Clutch/Brake Control
Serpar® L-G Monitored Double Valves

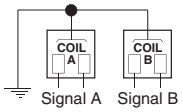
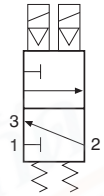
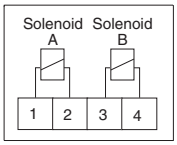
Product Catalog

ROSS™
a global family

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

Specifications

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**
SIL 3 Functional Safety		CE	EAC	ISO 13849-1:2015

Ordering Information

MODEL NUMBER CONFIGURATOR — 3-Way 2-Position Valves

Valve Basic Size 4

[ ]	35	73	D	319	1	W
Thread	Series	Type/Function	Revision Level	Port Size – Flanged Ports	Inlet Orientation / Monitor Reset	Voltage*

Thread

G	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

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	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

RESET VALVES for L-G MONITOR	On valve models with manual reset a button on the side of the monitor is pushed to perform the reset function. 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.

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Ordering Information

MODEL NUMBER CONFIGURATOR — 3-Way 2-Position Valves

Valve Basic Size 8, 12, 30

	35	73	A	5152	W
	Series	Type/Function	Revision Level		

Thread	
G	D
NPT	Leave Blank

Type/Function
3/2-Way Solenoid

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).

Port Size – Flanged Ports			
Overrides	Basic Size	Port Size #	
With Manual Overrides	8	1/2	4142
		3/4	5142
	12	3/4	5152
	8	1	6152
	12	1	6162
		1-1/4	7162
	30	1-1/4	7152
		1-1/2	8162

Port Size – Flanged Ports			
Overrides	Basic Size	Port Size #	
Without Overrides	8	1/2	4162
		3/4	5162
	12	3/4	5172
	8	1	6172
	12	1	6182
		1-1/4	7182
	30	1-1/4	7172
		1-1/2	8182

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

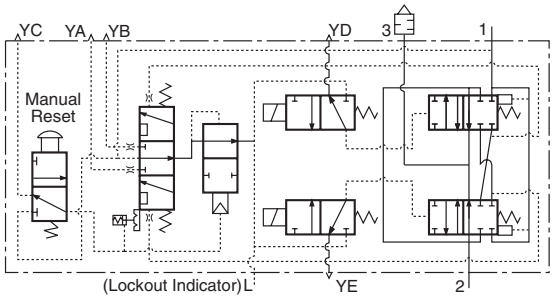
Valve Basic Size	Inlet Port Size	Flow Cv		Avg. Response Constants			Weight lb (Kg)
				M	F		
		1-2	2-3		1-2	2-3	
8	1/2	3.5	8.5	15	0.70	0.30	15.3 (6.9)
	3/4	4.0	12	15	0.65	0.23	
12	3/4	8.0	15	15	0.65	0.23	19.0 (8.6)
8	1	4.0	12	20	0.33	0.21	15.3 (6.9)
12	1	8.5	19	20	0.28	0.21	19.0 (8.6)
	1-1/4	9.0	21	20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

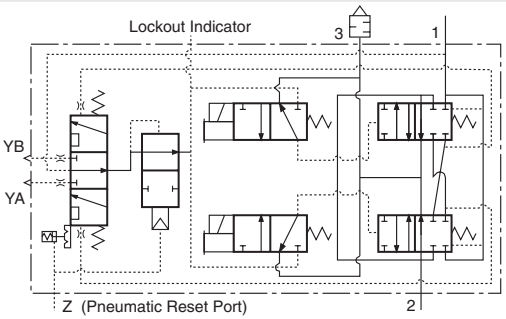
Valve Operation

Valve Schematics

Valve Body Size 4

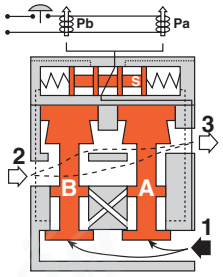


Valve Body Size 8, 12, 30



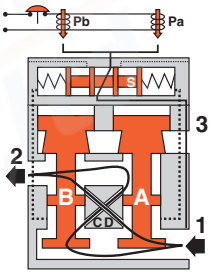
Conditions at Start

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.



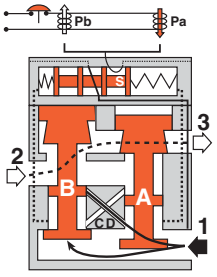
Normal Operation

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.



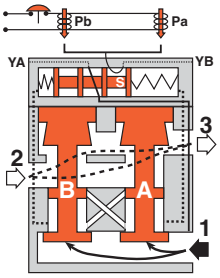
Detecting a Malfunction

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.

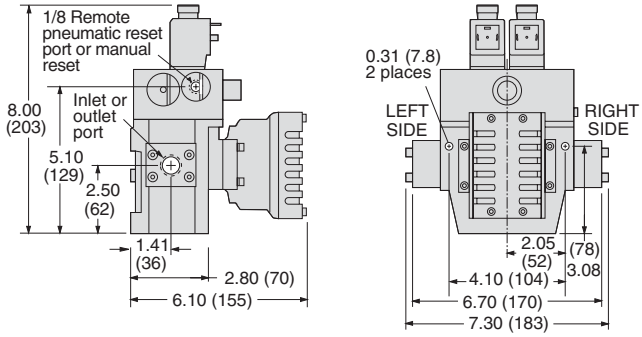


Both solenoids must be energized simultaneously to shift the valve; maintained signal required to keep valve shifted.

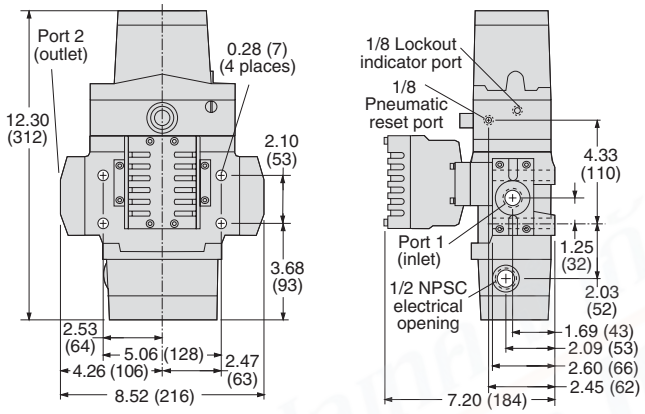
WARNING: *If monitor must be reset, electrical signals to both solenoids must be removed to prevent the machine controlled by the valve from immediately recycling and producing a potentially hazardous condition.*

DIMENSIONS — Inches (mm)

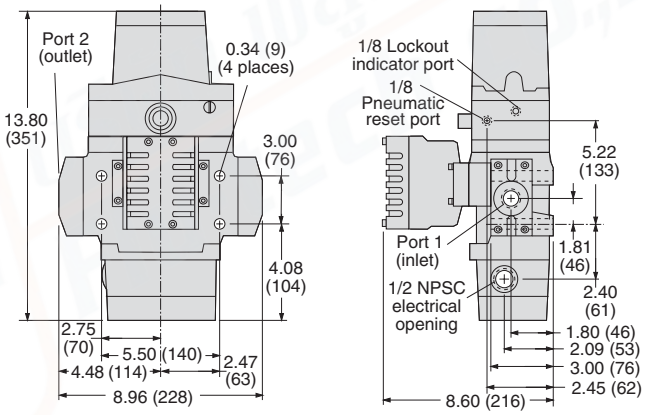
Basic Size 4



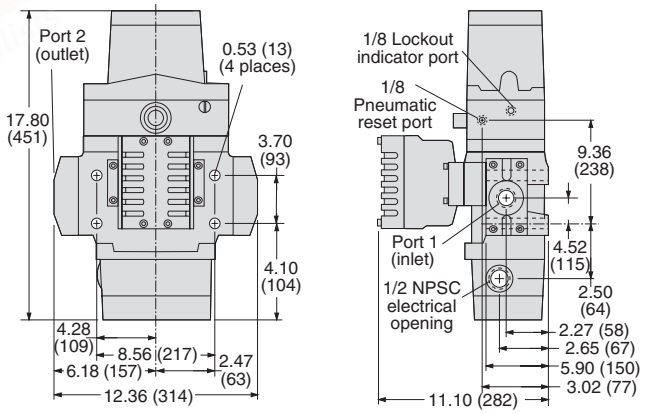
Basic Size 8



Basic Size 12



Basic Size 30



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.

Accessories

ELECTRICAL STATUS INDICATION

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

ENERGY RELEASE VERIFICATION

	Installation Location	Indicator Type	Connector Type	Model Number	Port Size	Factory Preset psi (bar)
Redundant Pressure Switch Assembly	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

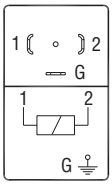
ELECTRICAL CONNECTORS

	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	
Pre-wired Connectors **For Basic Size 4**	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

	Connection Type	Connector Type	Fitting Connection	Kit Number				Quantity
				Without Light	Lighted Connector			
					24 V DC	120 V AC	230 V AC	
Connectors (no cable) **For Basic Size 4**	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)

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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.

Options

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					
	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		M	F
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

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	