



SAFE RETURN DUAL PRESSURE RSe SERIES VALVES



PRODUCT CATALOG

5/2 Control Reliable Double Valves Safe Return Dual Pressure RSe Series

Product Overview

Safety Function

The RSe Series valve safety function is to return the cylinder/actuator to its home “safe” position whenever a fault occurs within the valve.



Illustration example.

The 5/2 RSe Series valve can be utilized for Safe Return Dual Pressure Applications to control pressure in order to extend a cylinder with the supply pressure at port 3 and retract with the supply pressure at port 5. The fail-to-safe condition is also to retract. The safety function of the 5/2 RSe Series safe return dual pressure valve is to return the cylinder/actuator to its home “safe” position whenever a fault occurs within the valve by supplying pressure from port 5 to port 4 with port 2 being exhausted out of port 1 and the pressure supplied to port 3 is blocked. Using the RSe valve in a Safe Return Dual Pressure Application can reduce overall air consumption of a machine, and helps protect the environment. However, the RSe Series does this with the same level of control, up to Category 4, PL e, expected of the machine’s/system’s safety circuit.

The RSe Series valves are designed for external monitoring for safe, redundant operation of the valves. Such a monitoring system must be capable of inhibiting the operation of the valve. The RSe Series valves are constructed of redundant 5/2 spool type valves, and have an overall function of a single solenoid pilot-operated, spring return valve. Each single valve in the RSe Series is equipped with a PNP proximity sensor. Monitoring both of these sensors on each actuation and de-actuation of the RSe Series valve provides a diagnostic coverage of 99%. Monitoring of these sensors is to be done by an external monitoring system.

VALVE FEATURES

Redundant Control	Redundant control can achieve Category 4, PL e, when used with proper safety controls
External Monitoring	Each single valve in the RSe Series is equipped with a PNP proximity sensor. Monitoring both of these sensors on each actuation and de-actuation of the RSe Series valve provides a diagnostic coverage up to 99%. Monitoring of these sensors is to be done by an external monitoring system.
Spool Type Design	Redundant spool type valve with two operating solenoids that must be operated simultaneously in order to actuate the valve. In addition each valve element has a single, proximity sensor that is wired as a PNP type sensor for position sensing.
Valve Reset	Automatic reset by de-energizing the solenoids
Mounting	Base mounted – with NPT or G pipe threads. Inlet and outlet ports on both sides provide for flexible piping (plugs for unused ports included). Captive valve-to-base mounting screws.
SISTEMA Library	Available for download

These valves are not designed for controlling clutch/brake mechanisms on mechanical power presses, see DM[®] Series D double valves for mechanical power press applications.

PRODUCT CREDENTIALS

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

Specifications

STANDARD SPECIFICATIONS					
GENERAL	Function		5/2 Valve	Normally Closed	
	Construction Design		Dual Spool and Sleeve		
	Actuation	Electrical	Solenoid Pilot Controlled		
			Solenoid pilot operated with air assisted spring return One solenoid per valve element (2 total) – both to be operated synchronously		
	Mounting		Type	Base	
			Orientation	Any, preferably vertical	
	Connection		Threaded Port	NPT	
				G	
	Monitoring	External	Dynamic, cyclical, with customer supplied equipment; monitoring should check state of both valve position sensors with any and all changes in state of valve control signals		
Minimum Operation Frequency		Once per month, to ensure proper function			
Maximum Recommended Allowable Discordance Time		250 msec			
OPERATING CONDITIONS	Temperature		Ambient	40° to 120°F (4° to 50°C)	
			Media		
	Flow Media		Compressed air according to ISO 8573-1 Class 7:4:4		
	Pilot Supply		Internal or External		
	Operating Pressure	With Internal Pilot Supply		43 to 145 psig (3 to 10 bar)	
		With External Pilot Supply		0 to 145 psig (0 to 10 bar)	
	Pilot Supply Pressure	Internal		Must be minimum operating pressure	
External		Must be equal to or greater than inlet pressure, and meet minimum operating pressure			
ELECTRICAL DATA	Solenoids		Current Flow	Operating Voltage	Power Consumption (each solenoid)
			DC	24 volts	1.5 watts
			Rated for continuous duty		
			Design according to VDE 0580		
			Enclosure Rating		DIN 400 50 IP 65
			Electrical Connection	DIN EN 175301-803	Form C
	Pressure Sensors		PNP solid state		
			Current Consumption (each sensor)		<23mA (each without contacts)
Electrical Connection			M8		
CONSTRUCTION MATERIAL	Valve Body		Cast Aluminum		
	Spool		Stainless Steel		
	Seals		Buna-N		
SAFETY DATA	Functional Safety Data		Category	CAT 4, PL e	
			B ₁₀₀	20,000,000	
			PFH _D	7.71x10 ⁻⁹	
			MTTF _D	301.9 (n _{op} : 662400)	
	Vibration/Impact Resistance		Tested to DIN EN 60068-2-6		
IMPORTANT NOTE: Please read carefully and thoroughly all of the CAUTIONS, WARNINGS on the inside back cover.					

Ordering Information

MODEL NUMBER CONFIGURATOR

5-Way 2-Position Valves

RSe

6

E

D

A10

A

3

1

P

Series

Valve Function

Monitoring

Port Thread

Base Port Size

Sensor

Feedback

Reset Type

Voltage

5/2

External

NPT

G

In-Out

Exhaust

1/8

1/4

1/2

1/8

1/4

1/2

A10

B20

B40

N

D

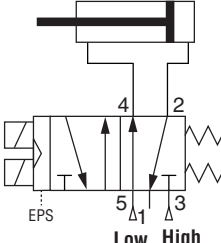
Sensor Output PNP

Sensor

Automatic

24 V DC

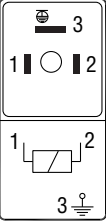
Model Number examples: RSe6EDA10A31P, RSe6ENB20A31P

Size		Flow C _v (NI/min)		Weight lb (Kg)	Simplified Schematic
Port 1, 2, 4	Port 3, 5	2-1	4-1		
1/8	1/8	0.9 (860)	0.7 (640)	2.9 (1.3)	 Plugs not included.
1/4	1/4	1.1 (1100)	0.8 (830)	3.7 (1.7)	
1/2	1/2	3.5 (3400)	1.8 (1700)	6.6 (2.99)	

Solenoid & Sensor Pinouts

Solenoid

DIN EN 175301-803 Form C



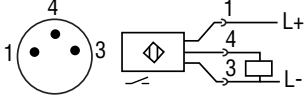
1 - Positive

2 - Negative

3 - Ground

Sensor

M8



1 - Common

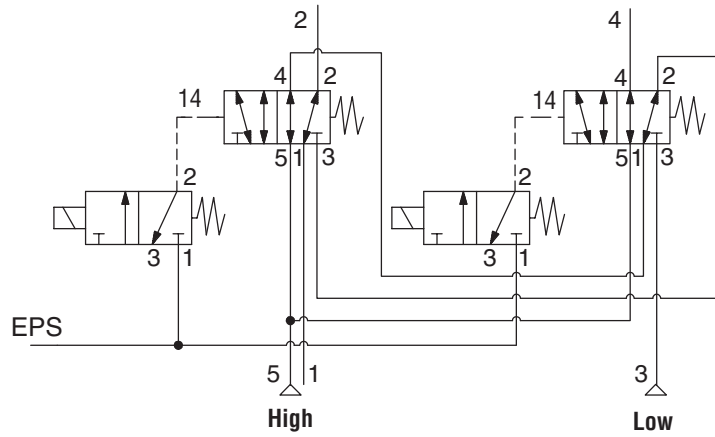
2 - Normally Closed

3 - Not Used

4

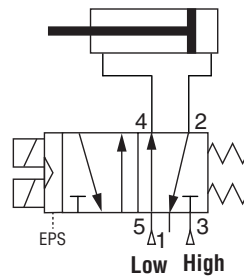
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Valve Schematic



Application Example

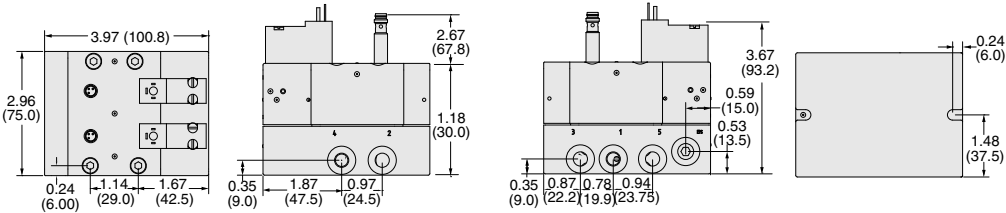
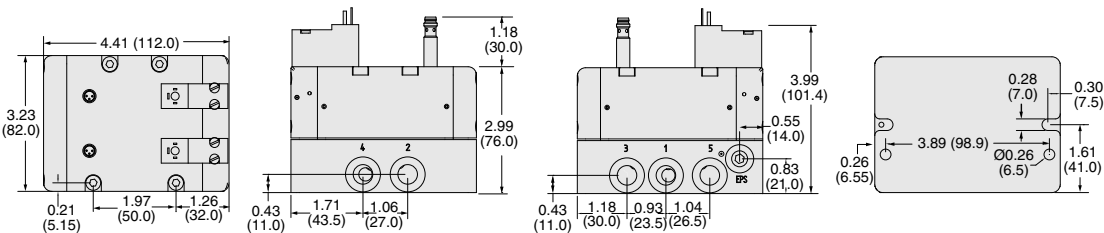
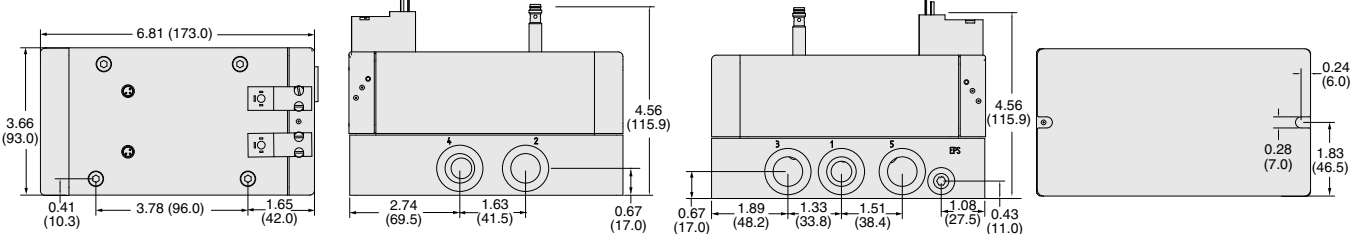
Typical Energy Saving Circuit

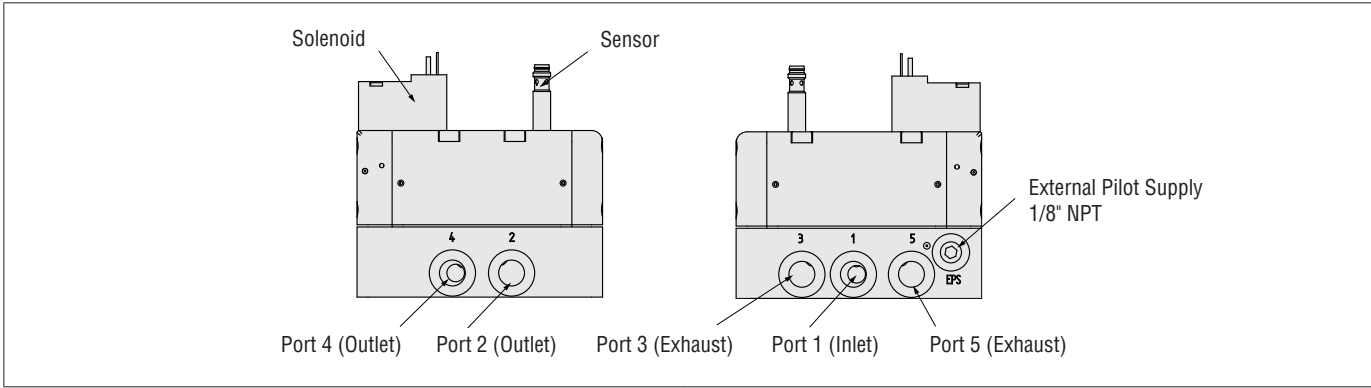


An integration Guide for RSe Series 5/2 valves is available from ROSS to provide information such as operation, monitoring, and integration into users control circuits.

[Integration Guide - 5/2 RSe Series Safe Return Double Valves](#)

Valve Technical Data

DIMENSIONS		Inches (mm)
Port Size 1/8		
		
Port Size 1/4		
		
Port Size 1/2		
		
Downloadable CAD models available.		

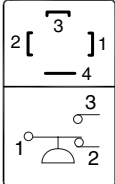


ENERGY RELEASE VERIFICATION

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)

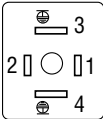
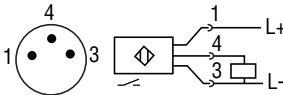
PREWIRED ELECTRICAL CONNECTORS

DIN EN 175301-803	M8
	

Illustration examples.

Prewired Connector Kit	Cable					Kit Number
	End 1	End 2	Connection	Quantity Included	Length meters (feet)	Without Light
	Connector	Cord				
	DIN EN 175301-803 Form C	Flying leads	Solenoid	2	2 (6.5)	2657B77
	M8	Flying leads	Sensor	2		

Prewired Connectors	Cable						Model Number	
	End 1	End 2	Connection	Quantity Included	Length meters (feet)	Cord Diameter mm	Without Light	Lighted Connector
	Connector	Cord						24 V DC
	DIN EN 175301-803 Form C	Flying leads	Solenoid	1	3 (10)	8	2449K77	2450K77-W
	M8	Flying leads	Sensor	1	2 (6.5)	–	249L74	–

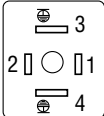
Connectors Pinout	
Solenoid	Sensor
DIN EN 175301-803 Form C	M8
 1 - Brown 2 - Blue 3 - Green/Yellow (Ground) 4 - Green/Yellow (Ground)	 1 - Common 2 - Normally Closed 3 - Not Used

ELECTRICAL CONNECTORS

Cable Grip	
Without Light	With Light
	

Illustration examples.

Connectors	Connector					Model Number	
	Type	Connection	Fitting Connection	Quantity Included	Cord Diameter mm	Without Light	Lighted Connector
							24 V DC
	DIN EN 175301-803 Form C	Solenoid	Cable grip	1	8 to 10	2452K77	2453K77-W

Connectors Pinout	
DIN EN 175301-803 Form C	
	1 - Brown 2 - Blue 3 - Green/Yellow (Ground) 4 - Green/Yellow (Ground)

EXHAUST SILENCERS



Illustration example.

Silencers	SPECIFICATIONS		Silencer Material		Pressure Range psig (bar)		Schematic	
			Aluminum		0-290 (0-20) maximum			
	Port Size	Thread Type	Flow C _v (NI/min)	Model Number		Dimensions inches (mm)		≈ Weight lb (kg)
				NPT Thread	R/Rp Thread	Length	Hex Size (D)	
	1/8	Male	1.3 (1300)	5500A1003	D5500A1003	2.0 (5)	0.81 (21)	0.07 (0.03)
	1/4	Male	2.3 (2300)	5500A2003	D5500A2003	2.2 (6)	0.81 (21)	
	1/2	Male	6.8 (6700)	5500A4003	D5500A4003	3.6 (9)	1.25 (32)	0.2 (0.1)

CAUTIONS, WARNINGS And STANDARD WARRANTY



ROSS OPERATING VALVE, ROSS CONTROLS®, ROSS DECCO®, and AUTOMATIC VALVE INDUSTRIAL, collectively the “ROSS Global Family”.

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 Global Family 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 Global Family 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 Global Family location.
4. Each ROSS Global Family Product should be used within its specification limits. In addition, use only ROSS Group components to repair ROSS Global Family 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 Global Family recommends a filter with a 5-micron rating for normal applications.
2. All standard ROSS Global Family 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 Global Family 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 Global Family's obligation under this warranty is limited to repair, replacement or refund of the purchase price paid for products which the ROSS Global Family 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 Global Family freight prepaid.

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