Directional Control Compact Valves
16 Series

Product Catalog

ROSS®
a global family

Direct Solenoid Pilot Controlled Valves 16 Series
Product Overview

ROSS® direct acting solenoid pilot valves provide reliable pilot control for various pneumatically actuated devices. Main valve actuation requires maintained pilot signal.

Illustration example.

VALVE FEATURES

"PACER" Pilot Valve	Compact design, proven for great reliability
Quick Response	Short-stroke, lightweight valve elements
Mounting Options	Inline or manifold mounting
High-shift Consistency	Designed for repeatability throughout the life of the valve

PRODUCT CREDENTIALS

Certificate of Compliance	Declaration of Conformity	

Specifications

STANDARD SPECIFICATIONS				
GENERAL	Function	3/2 Valve	Normally Closed	
			Normally Open	
		4/2 Valve		
	Construction Design	Poppet		
	Actuation	Electrical	Direct Acting - Solenoid Pilot Controlled	
	Mounting	Inline		
		Manifold		
	Connection	Threaded Port	NPT	
			G	
	Manual Override	Flush-rubber; non-locking		
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	3/2 Valves	5 to 150 psig (0.3 to 10.3 bar)	
		4/2 Valves	30 to 150 psig (2 to 10.3 bar)	
ELECTRICAL DATA FOR SOLENOID PILOT	Solenoids	Current Flow	Power Consumption	Operating Voltage (each solenoid)
		DC	24 volts	14 watts
		AC	110-120 volts, 50/60 Hz	87 VA inrush, 30 VA holding
			230-240 volts, 60 Hz	
		Rated for continuous duty		
CONSTRUCTION MATERIAL	Valve Body	Cast Aluminum		
	Poppet	Acetal		
	Seals	Buna-N		

IMPORTANT NOTE: Please read carefully and thoroughly all of the CAUTIONS, WARNINGS on the inside back cover.

Ordering Information

3/2 Solenoid Pilot Controlled Inline Valves

SOLENOID PILOT CONTROLLED VALVES — **3-Way 2-Position Valves**

Port Size		Valve Type	Valve Model Number *					
			NPT Thread			G Thread		
In-Out	Exhaust		24 V DC	110-120 V AC	230 V AC	24 V DC	110-120 V AC	230 V AC
1/8	1/2	Normally Closed	1613B1020W	1613B1020Z	1613B1020Y	D1613B1020W	D1613B1020Z	D1613B1020Y
		Normally Open	1614B1020W	1614B1020Z	1614B1020Y	D1614B1020W	D1614B1020Z	D1614B1020Y
1/4	1/2	Normally Closed	1613B2020W	1613B2020Z	1613B2020Y	D1613B2020W	D1613B2020Z	D1613B2020Y
		Normally Open	1614B2020W	1614B2020Z	1614B2020Y	D1614B2020W	D1614B2020Z	D1614B2020Y

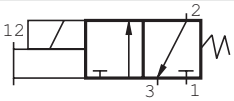
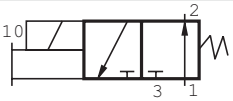
* For other voltages, consult ROSS.

Size		Flow C_v (Nl/min)		Average Response Constants #			Weight ≈ lb (kg)
					F		
Port 1, 2	Port 3	Normally Closed (NC)	Normally Open (NO)	M	NC	NO	
1/8	1/2	0.3 (30)	0.3 (30)	5	2.90	2.90	1.4 (0.6)
1/4							

 # Valve Response Time – Response Time (msec) = M + (F • V). This is the average time required to fill a volume V (cubic inches) to 90% of supply pressure or to exhaust it to 10% of supply pressure. M and F values are shown above.

Valve Schematics

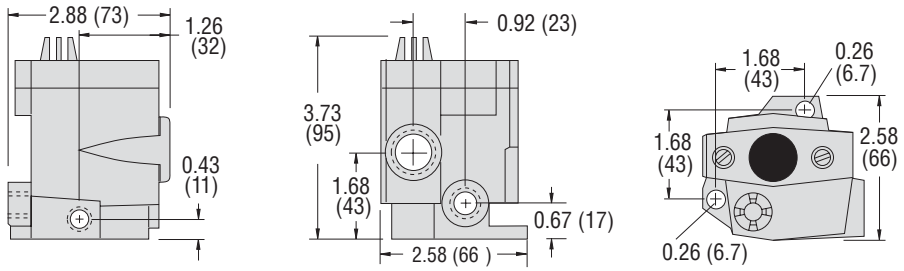
3/2 Valve

Normally Closed	Normally Open
	

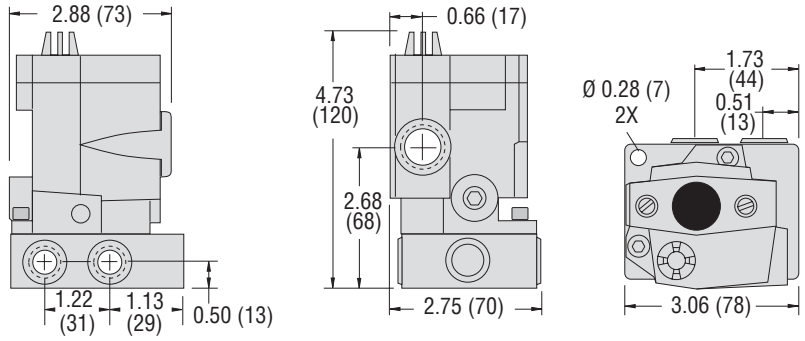
3/2 & 4/2 Solenoid Pilot Controlled Inline Valves

DIMENSIONS — Inches (mm)

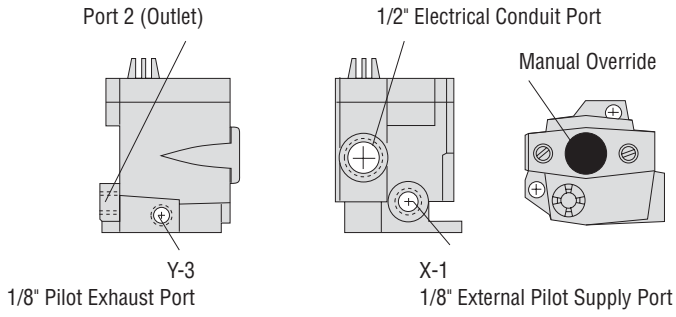
3/2 Valve



4/2 Valve



Downloadable CAD models available.



Ordering Information

4/2 Solenoid Pilot Controlled Inline Valves

SOLENOID PILOT CONTROLLED VALVES — 4-Way 2-Position Valves

Port Size		Valve Model Number *					
In-Out	Exhaust	NPT Thread			G Thread		
		24 V DC	110-120 V AC	230 V AC	24 V DC	110-120 V AC	230 V AC
1/4	1/2	1616C2020W	1616C2020Z	1616C2020Y	D1616C2020W	D1616C2020Z	D1616C2020Y

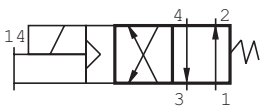
* For other voltages, consult ROSS.

Size		Flow C_v (Nl/min)		Average Response Constants #			Weight ≈ lb (kg)
Port 1, 2, 4	Port 3	1-2	2-4	M	F		
1/4	1/2	0.3 (30)	0.3 (30)	5	2.90	2.90	2.4 (1.1)

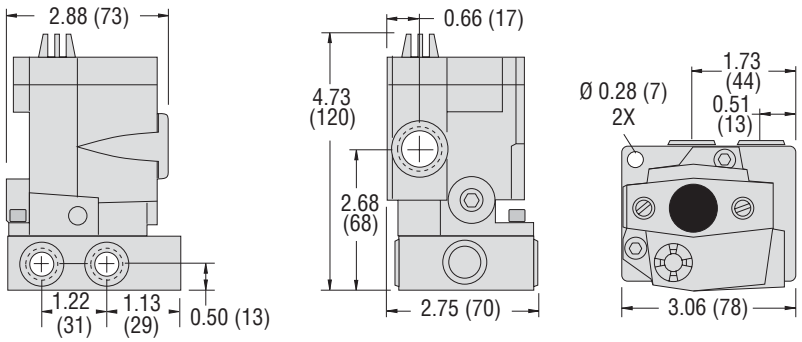
 # Valve Response Time – Response Time (msec) = M + (F • V). This is the average time required to fill a volume V (cubic inches) to 90% of supply pressure or to exhaust it to 10% of supply pressure. M and F values are shown above.

Valve Schematics

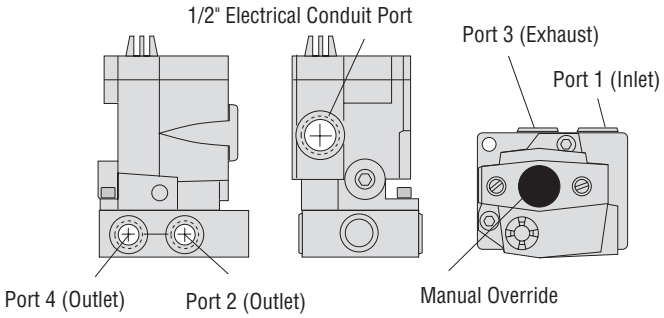
4/2 Valve



4/2 Solenoid Pilot Controlled Inline Valves

DIMENSIONS	Inches (mm)
4/2 Valve	

Downloadable CAD models available.



Ordering Information

3/2 Solenoid Pilot Controlled Valves & Manifold Stations

SOLENOID PILOT CONTROLLED VALVES — 3-Way 2-Position Valves

Port Size		Valve Type	Valve Model Number*					
			NPT Thread			G Thread		
In-Out	Exhaust		24 V DC	110-120 V AC	230 V AC	24 V DC	110-120 V AC	230 V AC
1/4	1/2	Normally Closed	1613C2322W	1613C2322Z	1613C2322Y	D1613C2322W	D1613C2322Z	D1613C2322Y
		Normally Open	1614C2322W	1614C2322Z	1614C2322Y	D1614C2322W	D1614C2322Z	D1614C2322Y

For other voltages, consult ROSS.

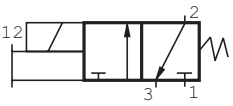
*** Manifold station ordered separately, please see ordering information below.**

Size		Flow C_v (Nl/min)		Average Response Constants #			Weight ≈ lb (kg)
					F		
Port 1, 2	Port 3	Normally Closed (NC)	Normally Open (NO)	M	NC	NO	
1/4	1/2	0.3 (30)	0.3 (30)	5	2.90	2.90	2.4 (1.1)

 # Valve Response Time – Response Time (msec) = M + (F • V). This is the average time required to fill a volume V (cubic inches) to 90% of supply pressure or to exhaust it to 10% of supply pressure. M and F values are shown above.

SINGLE STATION MANIFOLD

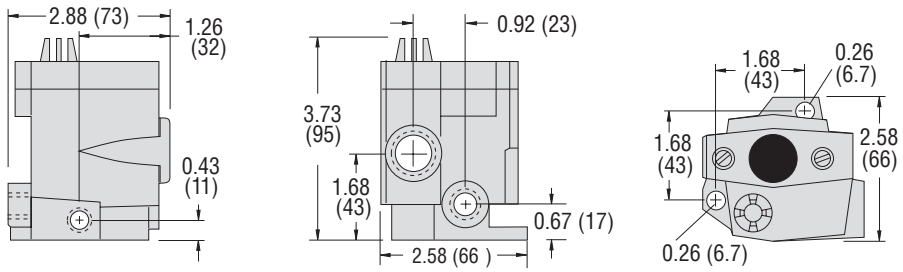
Port Size		Manifold Station Model Number	
In-Out	Exhaust	NPT Thread	G Thread
1/4	1/2	256B91	D256B91

Valve Schematics	
Normally Closed	Normally Open
	

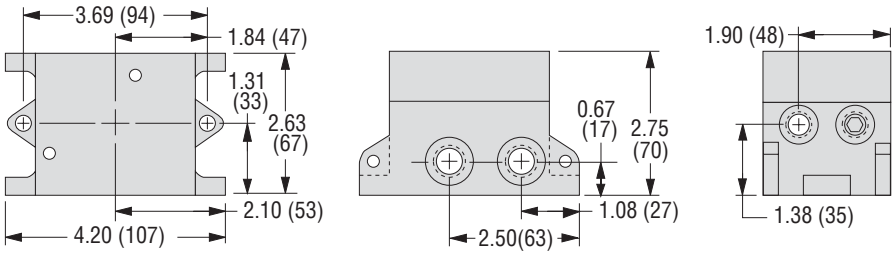
3/2 Solenoid Pilot Controlled Valves & Manifolds

DIMENSIONS — Inches (mm)

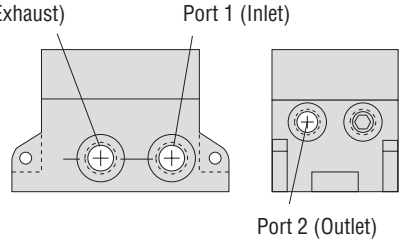
Valve



Single Station Manifold



Downloadable CAD models available.



Ordering Information

4/2 Solenoid Pilot Controlled Valves & Manifold Stations

SOLENOID PILOT CONTROLLED VALVES — 4-Way 2-Position Valves

Port Size		Valve Model Number*					
In-Out	Exhaust	NPT Thread			G Thread		
		24 V DC	110-120 V AC	230 V AC	24 V DC	110-120 V AC	230 V AC
1/4	1/2	1616C2322W	1616C2322Z	1616C2322Y	D1616C2322W	D1616C2322Z	D1616C2322Y

For other voltages, consult ROSS.

*** Manifold station ordered separately, please see ordering information below.**

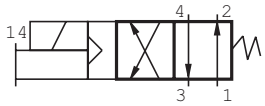
Size		Flow C_v (Nl/min)		Average Response Constants #			Weight ≈ lb (kg)
Port 1, 2, 4	Port 3	Normally Closed (NC)	Normally Open (NO)	M	F		
					NC	NO	
1/4	1/2	0.3 (30)	0.3 (30)	5	2.90	2.90	2.4 (1.1)

 # Valve Response Time – Response Time (msec) = M + (F • V). This is the average time required to fill a volume V (cubic inches) to 90% of supply pressure or to exhaust it to 10% of supply pressure. M and F values are shown above.

SINGLE STATION MANIFOLD

Port Size		Manifold Station Model Number	
In-Out	Exhaust	NPT Thread	G Thread
1/4	1/2	257B91	D257B91

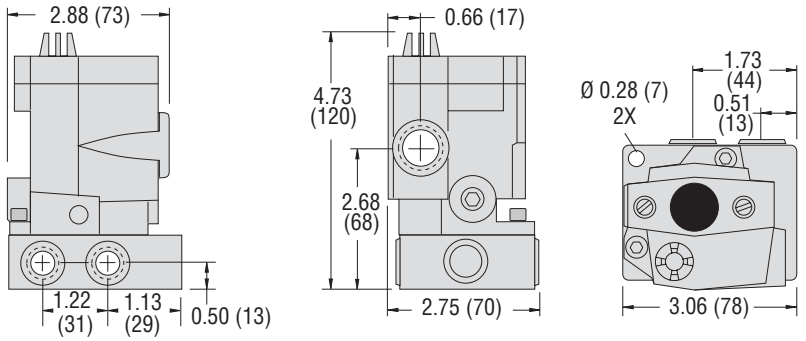
Valve Schematic



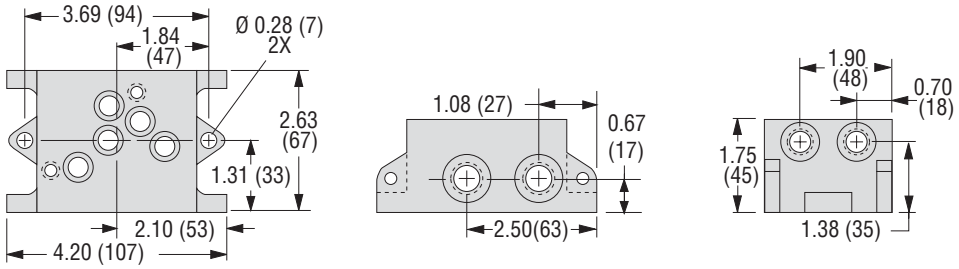
4/2 Solenoid Pilot Controlled Valves & Manifolds

DIMENSIONS — Inches (mm)

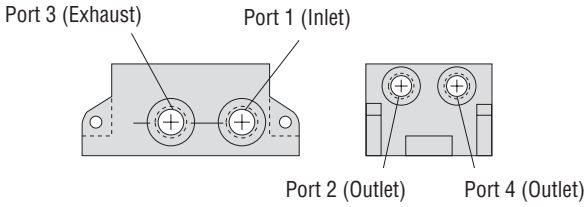
Valve



Single Station Manifold



Downloadable CAD models available.



EXHAUST SILENCERS

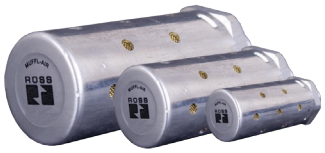
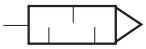


Illustration example.

Silencers

SPECIFICATIONS	Silencer Material	Pressure Range psig (bar)	Schematic
	Aluminum	0-290 (0-20) maximum	

Port Size	Thread Type	Flow C_v (Nl/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)		

SOLENOID PILOT INDICATOR LIGHT KITS

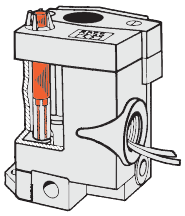


Illustration example.

	Kit Number		
Indicator Light Kits	**24 V DC**	**110-120 V AC, 50-60 Hz**	**230 V AC, 50-60 Hz**
	862K87-W	862K87-Z	862K87-Y
	To visually verify valve operation, indicator light kits are available for single solenoid models. Indicator lights are standard on double solenoid valves. The indicator light is illuminated when the solenoid is energized.		

SOLENOID PILOT MANUAL OVERRIDE KITS

Flush Button	Extended Button	Extended Button with Palm
		

Illustration examples.

	Manual Override Type	Kit Number	
		Locking Type	**Non-Locking Type**
Manual Override Kits	Flush Button	792K87	790K87
	Extended Button	–	791K87
	Extended Button with Palm	–	984H87
	Flush rubber button, non-locking manual override is standard on solenoid models. Each of the buttons in the override kits is made of metal and is spring-returned. The locking type button, however, can be kept in the actuated position by turning the slot in the top of the button with a screwdriver.		

Notes

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 FamilyProducts.

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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