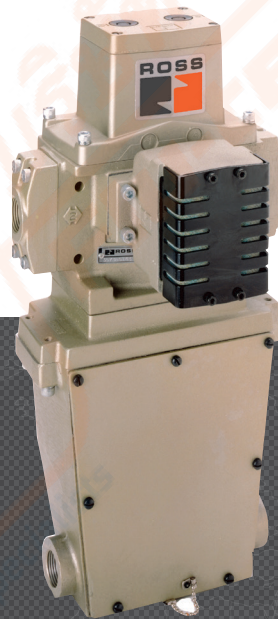




บริษัท ฟลูเทค จำกัด  
**Flu-tech co.,ltd**  
Authorized Distributor

# CLUTCH/BRAKE CONTROL SERPAR<sup>®</sup> D-S MONITORED DOUBLE VALVES

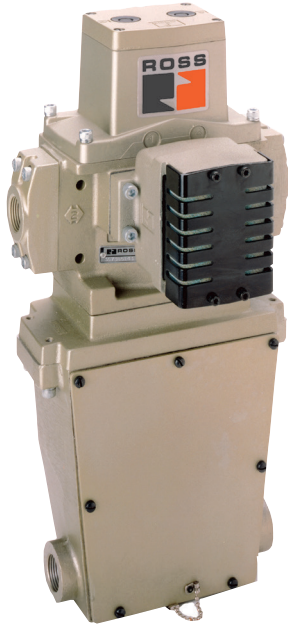


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FLU - TECH CO., TD

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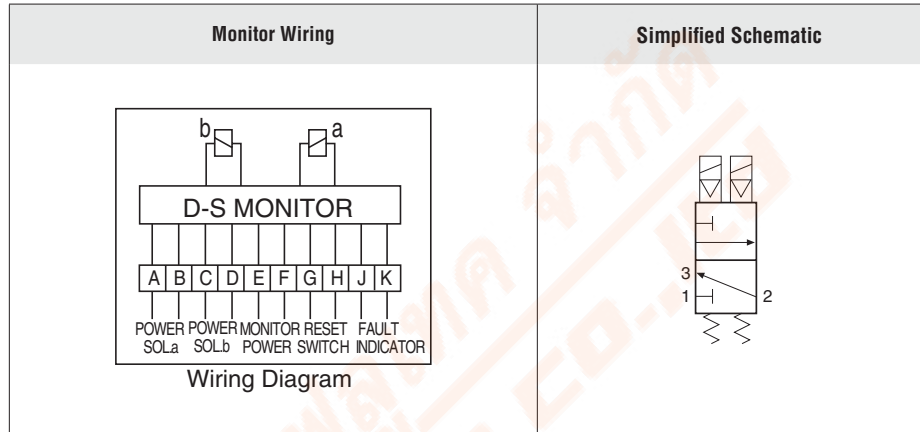
# SERPAR® Double Valves with D-S Monitor 35 Series

## 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.



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

<b>Monitoring</b>	Electronic, uses electronic circuit and proximity switches with a comparator
<b>Poppet Design</b>	Dirt tolerant, wear compensating for quick response and high flow capacity
<b>PTFE Backup Piston Rings</b>	Enhances valve endurance enabling operation with or without in-line lubrication
<b>Automatic Lock-out</b>	Automatic lock-out/inhibit upon detection of a malfunction
<b>Fault Detection</b>	Disables electrical circuit upon fault detection
<b>Valve Reset</b>	Dry contact; must be reset by a non-powered contact closure between terminals G and H
<b>Mounting</b>	In-line, with piping flanges
<b>Overrides</b>	Manual, rubber grommet
<b>SISTEMA Library</b>	Available for download at <a href="http://rosscontrols.com">rosscontrols.com</a>

## STANDARD SPECIFICATIONS

<b>GENERAL</b>	Function		Clutch/Brake Control	
	Construction Design		3/2 Normally-Closed valve, Dual Poppet	
	Actuation		Solenoid Pilot Controlled	
	Mounting	Type	In-line	
		Orientation	Preferably vertically (with pilot solenoids on top)	
	Connection		Threaded; BSPP (G), NPT	
	Monitoring		Internal dynamic; D-S monitor	
Minimum Operation Frequency		Once per month, to ensure proper function		
<b>OPERATING CONDITIONS</b>	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		
<b>ELECTRICAL DATA</b>	Solenoids		According to VDE 0580. Two solenoids, rated for continuous duty	
	Operating Voltage		24 volts DC; 110-120 volts AC, 50/60 Hz	
	Power Consumption	14 watts on DC, 87 VA inrush, 30 VA holding on 50 or 60 Hz		
		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		
<b>CONSTRUCTION MATERIAL</b>	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

<b>Safety Category</b>  	<b>CE Conformity Declaration</b>  	<b>EAC Conformity Declaration</b>  	<b>ISO Standard</b>  ISO 13849-1:2015	<b>CSA Certificate of Compliance</b>  
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# Ordering Information

## MODEL NUMBER CONFIGURATOR

## 3-Way 2-Position Valves

### VALVE BASIC SIZE 8, 12, 30

<b>Thread</b>	<b>Series</b>	<b>Revision Level</b>	<b>Voltage*</b>
BSPP (G) <b>D</b>	<b>35</b>	<b>73</b>	<b>24 volts DC</b> <b>W</b>
NPT <b>Leave Blank</b>	<b>Type/Function</b>	<b>B</b>	110-120 volts AC, 50/60 Hz <b>Z</b>
	<b>3/2-Way Solenoid</b>	<b>5143</b>	<i>*For other voltages consult ROSS.</i>
		<b>W</b>	

Port Size – Flanged Ports				Port Size – Flanged Ports			
Overrides	Basic Size	Port Size #		Overrides	Basic Size	Port Size #	
With Manual Overrides	8	1/2	4143	Without Overrides	8	1/2	4163
		3/4	5143			3/4	5163
	12	3/4	5153		12	3/4	5173
	8	1	6153		8	1	6173
		12	1			6183	12
	30	1-1/4	7163		30	1-1/4	7183
1-1/4		7153	1-1/4	7173			
		1-1/2	8163			1-1/2	8183

# 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	16.8 (7.6)
	3/4	4.0	12	15	0.65	0.23	
12	3/4	8.0	15	15	0.65	0.23	20.5 (9.2)
8	1	4.0	12	20	0.33	0.21	16.8 (7.6)
	12	1	8.5	19	0.28	0.21	
12	1-1/4	9.0	21	20	0.28	0.21	20.5 (9.2)
	30	1-1/4	20	42	0.19	0.07	
30	1-1/2	21	43	25	0.18	0.07	39.3 (17.7)

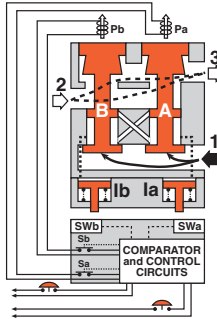
#### Valve Response Time

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:

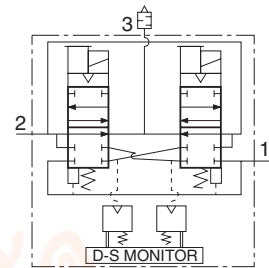
**Vlv. Resp. Time (msec) = M + F \* V**  
**M** = avg. time for parts movement  
**F** = msec. per cubic inch of volume  
**V** = volume in cubic inches

## 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.

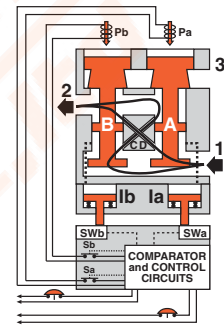


Valve Schematic



## 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 Ia and Ib, 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.

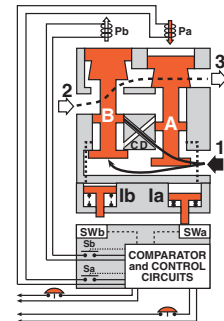


## Completion of Normal Cycle

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

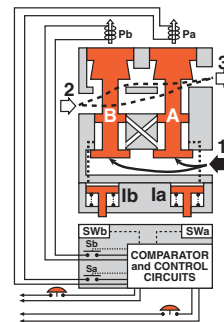
## Detecting a Malfunction

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 Ia 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.

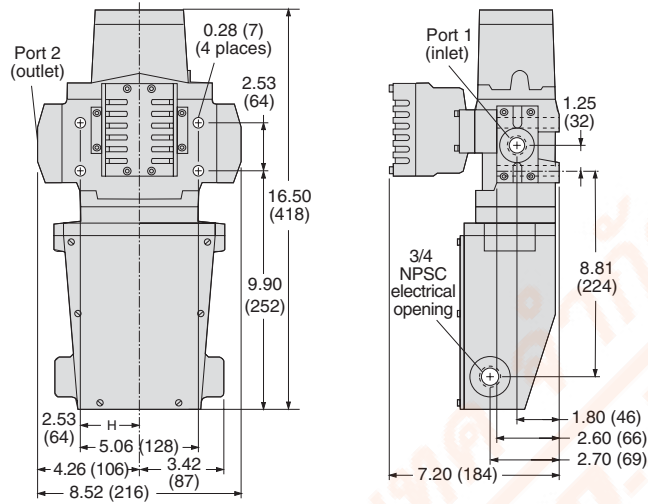
**WARNING:** If monitor must be reset, electrical signals to both solenoids must be removed to prevent the machine controlled by the valve from immediately recycling and producing a potentially hazardous condition.

# Valve Technical Data

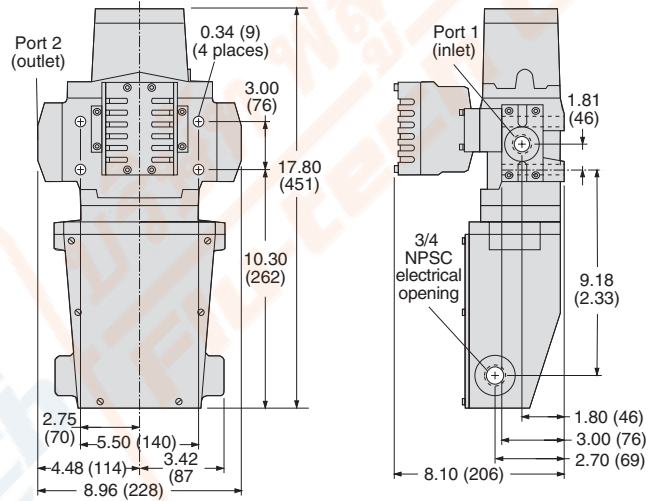
## DIMENSIONS

Inches (mm)

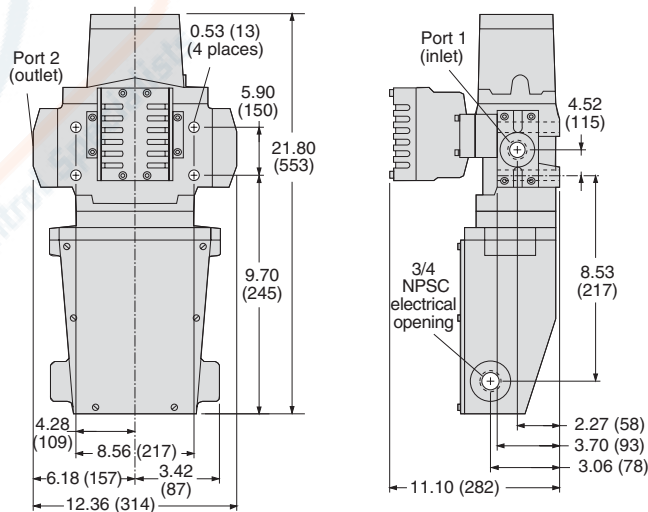
Basic Size 8



Basic Size 12



Basic Size 30



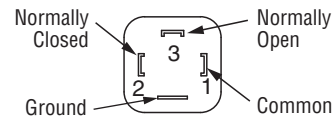
For additional information, and to assist you with piping and connectivity designs, our products are available in downloadable 2D and 3D CAD models in a wide range of formats at [www.rosscontrols.com](http://www.rosscontrols.com).

## 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

### Connectors Pinout

#### EN 175301-803 Mechanical Pressure Switch



## Accessories & Options

### REPLACEMENT VALVES

Valve without Piping Flanges	Port Size	Valve Basic Size	Voltage	Valve Model Number*			
				With Manual Overrides		Without Overrides	
				BSPP (G) Thread	NPT Thread	BSPP (G) Thread	NPT Thread
				1/2, 3/4, 1	8	24 V DC	D3573A4203W
		120 V DC	D3573A4203Z	3573A4203Z	D3573A4223Z	3573A4223Z	
3/4, 1, 1-1/4	12	24 V DC	D3573A5203W	3573A5203W	D3573A5223W	3573A5223W	
		120 V DC	D3573A5203Z	3573A5203Z	D3573A5223Z	3573A5223Z	
1-1/4, 1-1/2	30	24 V DC	D3573A7203W	3573A7203W	D3573A7223W	3573A7223W	
		120 V DC	D3573A7203Z	3573A7203Z	D3573A7223Z	3573A7223Z	

\* For other voltages, consult ROSS.

### CONNECTION PIPING KITS

Valve Piping Flange Kits	Port Size	Valve Basic Size	Kit Number*		Flange Quantity
			BSPP (G) Thread	NPT	
			1/2	8	
3/4	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.