



CLUTCH/BRAKE CONTROL DOUBLE VALVES D-S MONITORED 35 SERIES

PRODUCT CATALOG



SERPAR® Double Valves with D-S Monitor 35 Series

Product Overview

Clutch/Brake Control Function

The SERPAR® double valve is designed to provide control of clutch/brake mechanisms on stamping presses, and many other critical applications such as alternative lockout systems for energy isolation, as well as other Category -3 and -4 safety circuits.








Illustration example.

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 properly resetting the monitor.

VALVE FEATURES

Monitoring	Electronic, uses electronic circuit and proximity switches with a comparator
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	Disables electrical circuit upon fault detection
Valve Reset	Dry contact; must be reset by a non-powered contact closure between terminals G and H
Mounting	In-line, with piping flanges
Overrides	Manual, rubber grommet
SISTEMA Library	Available for download

PRODUCT CREDENTIALS

Performance Level Per ISO 13849-1:2015	Safety Integrity Level Per IEC 2061:2001	Declaration of Conformity		Certificate of Compliance
				

STANDARD SPECIFICATIONS					
GENERAL	Function		3/2 Normally-Closed Valve		
	Construction Design		Dual Poppet		
	Actuation		Electrical	Solenoid Pilot Controlled	
	Mounting	Type	In-line		
		Orientation	Preferably vertically (with pilot solenoids on top)		
	Connection		Threaded	NPT, G	
	Monitoring		Internal dinamic	D-S 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		30 to 125 psig (2.1 to 8.5 bar)		
	D-S Monitor Reset		Non-powered contact closure		
ELECTRICAL DATA	Solenoids		Current Flow	Operating Voltage	Power Consumption (each solenoid)
			DC	24 volts	14 watts
			AC	110-120 volts AC, 50/60 Hz	87 VA inrush, 30 VA holding on 50 or 60 Hz
			Rated for continuous duty		
			Design according to VDE 0580		
	Power Consumption D-S Monitor		Rated for same voltage as pilot solenoids Power supply to monitor must be independent and continuous		
	Enclosure Rating		IP65, IEC 60529		
	Electrical Connection		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.					

Ordering Information

MODEL NUMBER CONFIGURATOR

3-Way 2-Position Valves

VALVE BASIC SIZE 8, 12, 30

Port Thread		35	7	3	B	5143	W
NPT							
Leave Blank							
G	D						
Series							
Actuation							
Solenoid Controlled							
Valve Function							
3/2							
Revision Level							

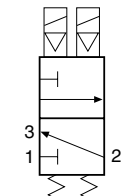
Current	Voltage *	
DC	24 V	W
AC	110-120 V, 50/60 Hz	Z

* For other voltages consult ROSS.

Port Size – Flanged Ports			
Overrides	Basic Size	Port Size #	
		In-Out	
With Manual Overrides	8	1/2	4143
		3/4	5143
	12	3/4	5153
	8	1	6153
		1	6163
	12	1-1/4	7163
	30	1-1/4	7153
		1-1/2	8163

Port Size – Flanged Ports			
Overrides	Basic Size	Port Size #	
		In-Out	
Without Overrides	8	1/2	4163
		3/4	5163
	12	3/4	5173
	8	1	6173
		1	6183
	12	1-1/4	7183
	30	1-1/4	7173
		1-1/2	8183

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

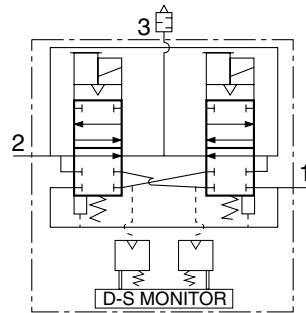
Size		Flow C _v (NI/min)		Avg. Response Constants			Weight lb (Kg)	Simplified Schematic
				M	F			
Basic	Port 1, 2	1-2	2-3			1-2	2-3	
8	1/2	3.5 (3400)	8.5 (8400)	15	0.70	0.30	16.8 (7.6)	
	3/4	4.0 (3900)	12 (12000)	15	0.65	0.23		
12	3/4	8.0 (7900)	15 (15000)	15	0.65	0.23	20.5 (9.2)	
8	1	4.0 (3900)	12 (12000)	20	0.33	0.21	16.8 (7.6)	
12	1	8.5 (8400)	19 (19000)	20	0.28	0.21	20.5 (9.2)	
	1-1/4	9.0 (8900)	21 (21000)	20	0.28	0.21		
30	1-1/4	20 (20000)	42 (41000)	25	0.19	0.07	39.3 (17.7)	
	1-1/2	21 (21000)	43 (42000)	25	0.18	0.07		

Valve Response Time

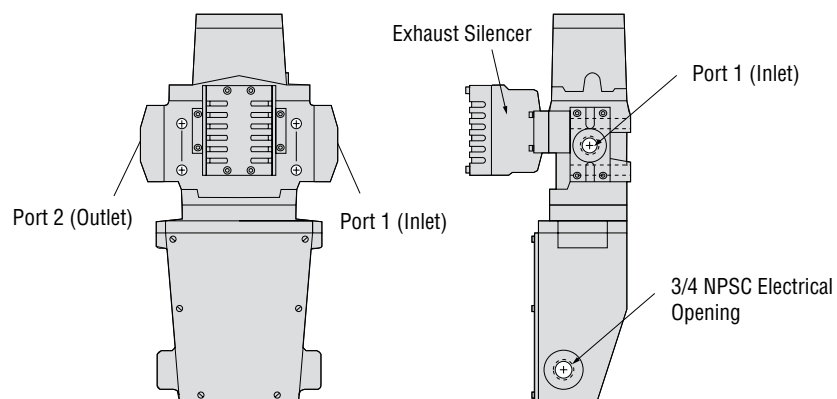
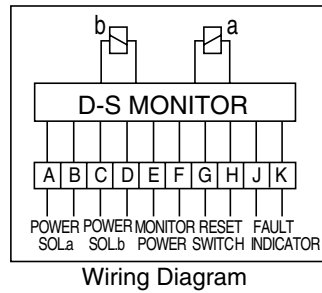
The constants above, designated M and F, can be used to determine the amount of time required to fill or exhaust a volume of any size using the formula on the right:

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 Schematic



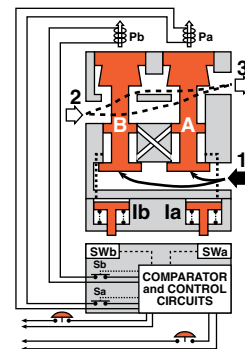
Monitor Wiring



Valve Operation

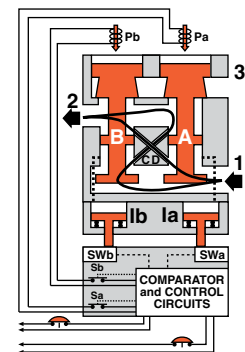
Conditions at Start

Inlet 1 is closed to outlet 2 by both valve elements A and B. Outlet 2 is open to exhaust 3. Contacts of switch SW are closed. 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 pressure indicators la and lb, causing the indicator pins to be extended and to actuate proximity switches SWa and SWb. In normal operation, each pair - solenoids, valve elements, indicators, and proximity switches - responds in unison so that the comparator circuits "read" the operation as normal.

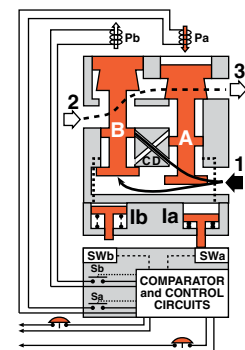


Completion of Normal Cycle

Simultaneously de-energizing both solenoids returns the valve to the "Conditions at Start" described above.

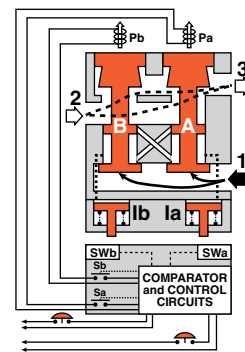
Detecting a Malfunction

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 pressure indicator la so that its pin is extended and actuates proximity switch SWa. When the time interval between the signal to a solenoid and the signal from its corresponding proximity switch exceeds approximately 175 milliseconds, the D-S monitor breaks contacts Sa and Sb as soon as solenoid power is removed. This allows valve element A to return to the closed position.



D-S Monitor Locked-out

With the valve locked out by contacts Sa and Sb, solenoids Pa and Pb cannot be energized. The monitor must be reset before another valve cycle can begin. Reset can be achieved by a separately connected ancillary switch, but not if the pilot solenoids are energized. The monitor can be reset by removing and reapplying power to the monitor even when the pilot solenoids are energized. For this reason it is necessary to have the pilot solenoids de-energized during and following reset to prevent inadvertent and possibly dangerous cycling of the press.



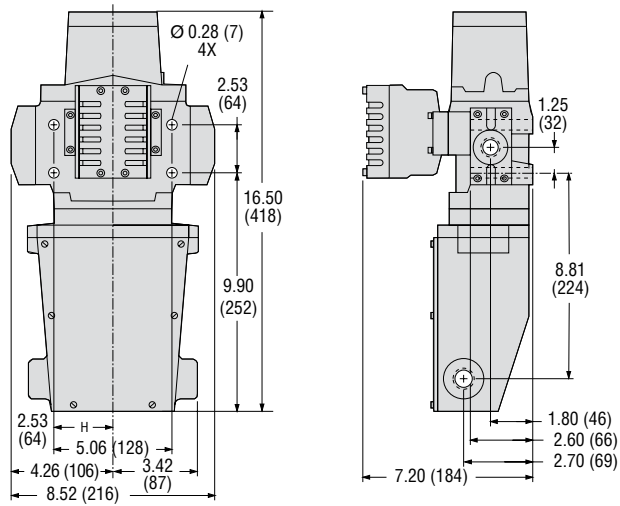
Both solenoids must be energized simultaneously to shift the valve; maintained signal required to keep valve shifted.

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.

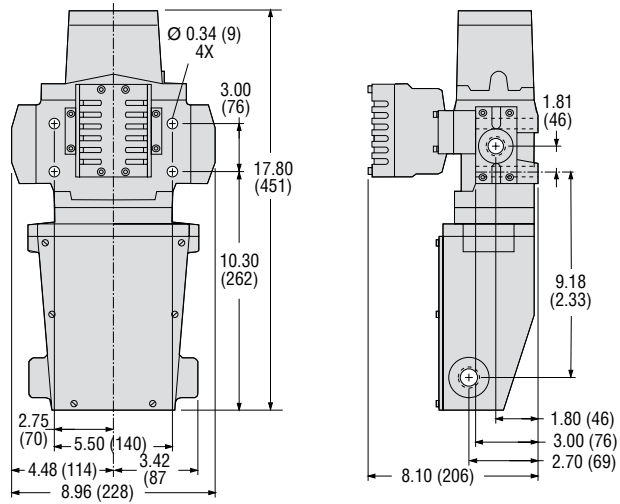
DIMENSIONS

Inches (mm)

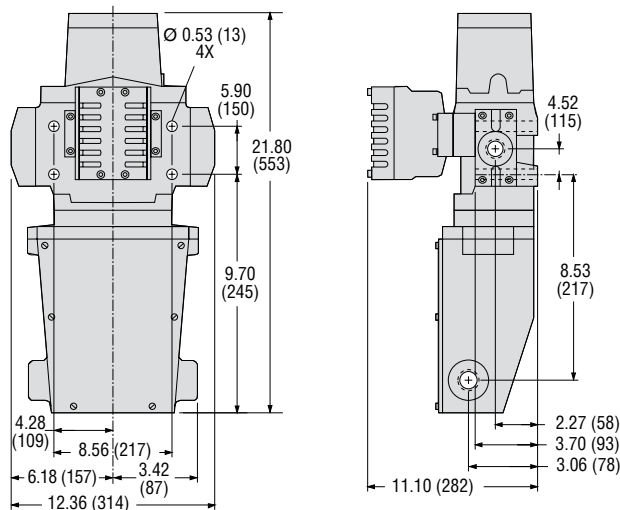
Basic Size 8



Basic Size 12



Basic Size 30



Downloadable CAD models available.

ENERGY RELEASE VERIFICATION



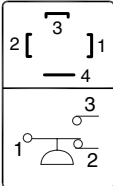
Pressure Switch	Redundant Pressure Switch Assembly
	

Illustration examples.

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
Redundant Pressure Switch Assembly	Verification Type	Installation Location	Connector Type	Model Number	Port Thread	Factory Preset psi (bar)
	Electrical (Dual)	Downstream	DIN EN 175301-803 Form A	RC026-13	3/8 NPT	5 (0.3) falling

Pinout	
DIN EN 175301-803 Form A	
	1 - Common 2 - Normally Closed 3 - Normally Open 4 - Ground (Not Used)

REPLACEMENT VALVES

Valve without Piping Flanges	Port Size	Valve Basic Size	Voltage	Valve Model Number*			
				With Manual Overrides		Without Overrides	
	In-Out			NPT Thread	G Thread	NPT Thread	G Thread
	1/2, 3/4, 1	8	24 V DC	3573A4203W	D3573A4203W	3573A4223W	D3573A4223W
			120 V DC	3573A4203Z	D3573A4203Z	3573A4223Z	D3573A4223Z
	3/4, 1, 1-1/4	12	24 V DC	3573A5203W	D3573A5203W	3573A5223W	D3573A5223W
			120 V DC	3573A5203Z	D3573A5203Z	3573A5223Z	D3573A5223Z
	1-1/4, 1-1/2	30	24 V DC	3573A7203W	D3573A7203W	3573A7223W	D3573A7223W
			120 V DC	3573A7203Z	D3573A7203Z	3573A7223Z	D3573A7223Z
	* For other voltages, consult ROSS.						

CONNECTION PIPING KITS

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

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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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.