Clutch/Brake Control
Double Valves DM²® Series D

Product Catalog

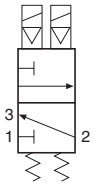
a global family

DM²® Series D Clutch/Brake Control Double Valves
Product Overview

Clutch/Brake Control Function

The DM²® Series D double valve is designed to provide SAFETY for the operators and maintenance personnel working on presses.

Simplified Schematic



The DM²® Series D double valve is a patented 3/2 normally closed valve (with an intermediate, lockout position) distinguished by SERPAR® Crossflow passages with poppet and spool valving on the main valve stems. This arrangement provides the valve's outstanding flow characteristics and an integrated monitoring capability with total memory. The valve provides dynamic monitoring and dynamic memory.

Dynamic Monitoring means that all monitoring components change state on every valve cycle. Should the valve elements cycle asynchronously, the valve will exhaust downstream air and lock-out, prohibiting further operation.

Dynamic Memory within a monitoring system indicates that when a valve lock-out occurs, the valve will retain the fault information regardless of air or electrical changes. The DM²® system can only be reset by a defined operation/procedure, and will not self-reset (turning the valve off and on) or reset when inlet air supply is removed and re-applied. Such automatic resetting would conceal potential hazards from the operator.

VALVE FEATURES

Redundant Control	Redundant control can achieve Category 4, PL e, when used with proper safety controls
Dynamic Monitoring with Complete Memory	Memory, monitoring, and air flow control functions are simply integrated into two identical valve elements. Valves lock-out due to asynchronous movement of valve elements during actuation or de-actuation, resulting in a residual outlet pressure of less than 1% of supply.
Valve Reset	Can only be accomplished by remote air signal, electrical solenoid reset signal, or manual pushbutton reset. The valve cannot be reset by removing and re-applying supply pressure.
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
Status Indicator	Includes a pressure switch with both normally open (NO) and normally closed (NC) contacts to provide status feedback to the control system indicating whether the valve is in the lockout or ready-to-run condition.
Silencer	High flow, clog resistant built-in silencer
Mounting	Base mounted for ease of valve replacement. Captive valve-to-base mounting screws.
Flexible Piping	Inlet and outlet ports on both sides (plugs for unused ports included)
Intermediate Pilots (Basic Size 12 & 30 valves only)	Increases pilot air flow for fast valve response, making it possible to use the same size solenoids as valve sizes 2, 4 & 8, thereby reducing electrical power requirements for these larger valves.
SISTEMA Library	Available for download at rosscontrols.com

PRODUCT CREDENTIALS

Safety Category	DGUV (German Social Accident Insurance)	CE Conformity Declaration	EAC Conformity Declaration	ISO Standard	CSA Certificate of Compliance	CRN Certification
Cat. 4 PL e / SIL 3 Functional Safety	DGUV Test HSM 06008 Sicherheit geprüft tested safety	CE	EAC	ISO 13849-1:2015	CSA C US	Available for appropriately tested valves

Specifications

STANDARD SPECIFICATIONS					
GENERAL	Function		Clutch/Brake Control		
	Construction Design		3/2 Normally Closed Valve, Dual Poppet		
	Actuation		Electrical		
	Mounting	Type	Base		
		Orientation	Vertically with pilot solenoids on top		
	Connection		Threaded; G, NPT		
	Monitoring		Dynamically, cyclically, internally during each actuating and de-actuating movement Monitoring function has memory and requires an overt act to reset unit after lockout		
	Minimum Operation Frequency		Once per month, to ensure proper function		
OPERATING CONDITIONS	Temperature	Ambient	15° to 122°F (-10° to 50°C)		
		Media	40° to 175°F (4° to 80°C)		
	Flow Media		Filtered, lubricated or unlubricated (mineral oils according to DIN 51519, viscosity classes 32-46)		
	Operating Pressure		Valve Basic Size	2	45 to 150 psig (3.1 to 10.3 bar)
				4, 8, 12, 30	30 to 120 psig (2.1 to 8.3 bar)
			Reset Pressure		For remote air reset option – must be equal to inlet pressure
			Manual Pressure		Encapsulated, push button actuation
ELECTRICAL DATA	Solenoids		According to VDE 0580. Enclosure rating according to DIN 400 50 IP 65 Three solenoids, rated for continuous duty		
	Operating Voltage		24 volts DC 110 volts AC, 50 Hz 120 volts AC, 50/60 Hz 230 volts AC, 50/60 Hz		
	Power Consumption (each solenoid)	Primary Solenoids	Valve Basic Size	2, 4, 12, 30	24 V DC, 110 V AC, 120 V AC, 230 V AC – 5.8 watts nominal, 6.5 watts maximum
				8	24 V DC – 15 watts 110 V AC, 120 V AC – 36 VA inrush and 24.6 VA holding 230 V AC – 32 VA inrush and 22 VA holding
		Reset Solenoids	All Valve Basic Size		24 V DC, 110 V AC, 120 V AC, 230 V AC – 5.8 watts nominal, 6.5 watts maximum
	Enclosure Rating		IP65, IEC 60529		
	Electrical Connection		DIN EN 175301-803 Form A, or M12		
	Mechanical Pressure Switch (Status Indicator) Rating		NO/NC Contacts - 0.1 A, 125/250 volts AC; 0.1 A, 30 volts DC; 0.3 A, 60 volts DC		
	Solid State Pressure Sensor (Status Indicator) Rating		Supply Voltage - 8-30 volts DC Current Consumption <4mA		
CONSTRUCTION MATERIAL	Valve Body		Cast Aluminum		
	Poppet		Acetal and Stainless Steel		
	Seals		Buna-N		
SAFETY DATA	Functional Safety Data		Category	CAT 4, PL e	
			B_{10D}	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 — 3-Way 2-Position Valves

DM2D | **N** | **B21** | **A** | **1** | **1** | **005**

Series

Thread

G	D
NPT	N

Basic Size	Port Size Inlet	Port Size Outlet	
2	1/4	1/4	B20
	3/8	3/8	B21
4	1/2	1/2	B42
	1/2	3/4	B43
8	3/4	3/4	A54
	1	1	A55
12	1	1	A66
	1	1-1/2	A67
30	1-1/2	2	A88

Reset Type

Remote Air	1
Solenoid	2
Manual	4

Voltage*

24 volts DC	A
110 volts AC, 50 Hz; 120 volts AC, 50/60 Hz	B
230 volts AC, 50/60 Hz	C**
12 volts DC	D
24 volts AC	E

* 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).

Status Indicator

Mechanical Pressure Switch, DIN EN 175301-803 Form A	1
Solid State Pressure Sensor, M12	2
None	X

Other Options*

Connector	Description		
DIN EN 175301-803 Form A	Solenoids	Connector not included	Leave Blank
	Solenoid Reset**		
	Mechanical Pressure Switch***	DIN EN Connector included	
M12 (24 V DC only)	Solid State Pressure Sensor***	M12 Built-in Connector included	
M12 (24 V DC only)	Solenoids	Adapter DIN EN to M12 Connector included	005
	Solenoid Reset**		
	Mechanical Pressure Switch***		
	Solid State Pressure Sensor***	M12 Built-in Connector included	

* See options for connectors or wiring kits.
** If solenoid reset type option is selected.
*** If the specific status indicator option is selected.

Valves and Sub-Bases can be ordered separately, see Replacement Valves and Sub-Bases page.

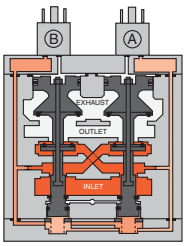
Valve Basic Size	Port Size 1	Port Size 2	Flow C_v 1-2	Flow C_v 2-3	Weight lb (kg)
2	1/4	1/4	2.17	3.66	5 (2.3)
	3/8	3/8			
4	1/2	1/2	2.80	6.70	6.0 (2.8)
	1/2	3/4			
8	3/4	3/4	4.63	12.55	9.1 (4.2)
	1	1			
12	1	1	8.86	20.78	15.5 (7.1)
	1	1-1/2			
30	1-1/2	2	20.22	53.68	32.6 (14.8)

Valve and base assembly with status indicator and solenoid reset.

Valve Operation

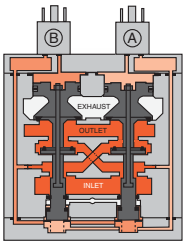
Valve De-actuated (ready-to-run)

The flow of inlet air pressure into the crossover passages is restricted by the size of the passage between the stem and the valve body opening. Flow is sufficient to quickly pressurize pilot supply/timing chambers A and B. The inlet poppets prevent air flow from crossover passages into the outlet chamber. Air pressure acting on the inlet poppets and return pistons securely hold the valve elements in the closed position. (Air passages shown out of position and reset adapter omitted for clarity.



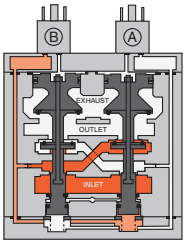
Valve Actuated

Energizing the pilot valves simultaneously applies pressure to both pistons, forcing the internal parts to move to their actuated (open) position, where inlet air flow to crossover passages is fully open, inlet poppets are fully open and exhaust poppets are fully closed. The outlet is then quickly pressurized, and pressure in the inlet, crossovers, outlet, and timing chambers are quickly equalized. De-energizing the pilots quickly causes the valve elements to return to the ready-to-run position.



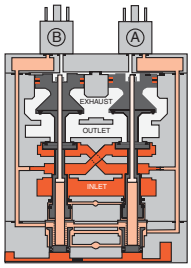
Valve Locked-out

Whenever the valve elements operate in a sufficiently asynchronous manner, either on actuation or de-actuation, the valve will move to a locked-out position. In the locked-out position, one crossover and its related timing chamber will be exhausted, and the other crossover and its related timing chamber will be fully pressurized. The valve element (side B) that is partially actuated has pilot air available to fully actuate it, but no air pressure on the return piston to fully de-actuate the valve element. Air pressure in the crossover acts on the differential of side B stem diameters creating a latching force.
Side A is in a fully closed position, and has no pilot air available to actuate, but has full pressure on the inlet poppet and return piston to hold the element in the fully closed position.
Inlet air flow on side A into its crossover is restricted, and flows through the open inlet poppet on side B, through the outlet into the exhaust port, and from the exhaust port to atmosphere. Residual pressure in the outlet is less than 1% of inlet pressure.
The return springs are limited in travel, and can only return the valve elements to the intermediate (locked-out) position. Sufficient air pressure acting on the return pistons is needed to return the valve elements to a fully closed position.



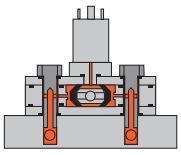
Resetting the Valve

The valve will remain in the locked-out position, even if the inlet air supply is removed and re-applied. A remote reset signal (air or electric), or a manual push button actuation must be applied to reset the valve.
Reset is accomplished by momentarily pressurizing the reset port. Actuation of the reset piston physically pushes the main valve elements to their closed position. Inlet air fully pressurizes the crossovers and holds the inlet poppets on seat. Actuation of the reset piston opens the reset poppet, thereby, immediately exhausting pilot supply air, thus, preventing valve operation during reset. (Reset adapter added to illustration.)
De-actuation of reset pistons causes the reset poppets to close and pilot supply to fully pressurize.
Reset air pressure can be applied by a remote 3/2 normally closed valve, or from an optional 3/2 normally closed solenoid, or a manual push button mounted on the reset adapter.



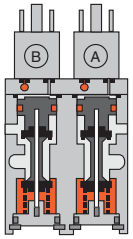
Status Indicator

The status indicator pressure switch will actuate when the main valve is operating normally, and will de-actuate when the main valve is in the locked-out position or inlet pressure is removed. This device is not part of the valve lockout function, but, rather, only reports the status of the main valve.



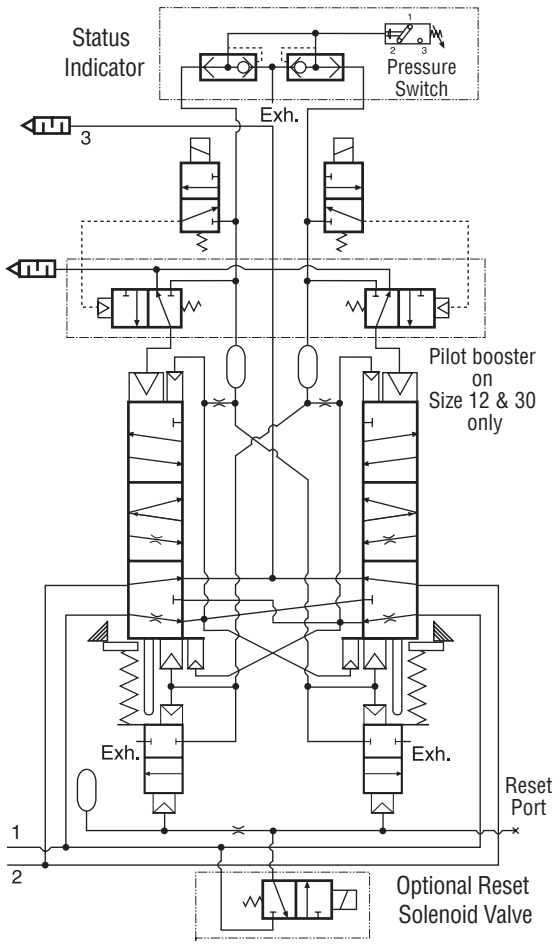
Status Indicator
in normal ready-to-run position

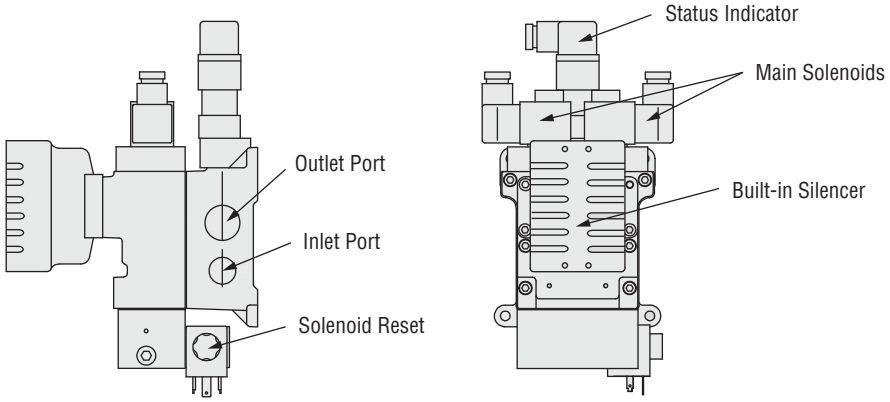
Basic Size 12 and 30 valves require relatively large pilots to actuate and de-actuate the main valve elements. In order to achieve extremely quick valve response for such large pilots, a 2-stage solenoid pilot system is incorporated into the design.
This keeps the required electrical current to operate the pilots to a minimum.



Valve
Basic Size 12 & 30 Pilots

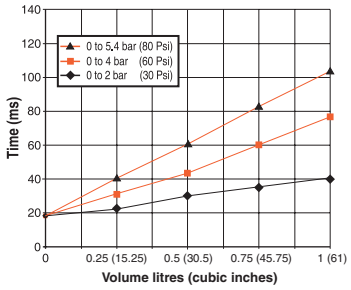
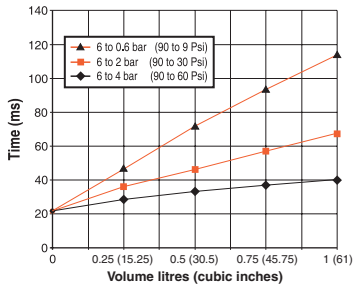
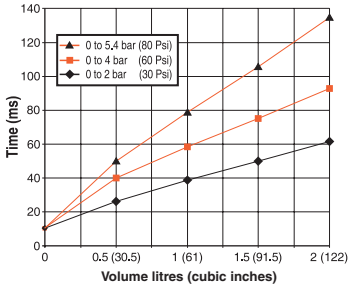
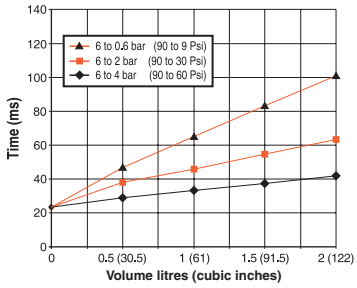
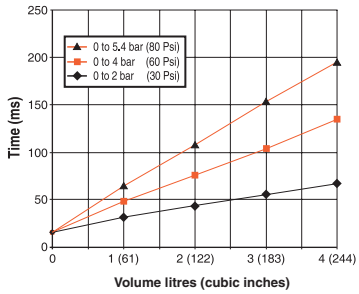
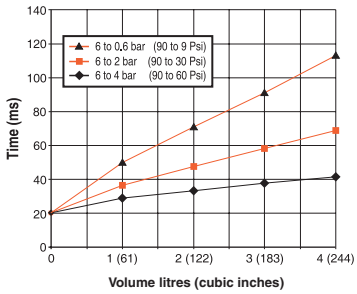
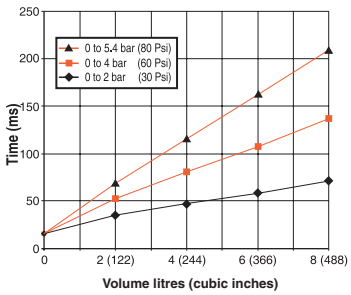
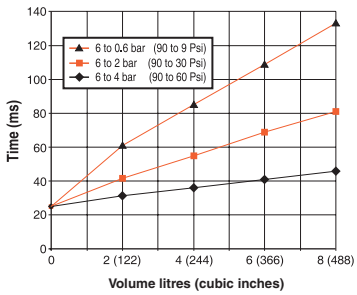
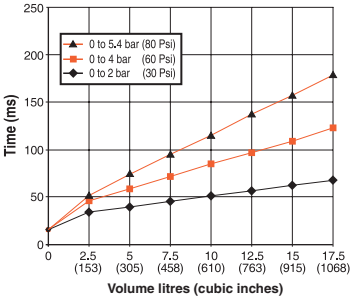
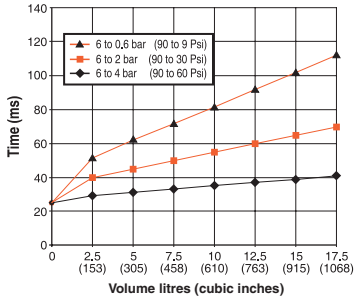
Valve Schematic



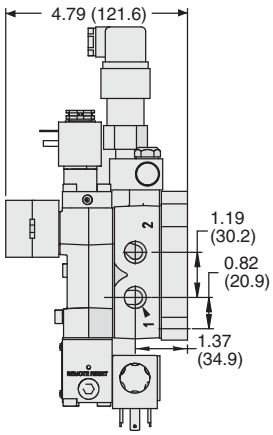
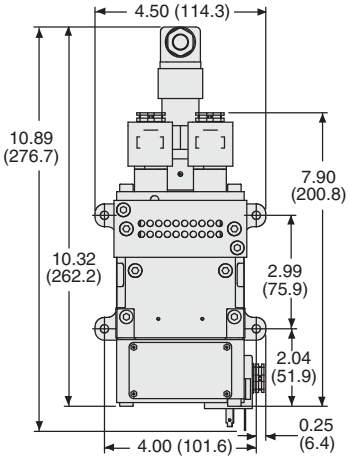
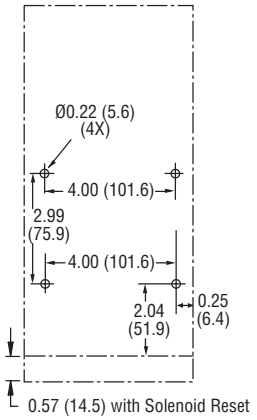
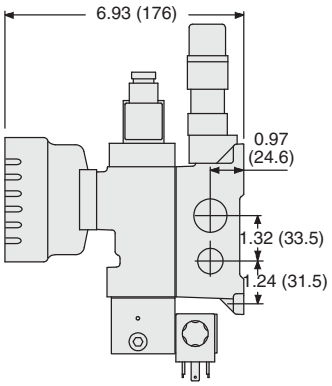
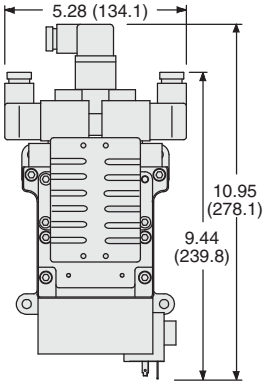
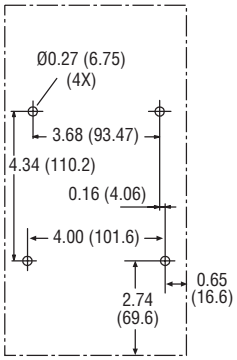
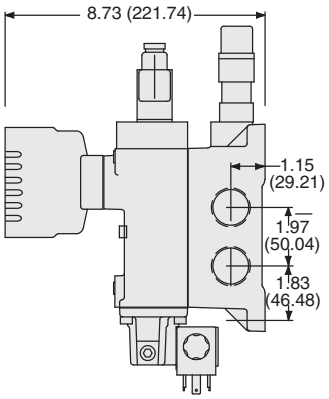
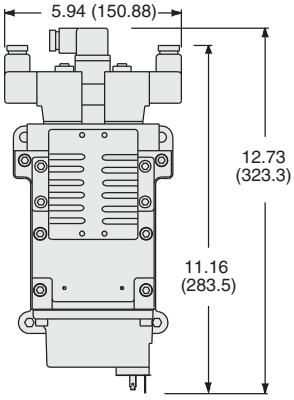
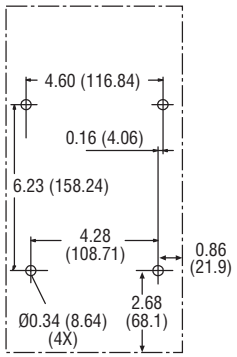


VALVE RESPONSE CHARTS

The charts below represent the fill and exhaust times for each of the various sizes of DM[2®] Series D double valves. The "fill" times were measured while raising (filling) the pressure in a volume from 0 to 30, 60, & 80 psi (0 to 2.1, 4.1, & 5.5 bar) with a 90 psi (6.2 bar) inlet pressure. Conversely, the "exhaust" times were measured while lowering the pressure (exhausting) in a volume from 90 psi (6.2 bar) down to 90 to 60, 30, & 9 psi (4.1, 2.1, & 0.6 bar). Exhausting tests performed with silencer installed.

	Filling	Exhausting
Basic Size 2		
Basic Size 4		
Basic Size 8		
Basic Size 12		
Basic Size 30		

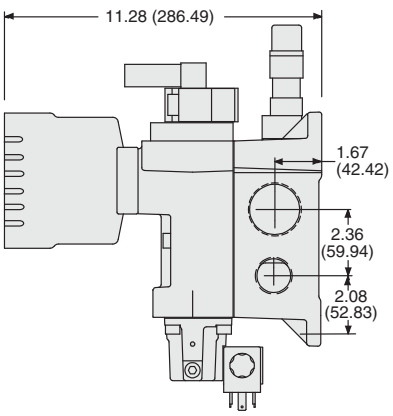
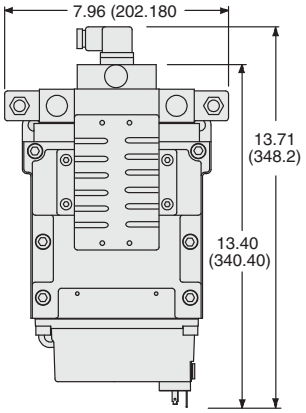
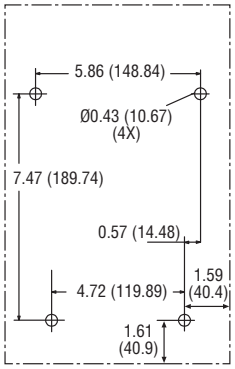
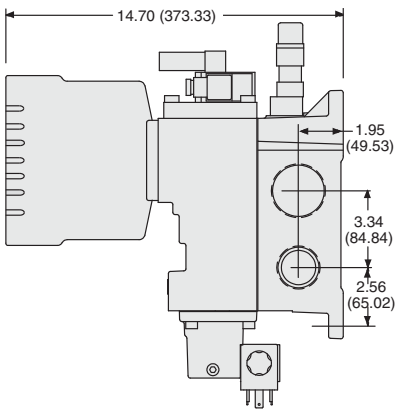
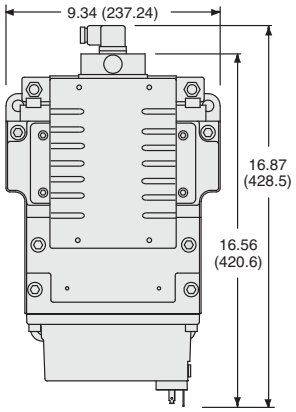
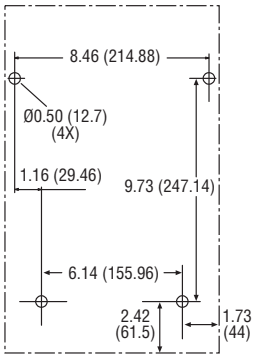
DIMENSIONS — Inches (mm)

Basic Size	Port Size			View X (base mounting hole pattern)
2	1/4 3/8			
4	1/2			
8	3/4 1			

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, visit www.rosscontrols.com.

DIMENSIONS

Inches (mm)

Basic Size	Port Size			View X (base mounting hole pattern)
12	1			
30	2			

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ELECTRICAL STATUS INDICATION

Pressure Switches for Status Indicator

Indicator Type	Connector Type	Model Number	Port Thread	Factory Preset psi (bar)
Mechanical Pressure Switch	DIN EN 175301-803 Form A	1104A30	M10x1	22 (1.5) falling
	M12	1153A30		
Solid State Pressure Sensor	M12	1335B30W	M10x1	17 (1.2) falling

Status Indicator Assemblies

Indicator Type	Connector Type	Model Number	Factory Preset psi (bar)
Mechanical Pressure Switch	DIN EN 175301-803 Form A	670B94	22 (1.5) falling
Solid State Pressure Sensor	M12	766B94#	17 (1.2) falling

Not compatible with Basic Size 4 valves manufactured before 3/2021, e.g., DM2DDA4***or DM2DNA4***. For Basic Size 4 valves manufactured before 3/2021, use part number 670B94.

ENERGY RELEASE VERIFICATION

Pressure Switches

Verification Type	Installation Location	Connector Type	Model Number	Factory Preset psi (bar)	Port Thread
Electrical	Downstream	DIN EN 175301-803 Form A	586A86	5 (0.3) falling	1/8 NPT

Redundant Pressure Switch Assembly

Verification Type	Installation Location	Connector Type	Model Number	Factory Preset psi (bar)	Port Size
Electrical (Dual)	Downstream	DIN EN 175301-803 Form A	RC026-13	5 (0.3) falling	3/8 NPT

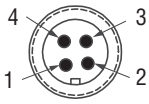
Connectors Pinout

Mechanical Pressure Switch

DIN EN 175301-803 Form A

1 - Common
2 - Normally Closed
3 - Normally Open
G - Ground

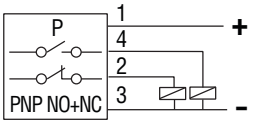
M12



1 - Common
2 - Normally Closed
3 - Not Used
4 - Normally Open

Solid State Pressure Sensor

M12



1, 2, 3, 4 - Pin
PNP - Switched Positive
NO - Normally Open
NC - Normally Closed

ELECTRICAL CONNECTORS

Pre-wired Connector Kits

Connection Type	Connector Type	Cable End 1	Cable End 2	Length meters (feet)	Quantity	Kit Number Without Light	Kit Number Lighted Connector 24 V DC	Kit Number Lighted Connector 120 V AC	Kit Number Lighted Connector 230 V AC
Solenoid and Status Indicator	DIN EN 175301-803 Form A	Connector	Flying leads	5 (16.4)	4	2283H77	2532H77-W	2532H77-Z	2532H77-Y
				10 (32.8)	4	2284H77	2533H77-W	2533H77-Z	2533H77-Y
	M12 5-pin, Female	Connector	Flying leads	5 (16.4)	4	2288H77	–	–	–
				10 (32.8)	4	2289H77	–	–	–

Pre-wired Connectors

Connection Type	Connector Type	Cable End 1	Cable End 2	Length meters (feet)	Quantity	Cable Diameter	Model Number Without Light	Model Number Lighted Connector 24 V DC	Model Number Lighted Connector 120 V AC	Model Number Lighted Connector 230 V AC
Solenoid	DIN EN 175301-803 Form A	Connector	Flying leads	2 (6.5)	1	6-mm	721K77	720K77-W	720K77-Z	720K77-Y
					1	10-mm	371K77	383K77-W	383K77-Z	383K77-Y
Status Indicator	M12 5-pin, Female	Connector	Flying leads	5 (16.4)	1	6-mm	2666H77	–	–	–
				10 (32.8)	1	6-mm	2667H77	–	–	–

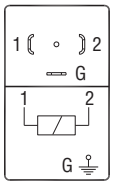
Connectors (no cable)

Connection Type	Connector Type	Fitting Connection	Quantity	Model Number Without Light	Model Number Lighted Connector 24 V DC	Model Number Lighted Connector 120 V AC	Model Number Lighted Connector 230 V AC
Solenoid	DIN EN 175301-803 Form A	Cable grip	1	937K87	936K87-W	936K87-Z	936K87-Y
		1/2" NPT conduit	1	723K77	724K77-W	724K77-Z	724K77-Y

Connectors Pinout

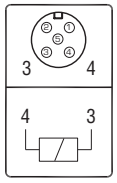
Solenoid

DIN EN 175301-803 Form A



1 - Black
2 - Black
G - Green/Yellow (Ground)

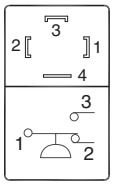
M12



3 - Blue
4 - Black

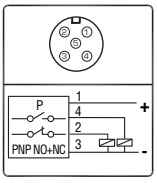
Status Indicator

DIN EN 175301-803 Form A



1 - Brown
2 - Grey
3 - Black
4 - Green/Yellow (Ground)

M12



1, 2, 3, 4 - Pin
PNP - Switched Positive
NO - Normally Open
NC - Normally Closed

JUNCTION BOX OPTIONS

Wiring Kits with J-Box

J-Box			Cable Connector Type		Length meters (feet)	Cable Quantity	Kit Number
Connection Type		J-Box Quantity					
Control System	Solenoids / Status Indicator		End 1	End 2			
10-pin Mini	M12 (5-pin)	1	M12	DIN EN 175301-803 Form A	1.0 (3.3)	4	2249H77
		1	M12	M12	1.0 (3.3)	4	2250H77

10-Pin MINI Cables

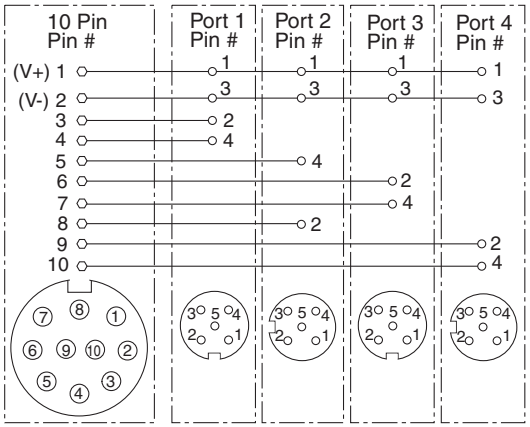
Connection Type	Cable Connector Type			Length meters (feet)	Cable Quantity	Kit Number
	End 1	End 2	Cable Conductors			
J-Box to Control System	10-pin Mini	Flying leads	18-gauge wire	3.7 (12)	1	2253H77
				6.1 (20)	1	2254H77
				9.1 (30)	1	2255H77
				15.2 (50)	1	2256H77

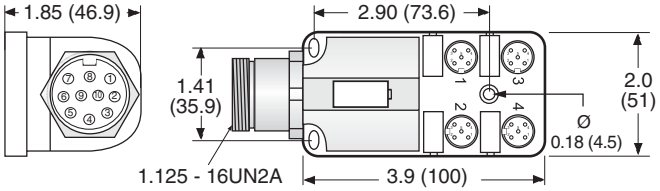
Outlet Port Pressure Monitoring Wiring Kit

Port Splitter			Cable Connector Type		Length meters (feet)	Cable Quantity	Kit Number
Port Connectors	Number of Ports	Splitter Quantity	End 1	End 2			
M12	3	1	M12	DIN EN 175301-803 Form A	1.0 (3.3)	1	2251H77

Connectors Pinout and Wiring Diagram

J-Box Wiring

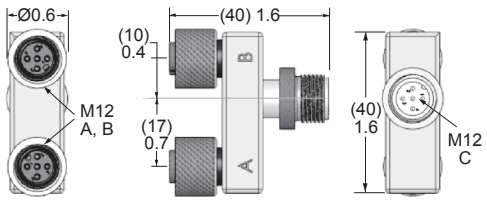


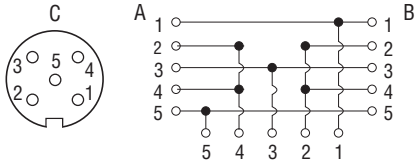


10-Pin MINI Cable

PIN #	Wire Colors	PIN #	Wire Colors
1 +24 V DC	Orange	6 -	Orange w/Black
2 Common V DC	Blue	7 Remote Reset	Red
3 -	White w/Black	8 -	Green/Yellow
4 Solenoid A	Red w/Black	9 Remote Valve Fault Light	Black
5 Solenoid B	Green w/Black	10 Remote System OK Light	White

Outlet Port Pressure Monitoring – Port Splitter





A & B Female
C Male

NOISE REDUCTION SILENCERS

High Flow Noise Reduction Silencer Kits

Valve Basic Size	Kit Number#*	
	R/Rp Thread	NPT Thread
4	2329H77	2324H77
8	2329H77	2325H77
12	2330H77	2326H77
30	2331H77	2327H77

 # Exhaust Flange Kit required, see below ordering information.

* Kits include all plumbing required for installation.

** Dimensions reflect valve with installed silencer.

Reduces the Exponentially Perceived Noise (EPNdB), Impact noise reduction in the 35–40 dB range.
Recommended for air exhaust applications for pressures up to 125 psig (8.6 bar).
Pressure Range – 125 psig (8.6 bar) maximum.

Valve Basic Size	Flow scfm (L/s)	Dimensions** inches (mm)				Pressure Range psig (bar)
		Width	Height (R-RP)	Height (NPT)	Depth	
4	800 (378)	4.34 (110.2)	21.40 (543.6)	19.06 (484.1)	7.27 (184.7)	0-125 (0-8.6) maximum
8	800 (378)	5.41 (137.4)	23.52 (597.4)	21.18 (538.0)	8.41 (213.6)	
12	2080 (982)	6.74 (117.2)	28.20 (716.3)	25.85 (656.6)	10.66 (270.8)	
30	7200 (3398)	9.85 (250.2)	41.55 (1055.4)	41.55 (1055.4)	13.47 (342.1)	

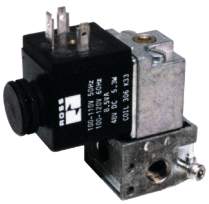
Exhaust Flange Kits For Noise Reduction Silencers

Valve Basic Size	Valve Port Size	Kit Number	
		G Thread	NPT Thread
4	1	D276B25	726B25
8	1	D617B25	617B25
12	1-1/2	D619B25	619B25
30	2-1/2	D621B25	621B25

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**	
		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
			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	

REPLACEMENT VALVES (VALVE ONLY NO BASE)

MODEL NUMBER CONFIGURATOR

3-Way 2-Position Valves

DM2D	X	B2X	A	1	X	005
Series	Thread		Voltage*	Reset Type	Status Indicator	Other Options*

Thread

None

Reset Type

Remote Air	1
Solenoid	2
Manual	4

Status Indicator

None

Other Options*

Connector	Description		
DIN EN 175301-803 Form A*	Solenoids	Connector not included	Leave Blank
	Solenoid Reset**		
M12 (24 V DC only)	Solenoids	Adapter DIN EN to M12 Connector included	005
	Solenoid Reset**		

*See options for connectors or wiring kits.
** If solenoid reset type option is selected.

Basic Size	Port Size		
	Inlet	Outlet	
2	1/4	1/4	B2X
	3/8	3/8	
4	1/2	1/2	B4X
	1/2	3/4	
8	3/4	3/4	A5X
	1	1	
12	1	1	A6X
	1	1-1/2	
30	1-1/2	2	A8X

Voltage*

24 volts DC	A
110 volts AC, 50 Hz; 120 volts AC, 50/60 Hz	B
230 volts AC, 50/60 Hz	C**
12 volts DC	D
24 volts AC	E

* 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).

REPLACEMENT SUB-BASES

Valve Basic Size	Port Size		Status Indicator	Sub-Base Model Number		Weight lb (kg)
	Inlet	Outlet		G Thread	NPT Thread	
2	1/4	1/4	No	D1872C91	1872C91	1.7 (0.8)
			Yes	D1873C91	1873C91	2.1 (1.0)
	3/8	3/8	No	D1874C91	1874C91	1.7 (0.8)
			Yes	D1875C91	1875C91	2.1 (1.0)
4	1/2	1/2	No	D1697C91	1697C91	1.7 (0.8)
			Yes	D1698C91	1698C91	2.3 (1.1)
	1/2	3/4	No	D1699C91	1699C91	1.7 (0.8)
			Yes	D1700C91	1700C91	2.3 (1.1)
8	3/4	3/4	No	D1701C91	1701C91	3.6 (1.6)
			Yes	D1702C91	1702C91	4.2 (1.9)
	1	1	No	D1703C91	1703C91	3.6 (1.6)
			Yes	D1704C91	1704C91	4.2 (1.9)
12	1	1	No	D1705C91	1705C91	6.2 (2.8)
			Yes	D1706C91	1706C91	6.8 (3.1)
	1	1-1/2	No	D1707C91	1707C91	6.2 (2.8)
			Yes	D1708C91	1708C91	6.8 (3.1)
30	1-1/2	2	No	D1709C91	1709C91	12.0 (5.4)
			Yes	D1710C91	1710C91	12.6 (5.7)

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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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.

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