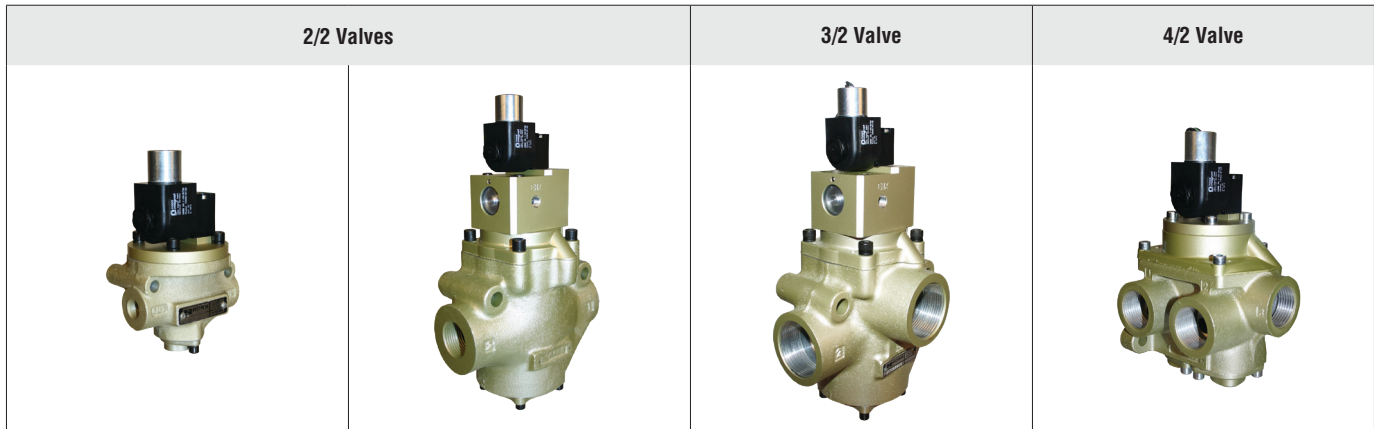


Illustration examples.

The 21 Series explosion-proof solenoid pilot controlled valves are ideal for low temperature applications in a wide range of industries and environments where safety from electrical ignition of flammable gases, vapors, flammable liquids, combustible dust, or easily ignitable fibers is a concern.

Applicable Requirements	C22.2 No. 0-10 - General Requirements - Canadian Electrical Code, Part II; CSA C22.2 No. 25-1966 - Enclosures for use in Class II Groups E, F and G Hazardous Locations; CSA C22.2 No. 142-M1987 - Process Control Equipment; C22.2 No. 213-M1987 - Nonincendive Electrical Equipment for Use in Class I, Division 2 Hazardous Locations; CAN/CSA E79-0-95 - Electrical apparatus for explosive atmospheres, Part 0: General requirements; CAN/CSA E79-18-95 - Electrical apparatus for explosive atmospheres, Part 18: Encapsulation "m".
APPROVED for use in the following Hazardous Locations	Ex m II T4 and Division 1 – Specifications in accordance to CSA certificate: Class I, Division 1, Groups A, B, C and D; Class II, Groups E, F and G; Class III; Class I, Division 2, Groups A, B, C, D
Specifications in accordance to FM certificate	Explosion-proof Class I, Division 1, Groups A, B, C, D, T4, Ta = 60 °C (encapsulation/explosion-proof Class I, Zone 1, AEx m II T4, Ta = 60 °C; dust-ignition-proof for Class II/III, Division 1, Groups E, F and G, T4, Ta = 60 °C); Nonincendive Class I, Division 2, Groups A, B, C, D, T4, Ta = 60 °C; Suitable for Class II, III, Division 2, Groups E, F, G, T4, Ta = 60 °C CSA CLASS 2258 02 – process control equipment – for hazardous locations FM CLASS 3600, 3611, 3615, 3810 – hazardous (classified) location electrical equipment

VALVE FEATURES

Poppet Design	Poppet construction for high dirt tolerance
High Velocity	Near zero leakage
Positive Sealing	No sliding action to prevent damage and wear
Explosion-proof Coils	Contain any spark originating from within the coil or housing preventing the ignition of any flammable material in the surrounding environment, resulting in a larger explosion
Flexible Pilot	Pilot can rotate, giving the ability to change orientation

STANDARD SPECIFICATIONS			
GENERAL	Function		2/2, 3/2, and 4/2 Valve
	Construction Design		Poppet
	Actuation		Electrical - Solenoid Pilot Controlled
	Mounting	Type	Inline
		Orientation	Vertically with pilot solenoids on top
	Connection		Threaded; G, NPT
Minimum Operation Frequency		Once per month, to ensure proper function	
OPERATING CONDITIONS	Temperature	Ambient	-4° to 140°F (-20° to 60°C)
		Media	-4° to 175°F (-20° to 80°C)
	Flow Media		Filtered air
	Operating Pressure		30 to 150 psig (2.1 to 10 bar)
External Pilot Supply		Must be equal to or greater than inlet pressure	
ELECTRICAL DATA	Solenoids	Operating Voltage	
		24 volts DC	
		120 volts AC, 60 Hz	
			Rated for continuous duty
	Enclosure Rating		IP65, IEC 60529
Electrical Connection		Three lead wires with 1/2" NPT conduit connection	
CONSTRUCTION MATERIAL	Valve Body		Cast Aluminum
	Poppet		Stainless Steel
	Seals		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.
IMPORTANT NOTE: Please read carefully and thoroughly all of the CAUTIONS, WARNINGS on the inside back cover.			

PRODUCT CREDENTIALS						
Safety Category	ATEX Certified	Factory Mutual Certification	Declaration of Conformity		CSA Certificate of Compliance	CRN Certification
Cat 1			CE	EAC		Available for appropriately tested valves

Ordering Information

MODEL NUMBER CONFIGURATOR

2-Way 2-Position Valves

21
71
B
401
5
W

Thread	
G	D
NPT	(Leave Blank)

Function	Default Position	
2/2	Normally Closed	71
	Normally Open	72

Current	Voltage*	
DC	24 V	W
AC	120 V, 60 Hz	Z

* For other voltages consult ROSS.

Solenoid Pilot Type	
Explosion-Proof	

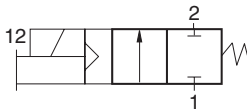
Body Size	Port Size		
	In-Out		
3/8	1/4		200
	3/8		300
	1/2		401
3/4	1/2		400
	3/4		500
	1		601
1-1/4	1		600
	1-1/4		700
	1-1/2		801

For ATEX certified valves order placement, consult ROSS.

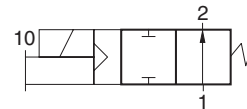
Body Size	Port Size	Flow C _v		Weight lb (kg)
		Normally Closed	Normally Open	
		1-2	1-2	
3/8	1/4	2.3	2.3	3.0 (1.4)
	3/8	3.8	3.3	
	1/2	4.0	3.5	
3/4	1/2	7.7	6.5	3.6 (1.6)
	3/4	9.0	7.3	
	1	9.0	7.9	
1-1/4	1	24	21	7.5 (3.4)
	1-1/4	29	20	
	1-1/2	29	21	

Valve Schematics

Normally Closed



Normally Open



MODEL NUMBER CONFIGURATOR 3-Way 2-Position Valves

Thread		Series	Revision Level			
G	D	21	B	200	5	W
NPT <i>(Leave Blank)</i>						

Function	Default Position	
3/2	Normally Closed	73
	Normally Open	74

Body Size	Port Size		
	In-Out	Exhaust	
3/8	1/4	1/2	200
	3/8	1/2	300
	1/2	1/2	401
3/4	1/2	1	400
	3/4	1	500
	1	1	601
1-1/4	1	1-1/2	600
	1-1/4	1-1/2	700
	1-1/2	1-1/2	801

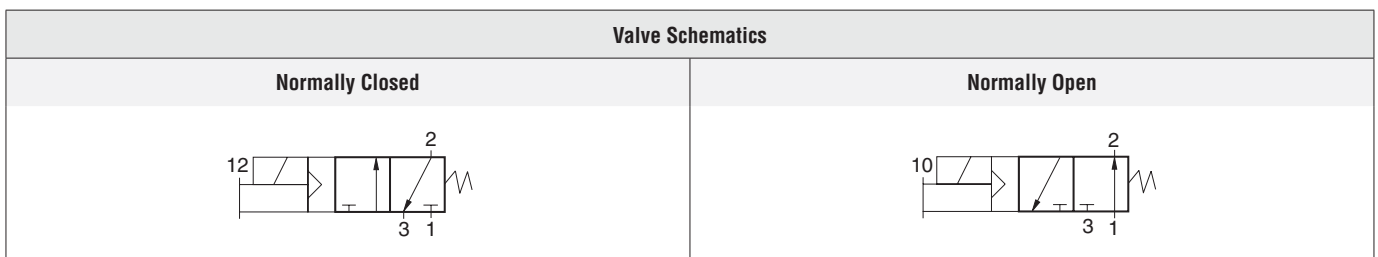
Current	Voltage*	
DC	24 V	W
AC	120 V, 60 Hz	Z

* For other voltages consult ROSS.

Solenoid Pilot Type
Explosion-Proof

For ATEX certified valves order placement, consult ROSS.

Body Size	Port Size		Flow C _v				Weight lb (kg)
			Normally Closed		Normally Open		
	1, 2	3	1-2	2-3	1-2	2-3	
3/8	1/4	1/2	2.5	3.1	2.3	2.7	2.5 (1.2)
	3/8	1/2	3.6	5.3	2.8	3.2	
	1/2	1/2	3.3	5.3	2.8	3.2	
3/4	1/2	1	6.3	9.2	6.3	8.0	3.3 (1.5)
	3/4	1	7.7	11	6.9	7.4	
	1	1	8.0	12	6.8	7.5	
1-1/4	1	1-1/2	23	34	17	24	7.0 (3.2)
	1-1/4	1-1/2	30	32	19	24	
	1-1/2	1-1/2	30	31	19	23	



Ordering Information

MODEL NUMBER CONFIGURATOR

4-Way 2-Position Valves

Thread		Series	Revision Level			
G	D	21	B	200	5	W
NPT (Leave Blank)						

Function	Default Position
4/2	Normally Closed

Body Size	Port Size		
	In-Out	Exhaust	
3/8	1/4	1/2	200
	3/8	1/2	300
	1/2	1/2	401
3/4	1/2	1	400
	3/4	1	500
	1	1	601
1-1/4	1	1-1/2	600
	1-1/4	1-1/2	700
	1-1/2	1-1/2	801

Current	Voltage*	
DC	24 V	W
AC	120 V, 60 Hz	Z

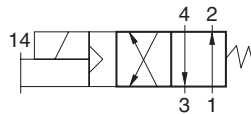
* For other voltages consult ROSS.

Solenoid Pilot Type
Explosion-Proof

For ATEX certified valves order placement, consult ROSS.

Body Size	Port Size		Flow C _v		Weight lb (kg)
	1, 2, 4	3	1-2, 1-4	4-3, 2-3	
3/8	1/4	1/2	2.1	2.2	3.0 (1.4)
	3/8	1/2	2.5	3.1	
	1/2	1/2	2.9	3.8	
3/4	1/2	1	5.7	6.5	5.8 (2.6)
	3/4	1	7.1	8.7	
	1	1	7.7	10	
1-1/4	1	1-1/2	18	23	12.0 (5.4)
	1-1/4	1-1/2	20	28	
	1-1/2	1-1/2	21	29	

Valve Schematic

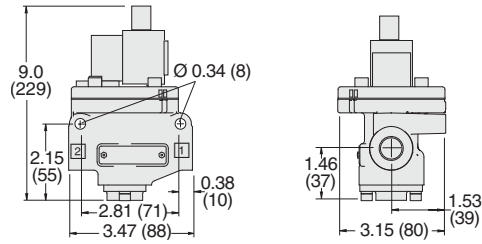


2/2 Valves

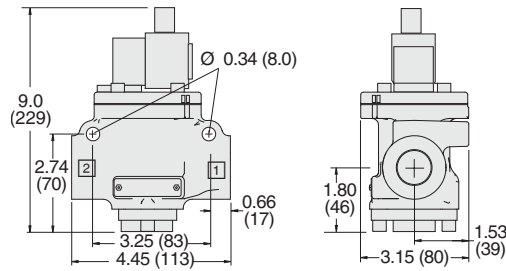
DIMENSIONS

Inches (mm)

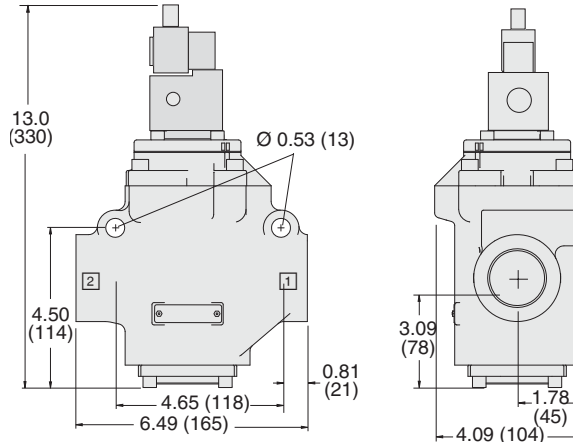
Body Size 3/8



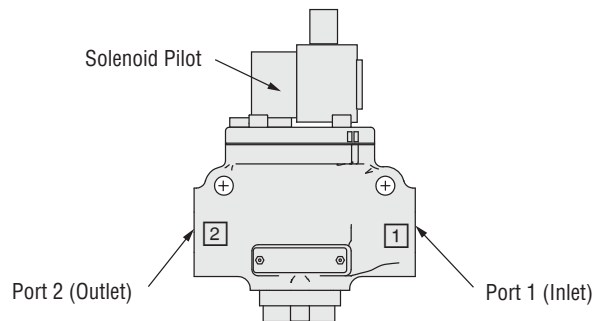
Body Size 3/4



Body Size 1-1/4



For additional information, and to assist you with piping and connectivity designs, our products are available in downloadable 2D drawings and 3D CAD models in a wide range of options including native formats, visit www.rosscontrols.com.



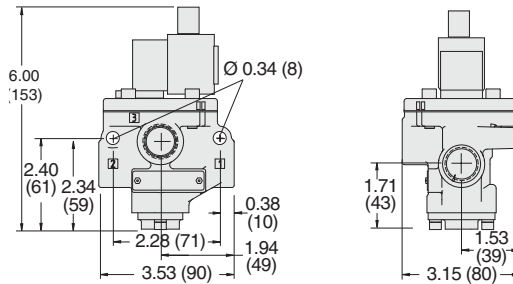
Valve Technical Data

3/2 Valves

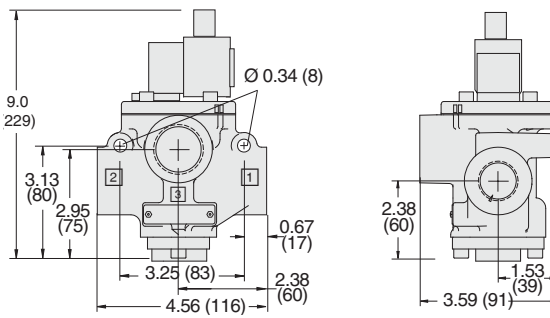
DIMENSIONS

Inches (mm)

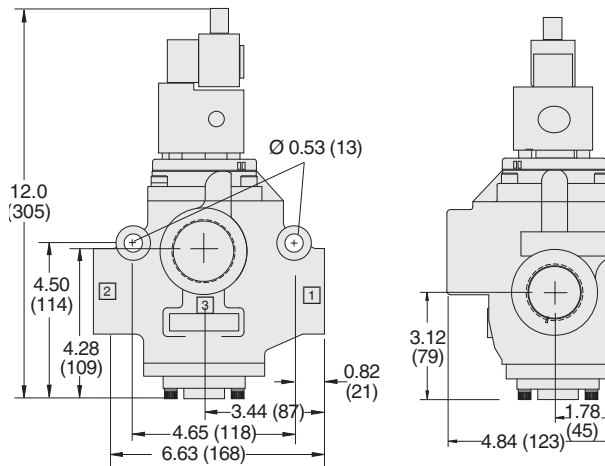
Body Size 3/8



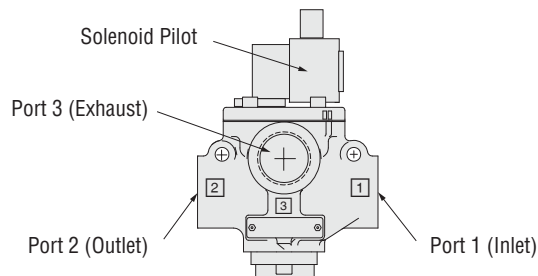
Body Size 3/4



Body Size 1-1/4



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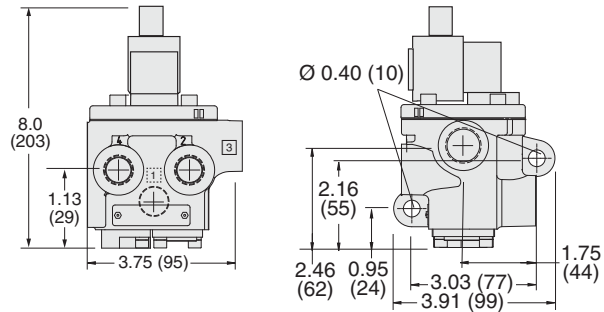


4/2 Valves

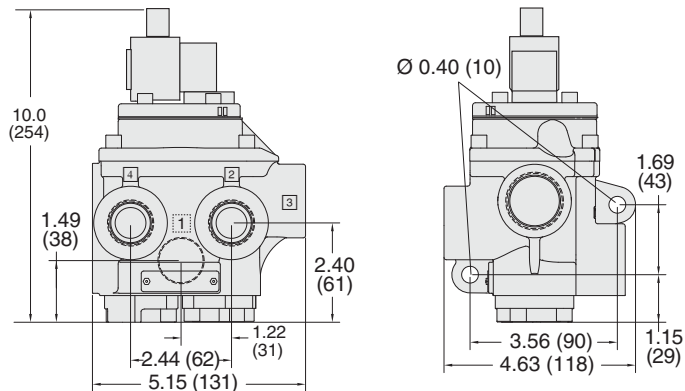
DIMENSIONS

Inches (mm)

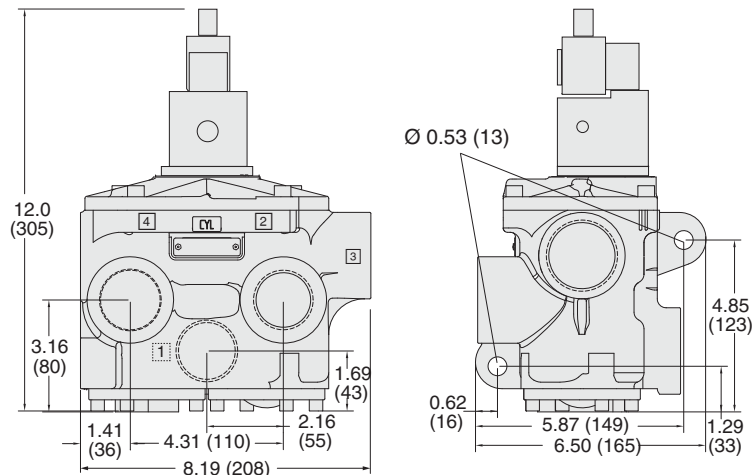
Body Size 3/8



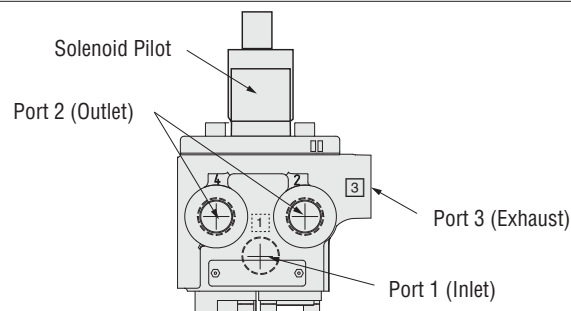
Body Size 3/4



Body Size 1-1/4



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Accessories

EXHAUST SILENCERS

Silencers	Port Size	Thread Type	Model Number		Flow Avg. C _v	Pressure Range psig (bar)
			R/Rp Thread	NPT Thread		
	1/2	Male	D5500A4003	5500A4003	4.7	
1	Male	D5500A6003	5500A6003	15	0-290 (0-20) maximum	
1-1/2	Female	D5500A8001	5500A8001	30		

FEMALE SILENCER CONNECTORS

Hex Nipples	Material	Fitting Pipe Size	Thread Type	Model Number	
				BSPT Thread	NPT Thread
	Steel	1-1/2	Male - Male	122J39	488J27

SOLENOID PILOT CONVERSION KITS

Conversion Kits	Description	Valve Body Size	Kit Number
	ROSS Controls standard poppet solenoid pilot controlled valves for line mounting can be easily field-converted into an explosion-proof solenoid pilot poppet valve. Listed on the right are the conversion kit numbers to replace the obsolete ROSS explosion proof pilot, or to convert a standard inline valve to an explosion-proof valve.	1/4" - 1" (C _v up to 10)	2370K77W
		1" (C _v up to 29) - 2-1/2"	2371K77W

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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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 fluid power components for the first time and those designing complex systems.

Other literature is available for engineering, maintenance, and service requirements.

If you need products or specifications not shown in this catalog, please visit ROSS' website, contact ROSS or your ROSS distributor. The ROSS Support Team will be happy to assist you in selecting the best product for your application.

For a current list of countries and local distributors, visit ROSS' at www.rosscontrols.com.