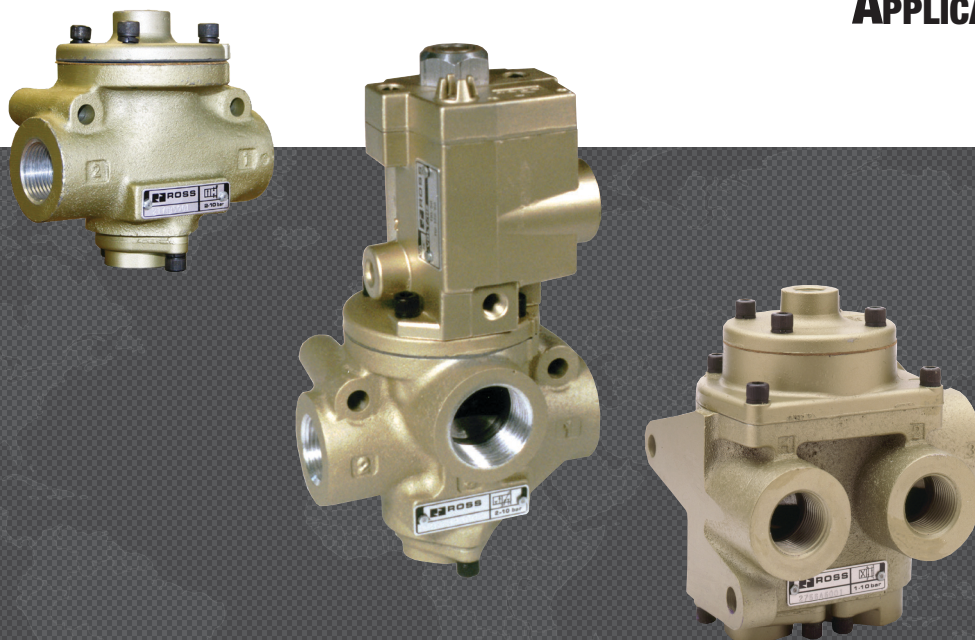




DIRECTIONAL CONTROL HEADLINE VALVES 21 SERIES

PRODUCT CATALOG

**HIGH TEMPERATURE AND LOW TEMPERATURE
APPLICATIONS**



Headline Poppet Valves 21 Series

Product Overview

High Temperature and Low Temperature Applications

Directional Control Function

Directional control valves function is to control the direction of flow in the pneumatic circuit. Directional control valves are able to control the way the air passes. These valves can regulate the airflow being capable to stop fluid flow, allow fluid flow, and change the direction of fluid flow. These three functions usually operate in combination.

Solenoid Pilot Controlled	Pressure Controlled
	

Illustration examples.

VALVE FEATURES

Poppet Design	Poppet construction for high dirt tolerance Valves are designed with metal internals and special seals appropriate for use in more extreme temperatures
Mounting Options	Can be mounted close to actuator, reducing length of pipe to be pressurized/exhausted on each cycle
Pilot Supply	Internal or external; easily field-convertible for use with an external pilot supply
High Velocity	Near zero leakage
Positive Sealing	No sliding action to prevent damage and wear
Reliability	Consistent response times over the life of the valve

Valve models for external pilot supply available, consult ROSS.

Explosion-Proof solenoid pilot valves available, see valves for Hazardous Locations.

For ATEX certified valves order placement, consult ROSS.



Actuation	Available Inlet Port Sizes									Functions			Maximum Flow C _v	Page
	1/4	3/8	1/2	3/4	1	1-1/4	1-1/2	2	2-1/2	2/2	3/2	4/2		
Solenoid Pilot Controlled	●	●	●	●	●	●	●	●	●	●	●		40	3 – 9
Pressure Controlled	●	●	●	●	●	●	●			●	●	●	40	10 – 15
Accessories and Options														16

STANDARD SPECIFICATIONS

GENERAL	Function		2/2, 3/2, and 4/2 Valve
	Construction Design		Poppet
	Actuation		Electrical – Solenoid Pilot Controlled Pneumatic – Pressure Controlled
	Mounting	Type	Inline
		Orientation	Any, preferably vertical
	Connection		Threaded; G, NPT
	Manual Override		Non-locking metal button, standard
	Minimum Operation Frequency		Once per month, to ensure proper function

OPERATING CONDITIONS	Temperature	Solenoid Pilot Controlled	High Temperature	Ambient	0° to 250°F (-17° to 122°C)
				Media	0° to 300°F (-17° to 150°C)
			Low Temperature	Ambient	-40° to 120°F (-40° to 50°C)
				Media	-40° to 175°F (-40° to 80°C)
				For temperatures below 40°F (4°C) air must be free of water vapor to prevent formation of ice.	
		Pressure Controlled	High Temperature	Ambient	0° to 300°F (-17° to 150°C)
				Media	0° to 300°F (-17° to 150°C)
			Low Temperature	Ambient	-40° to 175°F (-40° to 80°C)
				Media	-40° to 175°F (-40° to 80°C)
	For temperatures below 40°F (4°C) air must be free of water vapor to prevent formation of ice.				
	Flow Media		Filtered air		
	Operating Pressure		30 to 150 psig (2 to 10 bar)		
	External Pilot Supply		Must be equal to or greater than inlet pressure		

ELECTRICAL DATA FOR SOLENOID PILOT	Solenoids		Rated for continuous duty		
	Operating Voltage (each solenoid)		24 volts DC 110-120 volts AC, 50/60 Hz 230-240 volts AC, 60 Hz		
	Power Consumption		24 V DC – 14 watts 110-120 V AC – 87 VA inrush, 30 VA holding 230-240 V AC – 87 VA inrush, 30 VA holding		

CONSTRUCTION MATERIAL	Valve Body		Cast Aluminum
	Poppet		Aluminum and Stainless Steel
	Seals	High Temperature	Fluorocarbon
		Low Temperature	Buna-N

SAFETY DATA	Safety Integrity Level (SIL)	Certified by TÜV Rheinland in accordance to IEC 61508 and IEC 61511 safety integrity level 2 (SIL 2) and EN ISO 13849-1, PL c (with application specific diagnosis) in singular application with HFT = 0 and SIL 3 and PL e in redundant application with HFT ≥ 1, for details see certificate.
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IMPORTANT NOTE: Please read carefully and thoroughly all of the CAUTIONS, WARNINGS on the inside back cover.

PRODUCT CREDENTIALS

SIL Safety Integrity Level	CE Conformity Declaration	EAC Conformity Declaration	CSA Certificate of Compliance	CRN Certification
				Available for appropriately tested valves

Ordering Information

2/2 Solenoid Pilot Controlled Valves

MODEL NUMBER CONFIGURATOR 2-Way 2-Position Valves

Thread

G **D**

NPT **Leave Blank**

Series

21

7

1

B

200

1

W

Revision Level

1

Actuation

Solenoid Controlled

Valve Function

2/2

Normally Closed **1**

Normally Open **2**

Voltage*

24 volts DC **W**

110-120 volts AC, 50/60 Hz **Z**

230-240 volts AC, 60 Hz **Y**

* For other voltages consult ROSS.

Application

High Temperature
0° to 250°F (-17° to 122°C) **1**

Low Temperature
-40° to 120°F (-40° to 50°C) **2**

Size

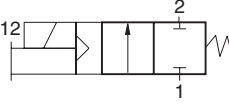
Body	Port 1	Port 2	
3/8	1/4	1/4	200
	3/8	3/8	300
	1/2	1/2	401
3/4	1/2	1/2	400
	3/4	3/4	500
	1	1	601
1-1/4	1	1	600
	1-1/4	1-1/4	700
	1-1/2	1-1/2	801

Size			Flow C _v		Average Response Constants*			Weight lb (kg)
Body	Port 1	Port 2	Normally Closed	Normally Open	M	F		
			1-2	1-2		Normally Closed	Normally Open	
3/8	1/4	1/4	2.3	2.3	10	0.96	0.96	3.0 (1.4)
	3/8	3/8	3.8	3.3	10	0.90	0.93	
	1/2	1/2	4.0	3.5	10	0.82	0.88	
3/4	1/2	1/2	7.7	6.5	14	0.39	0.50	3.3 (1.5)
	3/4	3/4	9.0	7.3	14	0.32	0.37	
	1	1	9.0	7.9	14	0.31	0.36	
1-1/4	1	1	24	21	26	0.19	0.20	7.5 (3.4)
	1-1/4	1-1/4	29	20	26	0.14	0.18	
	1-1/2	1-1/2	29	21	26	0.13	0.17	

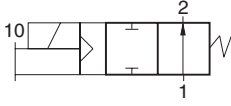
Valve Response Time – Response Time (msec) = M + (F • V). This is the average time required to fill a volume V (cubic inches) to 90% of supply pressure or to exhaust it to 10% of supply pressure. M and F values are shown above.

Valve Schematic

Normally Closed



Normally Open



Solenoid Pilot

Y-3

1/8" Pilot Exhaust Port

Port 2 (Outlet)

Port 1 (Inlet)

1/2 Electrical Conduit Port

X-1

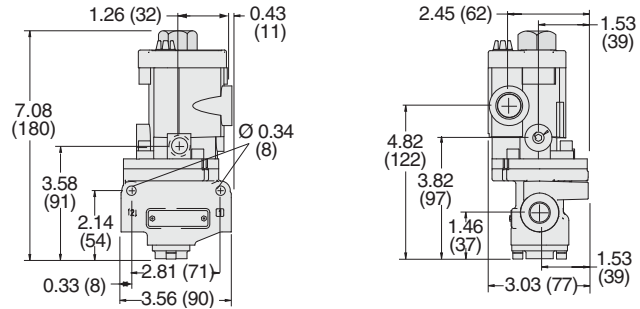
1/8" External Pilot Supply

2/2 Solenoid Pilot Controlled Valves

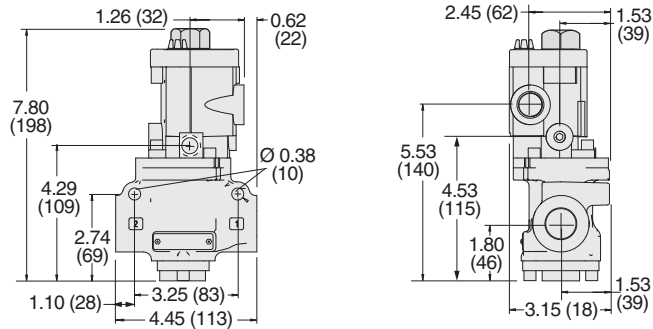
DIMENSIONS

Inches (mm)

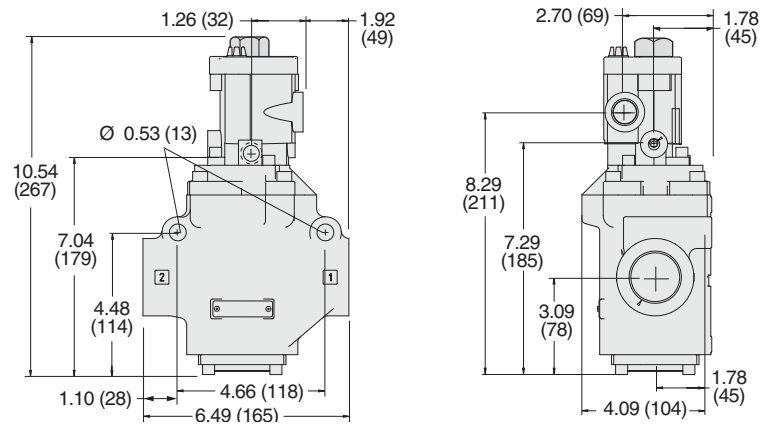
Body Size 3/8



Body Size 3/4



Body Size 1-1/4



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Ordering Information

3/2 Solenoid Pilot Controlled Valves

MODEL NUMBER CONFIGURATOR 3-Way 2-Position Valves

Thread

G D

NPT Leave Blank

Series

21

7

3

B

200

1

W

Revision Level

Actuation

Solenoid Controlled

Valve Function

3/2

Normally Closed 3

Normally Open 4

Size

Body	Port 1	Port 2	
3/8	1/4	1/4	200
	3/8	3/8	300
	1/2	1/2	401
3/4	1/2	1/2	400
	3/4	3/4	500
	1	1	601
1-1/4	1	1	600
	1-1/4	1-1/4	700
	1-1/2	1-1/2	801

Voltage*

24 volts DC W

110-120 volts AC, 50/60 Hz Z

230-240 volts AC, 60 Hz Y

* For other voltages consult ROSS.

Application

High Temperature 0° to 250°F (-17° to 122°C) 1

Low Temperature -40° to 120°F (-40° to 50°C) 2

Size				Flow C _v				Average Response Constants*					Weight lb (kg)
Body	Port 1	Port 2	Port 3	Normally Closed		Normally Open		M	F				
									Normally Closed		Normally Open		
				1-2	2-3	1-2	2-3		1-2	2-3	1-2	2-3	
3/8	1/4	1/4	1/2	2.4	3.4	2.0	2.1	10	1.76	2.08	1.60	2.30	3.0 (1.4)
	3/8	3/8	1/2	3.0	5.8	2.3	2.4	10	0.95	1.07	1.03	1.60	
	1/2	1/2	1/2	3.0	5.2	2.9	2.8	10	0.94	0.98	11.00	2.00	
3/4	1/2	1/2	1	6.6	12	6.5	7.0	11	0.58	0.64	0.50	0.70	3.3 (1.5)
	3/4	3/4	1	7.8	13	7.5	7.5	11	0.38	0.41	0.43	0.67	
	1	1	1	7.5	12	7.7	7.6	11	0.24	0.36	0.42	0.60	
1-1/4	1	1	1-1/2	24	40	15	17	28	0.16	0.18	0.17	0.20	7.5 (3.4)
	1-1/4	1-1/4	1-1/2	29	39	21	23	28	0.12	0.17	0.15	0.19	
	1-1/2	1-1/2	1-1/2	30	38	22	23	28	0.12	0.16	0.13	0.18	

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 Schematic

Normally Closed

Normally Open

Solenoid Pilot

Y-3

1/8" Pilot Exhaust Port

Port 3 (Exhaust)

Port 2 (Outlet)

Port 1 (Inlet)

1/2" Electrical Conduit Port

X-1

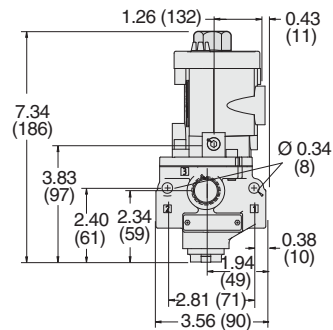
1/8" External Pilot Supply Port

3/2 Solenoid Pilot Controlled Valves

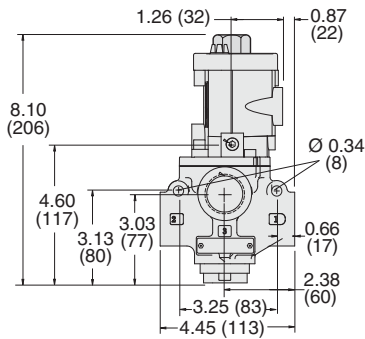
DIMENSIONS

Inches (mm)

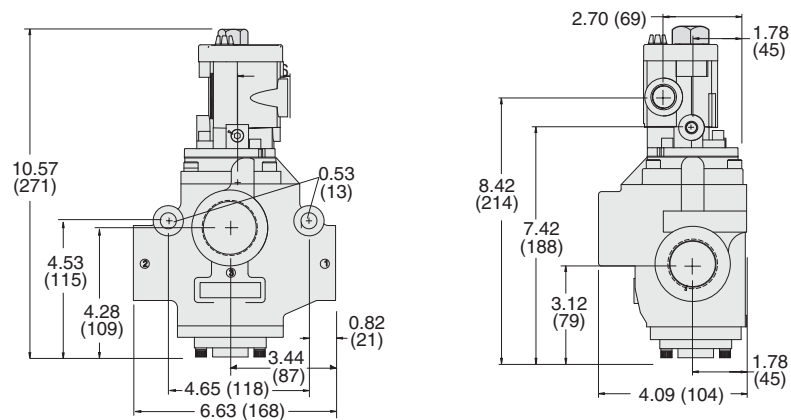
Body Size 3/8



Body Size 3/4



Body Size 1-1/4



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Ordering Information

4/2 Solenoid Pilot Controlled Valves

MODEL NUMBER CONFIGURATOR

4-Way 2-Position Valves

Thread

G D

NPT Leave Blank

Series

21

7

6

B

200

1

W

Actuation

Solenoid Controlled

Revision Level

Valve Function

4/2

Size

Body	Port 1	Port 2	
3/8	1/4	1/4	200
	3/8	3/8	300
	1/2	1/2	401
3/4	1/2	1/2	400
	3/4	3/4	500
	1	1	601
1-1/4	1	1	600
	1-1/4	1-1/4	700
	1-1/2	1-1/2	801

Voltage*

24 volts DC	W
110-120 volts AC, 50/60 Hz	Z
230-240 volts AC, 60 Hz	Y

* For other voltages consult ROSS.

Application

High Temperature 0° to 250°F (-17° to 122°C)	1
Low Temperature -40° to 120°F (-40° to 50°C)	2

Size				Flow C _v		Average Response Constants*			Weight lb (kg)
Body	Port 1	Port 2, 4	Port 3	1-2, 1-4	4-3, 2-3	M	F		
							1-2, 1-4	4-3, 2-3	
3/8	1/4	1/4	1/2	2.1	2.2	30	1.70	2.28	3.0 (1.4)
	3/8	3/8	1/2	2.5	3.1	30	1.13	1.33	
	1/2	1/2	1/2	2.9	3.8	30	1.00	1.22	
3/4	1/2	1/2	1	5.7	6.5	46	0.50	0.76	5.8 (2.6)
	3/4	3/4	1	7.1	8.7	46	0.36	0.55	
	1	1	1	7.7	10	46	0.36	0.50	
1-1/4	1	1	1-1/2	18	23	99	0.19	0.22	12.0 (5.4)
	1-1/4	1-1/4	1-1/2	20	28	99	0.19	0.22	
	1-1/2	1-1/2	1-1/2	21	29	99	0.16	0.22	

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 Schematic

Solenoid Pilot

X-1

1/8" External Pilot Supply Port

Port 3 (Exhaust)

1/2" Electrical Conduit Port

Y-3

1/8" Pilot Exhaust Port

Port 4 (Outlet)

Port 2 (Outlet)

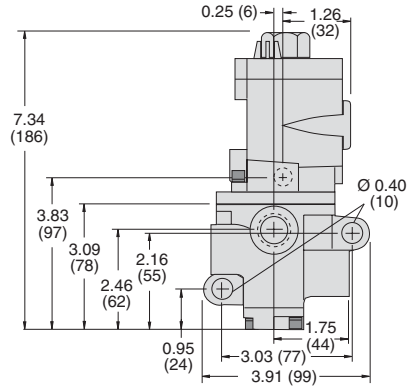
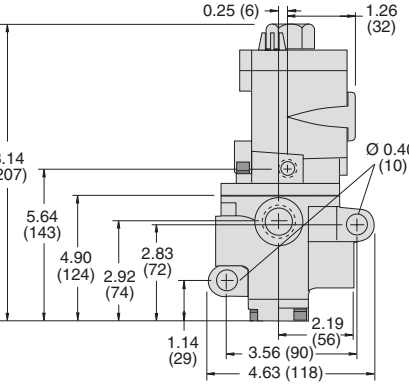
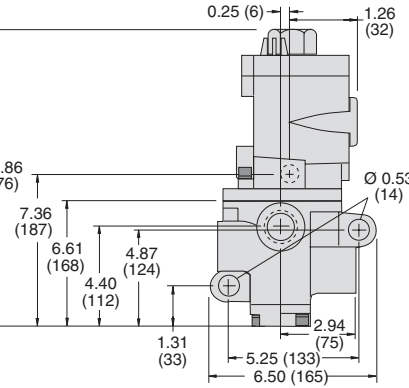
Port 1 (Inlet)

Valve Technical Data

4/2 Solenoid Pilot Controlled Valves

DIMENSIONS – 4/2 VALVES

Inches (mm)

Body Size 3/8	
Body Size 3/4	
Body Size 1-1/4	

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Ordering Information

2/2 Pressure Controlled Valves

MODEL NUMBER CONFIGURATOR 2-Way 2-Position Valves

Thread

G D

NPT Leave Blank

Series

21

5

1

B

200

1

Revision Level

Application

High Temperature
0° to 300°F (-17° to 150°C) 1

Low Temperature
-40° to 175°F (-40° to 80°C) 2

Actuation

Solenoid Controlled

Valve Function

2/2

Normally Closed 1

Normally Open 2

Size

Body	Port 1	Port 2	
3/8	1/4	1/4	200
	3/8	3/8	300
	1/2	1/2	401
3/4	1/2	1/2	400
	3/4	3/4	500
	1	1	601
1-1/4	1	1	600
	1-1/4	1-1/4	700
	1-1/2	1-1/2	801

Size			Flow C _v		Average Response Constants*			Weight lb (kg)
Body	Port 1	Port 2	Normally Closed	Normally Open	M	F		
			1-2	1-2		Normally Closed	Normally Open	
3/8	1/4	1/4	2.3	2.3	10	0.91	0.91	1.8 (0.8)
	3/8	3/8	3.8	3.3	10	0.70	0.76	1.8 (0.8)
	1/2	1/2	4.0	3.5	10	0.64	0.72	1.8 (0.8)
3/4	1/2	1/2	7.7	6.5	16	0.37	0.43	4.2 (2.0)
	3/4	3/4	9.0	7.3	16	0.34	0.39	4.2 (2.0)
	1	1	9.0	7.9	16	0.34	0.37	4.2 (2.0)
1-1/4	1	1	24	21	27	0.17	0.17	11.0 (5.0)
	1-1/4	1-1/4	29	20	27	0.19	0.19	11.0 (5.0)
	1-1/2	1-1/2	29	21	27	0.18	0.18	11.0 (5.0)

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 Schematic

Normally Closed

Normally Open

1/4" Signal Port

Port 2 (Outlet)

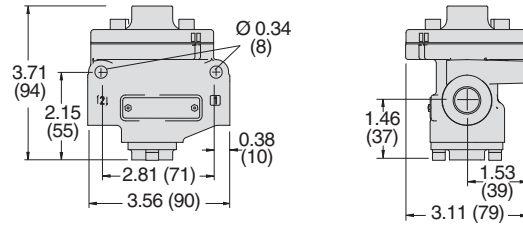
Port 1 (Inlet)

2/2 Pressure Controlled Valves

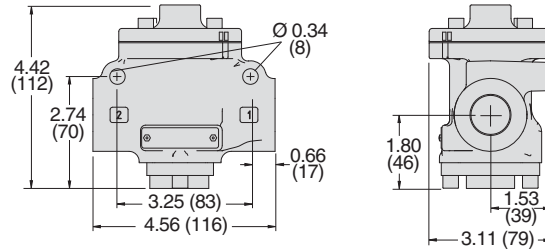
DIMENSIONS

Inches (mm)

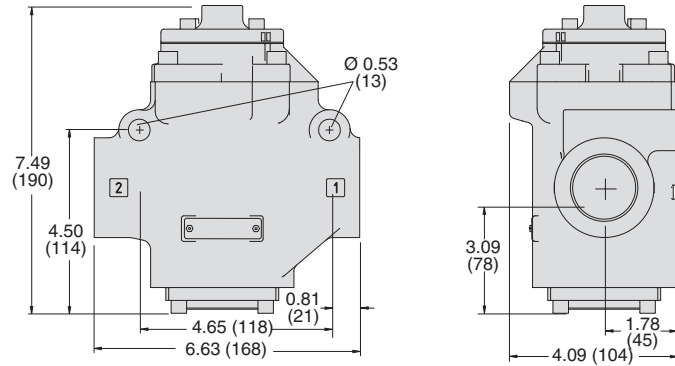
Body Size 3/8



Body Size 3/4



Body Size 1-1/4



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Ordering Information

3/2 Pressure Controlled Valves

MODEL NUMBER CONFIGURATOR 3-Way 2-Position Valves

Thread

G D

NPT Leave Blank

Series

21

5

3

B

2001

Actuation

Pressure Controlled

Valve Function

3/2

Normally Closed 3

Normally Open 4

Revision Level

Size

Body	Port 1	Port 2	Port 3	
3/8	1/4	1/4	1/2	2001
	3/8	3/8	1/2	3001
	1/2	1/2	1/2	4011
3/4	1/2	1/2	1	4001
	3/4	3/4	1	5001
	1	1	1	6011
1-1/4	1	1	1-1/2	6001
	1-1/4	1-1/4	1-1/2	7001
	1-1/2	1-1/2	1-1/2	8011
2	1-1/2	1-1/2	2-1/2	8001
	2	2	2-1/2	9001
	2-1/2	2-1/2	2-1/2	9011

Size				Flow C _V				Average Response Constants*					Weight lb (kg)
Body	Port 1	Port 2	Port 3	Normally Closed		Normally Open		M	F				
									Normally Closed		Normally Open		
				1-2	2-3	1-2	2-3		1-2	2-3	1-2	2-3	
3/8	1/4	1/4	1/2	2.4	3.4	2.0	2.1	10	1.76	2.08	1.60	2.30	1.8 (0.8)
	3/8	3/8	1/2	3.0	5.8	2.3	2.4	10	0.95	1.07	1.03	1.60	1.8 (0.8)
	1/2	1/2	1/2	3.0	5.2	2.9	2.8	10	0.94	0.98	11.00	2.00	1.8 (0.8)
3/4	1/2	1/2	1	6.6	12	6.5	7.0	11	0.58	0.64	0.50	0.70	4.5 (2.1)
	3/4	3/4	1	7.8	13	7.5	7.5	11	0.38	0.41	0.43	0.67	4.5(2.1)
	1	1	1	7.5	12	7.7	7.6	11	0.24	0.36	0.42	0.60	4.5 (2.1)
1-1/4	1	1	1-1/2	24	40	15	17	28	0.16	0.18	0.17	0.20	11.0 (5.0)
	1-1/4	1-1/4	1-1/2	29	39	21	23	28	0.12	0.17	0.15	0.19	11.0 (5.0)
	1-1/2	1-1/2	1-1/2	30	38	22	23	28	0.12	0.16	0.13	0.18	11.0 (5.0)

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 Schematic

Normally Closed

Normally Open

1/4" Signal Port

Port 3 (Exhaust)

Port 2 (Outlet)

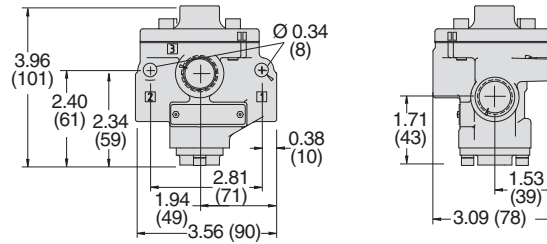
Port 1 (Inlet)

3/2 Pressure Controlled Valves

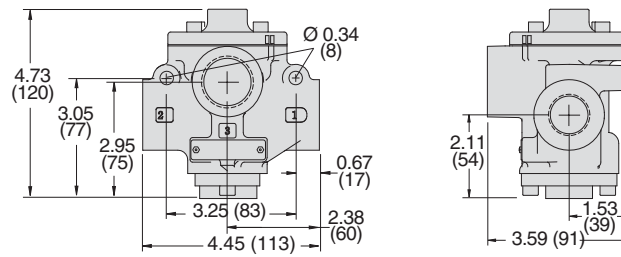
DIMENSIONS

Inches (mm)

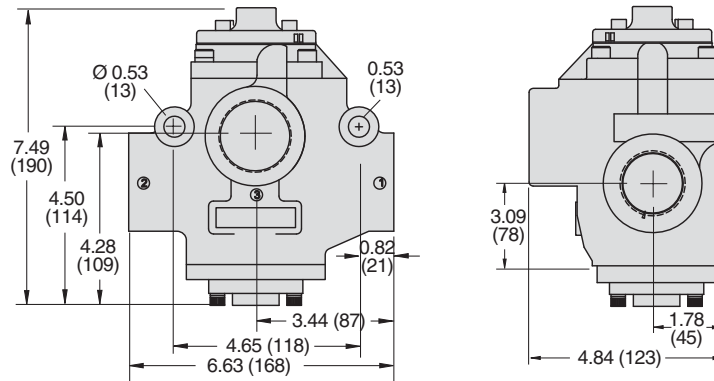
Body Size 3/8



Body Size 3/4



Body Size 1-1/4



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Ordering Information

4/2 Pressure Controlled Valves

MODEL NUMBER CONFIGURATOR

4-Way 2-Position Valves

Thread

G D

NPT Leave Blank

Series

21

5

6

B

2001

Actuation

Pressure Controlled

Valve Function

4/2

Revision Level

Size				
Body	Port 1	Port 2, 4	Port 3	
3/8	1/4	1/4	1/2	2001
	3/8	3/8	1/2	3001
	1/2	1/2	1/2	4011
3/4	1/2	1/2	1	4001
	3/4	3/4	1	5001
	1	1	1	6011
1-1/4	1	1	1-1/2	6001
	1-1/4	1-1/4	1-1/2	7001
	1-1/2	1-1/2	1-1/2	8011

Size				Flow Cv		Average Response Constants*			Weight lb (kg)	
Body	Port 1	Port 2, 4	Port 3	1-2, 1-4	4-3, 2-3	M	F			
							1-2, 1-4	4-3, 2-3		
3/8	1/4	1/4	1/2	2.1	2.9	30	1.70	2.28	3.0 (1.4)	
	3/8	3/8	1/2	2.9	4.2	30	1.13	1.33	3.0 (1.4)	
	1/2	1/2	1/2	3.1	4.3	30	1.00	1.22	3.0 (1.4)	
3/4	1/2	1/2	1	5.6	8.1	46	0.50	0.76	5.8 (2.6)	
	3/4	3/4	1	7.0	9.3	46	0.36	0.55	5.8 (2.6)	
	1	1	1	7.8	10	46	0.36	0.50	5.8 (2.6)	
1-1/4	1	1	1-1/2	19	26	99	0.19	0.22	12.0 (5.4)	
	1-1/4	1-1/4	1-1/2	21	27	99	0.19	0.18	12.0 (5.4)	
	1-1/2	1-1/2	1-1/2	22	27	99	0.16	0.15	12.0 (5.4)	

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 Schematic

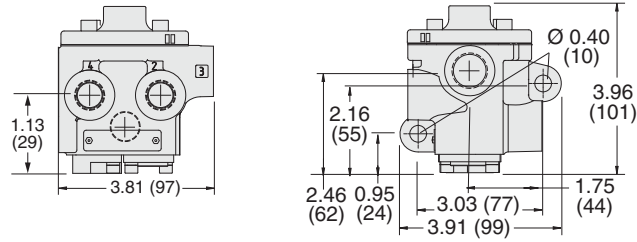
1/4" Signal Port

4/2 Pressure Controlled Valves

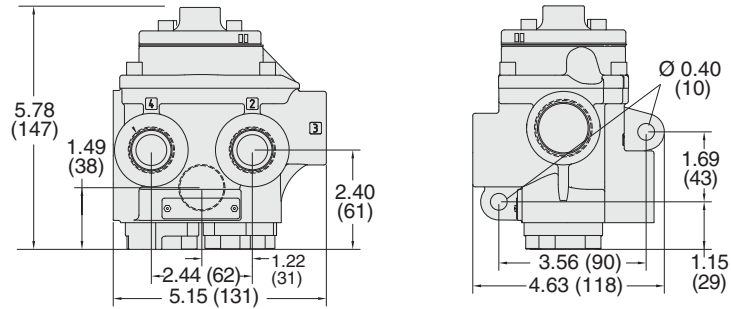
DIMENSIONS

Inches (mm)

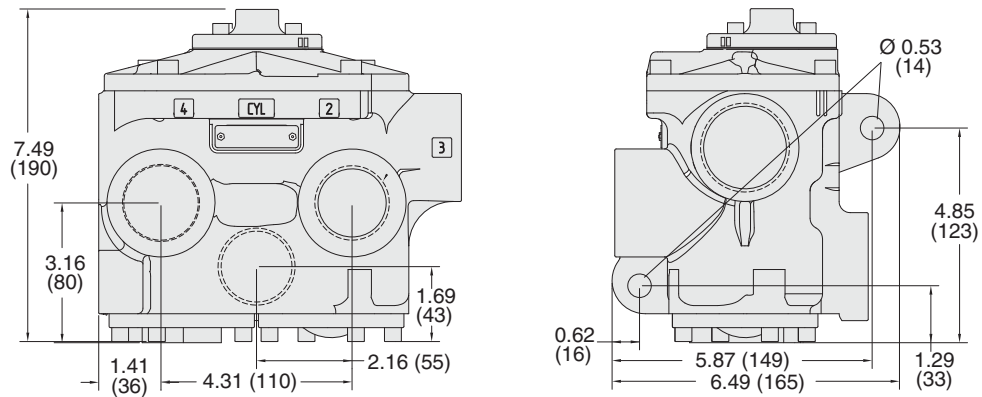
Body Size 3/8



Body Size 3/4



Body Size 1-1/4



For additional information, and to assist you with piping and connectivity designs, our products are available in downloadable 2D drawings and 3D CAD models in a wide range of options including native formats. Please visit www.rosscontrols.com.

Accessories & Options

SILENCERS

Silencers	Port Size	Thread Type	Model Number		Flow Avg. C _v	Pressure Range psig (bar)
			R/Rp Thread	NPT Thread		
	1/2	Male	D5500A4003	5500A4003	4.7	0-290 (0-20) maximum
	1	Male	D5500A6003	5500A6003	15	
	1-1/2	Female	D5500A8001	5500A8001	30	

SOLENOID PILOT OPTIONS

Indicator Light Kits	Kit Number					
	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.					
Manual Override Kits	Flush Button		Extended Button		Extended Button with Palm	
	Locking Type	Kit Number	Locking Type	Kit Number	Locking Type	Kit Number
	Non-Locking	790K87	Non-Locking	791K87	Non-Locking	984H87
	Locking	792K87				
	Flush metal 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.						

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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AMERICAS	USA	ROSS CONTROLS	Tel: +1-248-764-1800	www.rosscontrols.com
		AUTOMATIC VALVE	Tel: +1-248-474-6700	www.automaticvalve.com
		ROSS DECCO	Tel: +1-248-764-1800	www.rossdecco.com
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	Germany	ROSS EUROPA	Tel: +49 (0)6103-7597-100	www.rosseuropa.com
		manufactIS	Tel: +49 (0)2013-16843-0	www.manufactis.net
	United Kingdom	ROSS PNEUMATROL (FKA ROSS UK Ltd. and pneumatrol Ltd.)	Tel: +44 (0)1254 872277	www.rossuk.co.uk www.pneumatrol.com
ASIA & PACIFIC	China	ROSS CONTROLS (CHINA) Ltd.	Tel: +86-21-6915-7961	www.rosscontrolschina.com
	India	ROSS CONTROLS INDIA Pvt. Ltd.	Tel: +91-44-2624-9040	www.rosscontrols.com
	Japan	ROSS ASIA K.K.	Tel: +81-42-778-7251	www.rossasia.co.jp

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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.

For a current list of countries and local distributors, visit ROSS' at www.rosscontrols.com.