



**SAFE EXHAUST DOUBLE VALVES**  
**DM<sup>2</sup>® SERIES C**

**PRODUCT CATALOG**



# Safe Exhaust Control Reliable Double Valves DM<sup>2</sup>® Series C

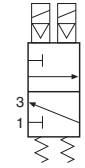
## Product Overview



### Safe Exhaust Safety Function

The DM<sup>2</sup> Series C valve safety function is to shut off supply or pneumatic energy and to exhaust any pneumatic energy from downstream of the valve.

### Simplified Schematic



The DM<sup>2</sup> Series C Safe Exhaust valves are dual valves used to block the supply and remove the downstream pressure from the circuit or machine. It is integrated into the electrical safety system to remove potentially hazardous energy in order to provide employees safe access to a machine or zone. By quickly removing the pneumatic energy with a safety valve, determined by the risk assessment, the safety system integrity is maintained allowing the employee to complete their tasks and safely and rapidly.

## VALVE FEATURES

<b>Redundant Control</b>	Redundant control can achieve Category 4, PL e, when used with proper safety controls
<b>Dynamic Monitoring</b>	Monitoring, and air flow control functions are simply integrated into two identical valve elements
<b>Dynamic Memory</b>	Asynchronous movement of valve elements is detected by the dynamic monitoring and the valve latches in the safe condition, resulting in a residual outlet pressure of less than 1% of supply
<b>Valve Reset</b>	Can only be accomplished by the integrated electrical (solenoid) reset; the valve cannot be reset by removing and re-applying supply pressure
<b>Poppet Design</b>	Dirt tolerant, wear compensating for quick response and high flow capacity
<b>PTFE Backup Piston Rings</b>	Enhances valve endurance enabling operation with or without in-line lubrication
<b>Status Indicator</b>	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
<b>Silencer</b>	High flow, clog resistant silencer included
<b>Mounting</b>	Base mounted for ease of valve replacement, captive valve-to-base mounting screws
<b>Flexible Piping</b>	Inlet and outlet ports on both sides (plugs for unused ports included)
<b>Intermediate Pilots (Basic Size 12 and 30 valves only)</b>	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
<b>SISTEMA Library</b>	Available for download at <a href="http://rosscontrols.com">rosscontrols.com</a>

*These valves are not designed for controlling clutch/brake mechanisms on mechanical power presses, see DM<sup>2</sup> Series D double valves for mechanical power press applications.*

## STANDARD SPECIFICATIONS

<b>GENERAL</b>	Function		3/2 Normally Closed Valve		
	Construction Design		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			
<b>OPERATING CONDITIONS</b>	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)		
<b>ELECTRICAL DATA ELECTRICAL DATA</b>	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, 110/120 V AC, 230 V AC – 5.8 watts nominal, 6.5 watts maximum
				8	24 V DC – 15 watts 110/120 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, 110/120 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			
<b>CONSTRUCTION MATERIAL</b>	Valve Body		Cast Aluminum		
	Poppet		Acetal and Stainless Steel		
	Seals		Buna-N		
<b>SAFETY DATA</b>	Functional Safety Data	Category	CAT 4, PL e		
		B <sub>100</sub>	20,000,000		
		PFH <sub>D</sub>	7.71x10 <sup>-9</sup>		
		MTTF <sub>D</sub>	301.9 (n <sub>op</sub> : 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.

## PRODUCT CREDENTIALS

Safety Category	DGUV (German Social Accident Insurance)	CE Conformity Declaration	EAC Conformity Declaration	ISO Standard	CSA Certificate of Compliance	CRN Certification
				ISO 13849-1:2015		Available for appropriately tested valves

# Ordering Information

## MODEL NUMBER CONFIGURATOR

## 3-Way 2-Position Valves

<b>DM2C</b>	<b>D</b>	<b>B21</b>	<b>A</b>	<b>2</b>	<b>1</b>																																																					
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Basic Size	Port Size			Flow Cv		Weight# lb (Kg)
	1	2	3	1-2	2-3	
2	1/4	1/4	3/4	1.7	2.6	5.3 (2.4)
	3/8	3/8	3/4	2.2	3.6	
4	1/2	1/2	1	3.0	6.5	5.9 (2.6)
8	3/4	3/4	1	4.2	9.4	8.4 (3.7)
	1	1	1	4.3	9.4	
12	1	1	1-1/2	8.7	17	15.3 (3.7)
30	1-1/2	2	2-1/2	20	55	34.7 (15.1)

# Valve and base assembly with status indicator.

## Safety Solutions Options

### Safe Air Entry System Assemblies with DM2® Series C Double Valves

Air Entry System Assemblies with manual Lockout L-O-X® valve, air preparation FRL combinations, and Safe Exhaust Double Valves are available.

For information please visit [www.rosscontrols.com](http://www.rosscontrols.com).



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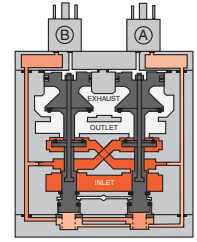
Tel. 0 2384 6060, Fax 0 2384 5701, Email : [sales@flutech.co.th](mailto:sales@flutech.co.th), [www.flutech.co.th](http://www.flutech.co.th)

# Valve Operation



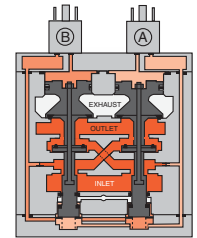
## Valve De-actuated (ready-to-run)

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

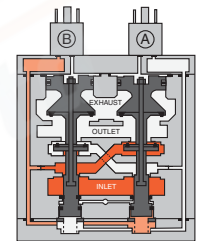
Energizing the pilot valves simultaneously applies pressure to both pistons, forcing the internal parts to move to their actuated (open) position, where inlet air flow to crossover passages is fully open, inlet poppets are fully open and exhaust poppets are fully closed. The outlet is then quickly pressurized, 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.

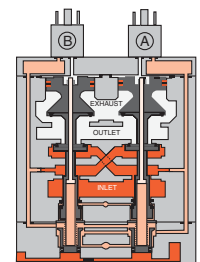
The valve element (side B) that is partially actuated has pilot air available to fully actuate it, but no air pressure on the return piston to fully de-actuate the valve element. Air pressure in the crossover acts on the differential of side B stem diameters creating a latching force. Side A is in a 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

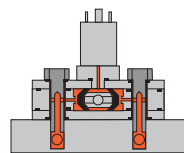
The valve will remain in the locked-out position, even if the inlet air supply is removed and re-applied.

A remote reset signal 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 pressure can be applied by a remote 3/2 normally closed valve, or from an optional 3/2 normally closed solenoid mounted on the reset adapter. 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.



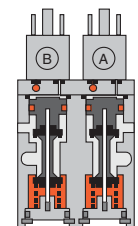
## Status Indicator

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.



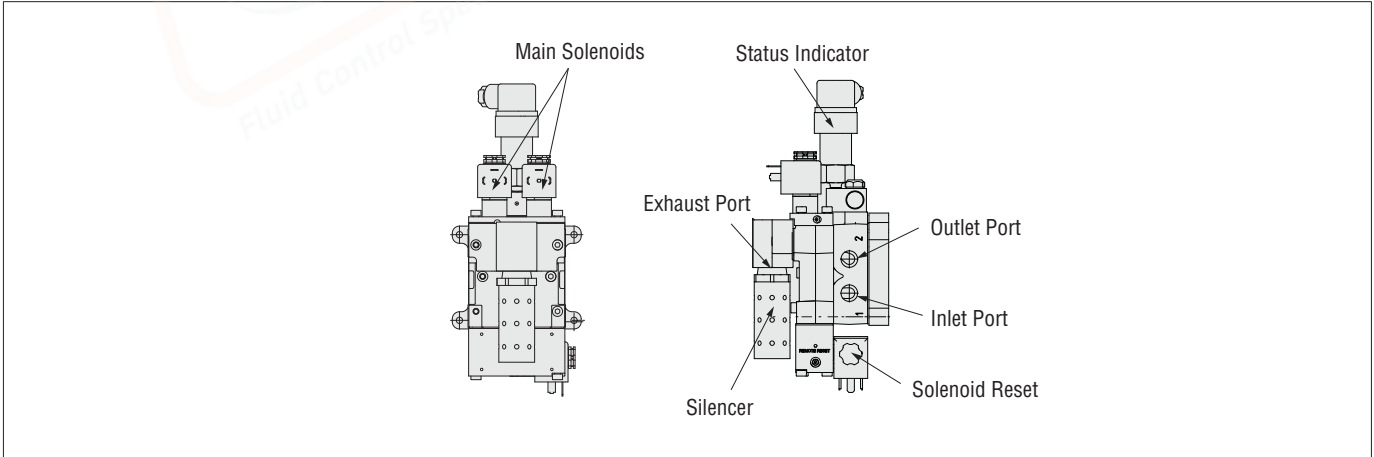
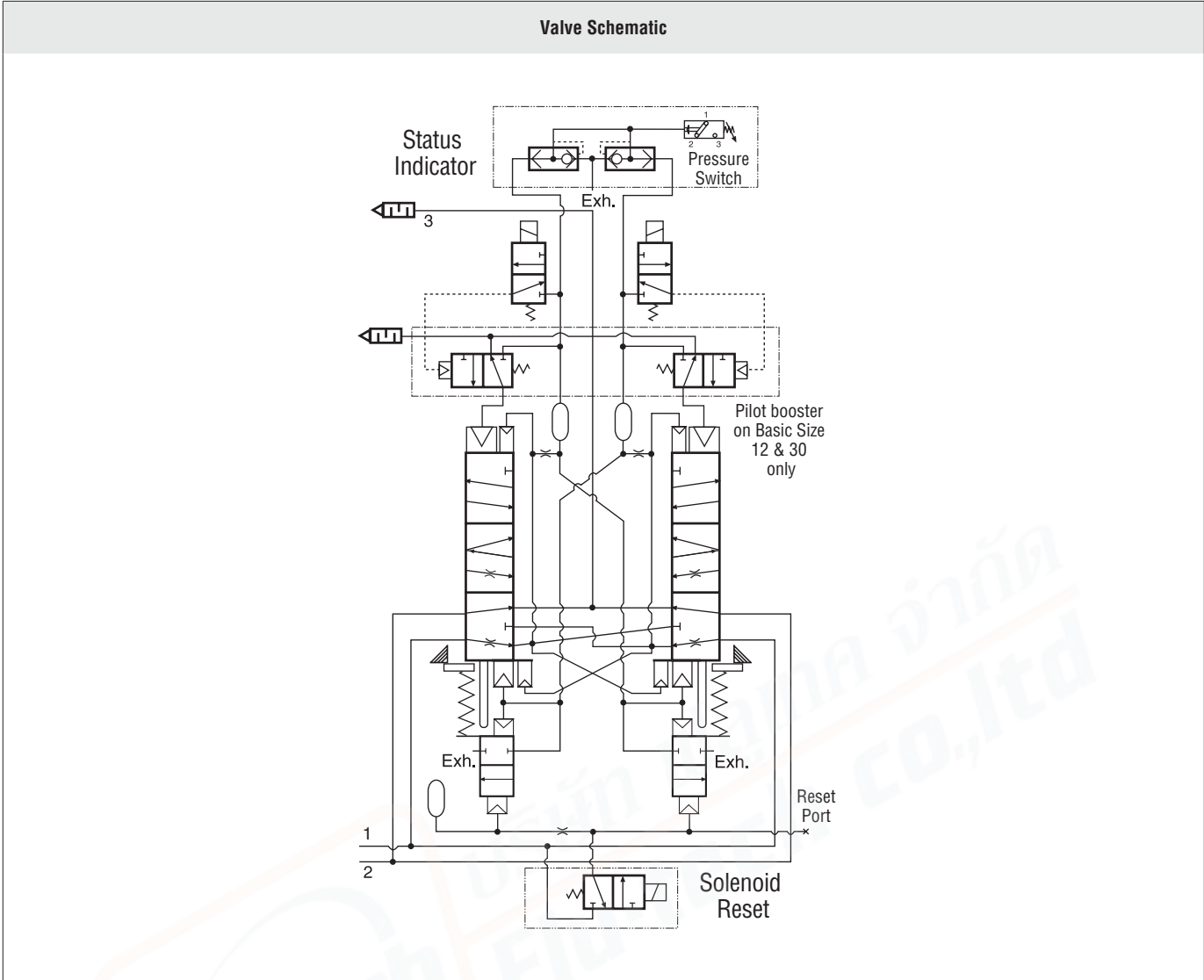
Status Indicator in normal ready-to-run position

**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 Technical Data



# Valve Technical Data



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](http://www.rosscontrols.com).



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Tel. 0 2384 6060, Fax 0 2384 5701, Email : [sales@flutech.co.th](mailto:sales@flutech.co.th), [www.flutech.co.th](http://www.flutech.co.th)

# Valve Technical Data

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

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](http://www.rosscontrols.com).



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Tel. 0 2384 6060, Fax 0 2384 5701, Email : [sales@flutech.co.th](mailto:sales@flutech.co.th), [www.flutech.co.th](http://www.flutech.co.th)



## PRESSURE 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	Y670B94	22 (1.5) falling
	Solid State Pressure Sensor	M12	Y766B94#	17 (1.2) falling

# Not compatible with Size 4 valves manufactured before 3/2021, e.g., DM2CDA4\*\*\* or DM2CNA4\*\*\*. For Size 4 valves manufactured before 3/2021, use part number Y670B94.

## 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		Solid State Pressure Sensor	
DIN EN 175301-803 Form A	M12	M12	
<p>1 - Common 2 - Normally Closed 3 - Normally Open G - Ground</p>	<p>1 - Common 2 - Normally Closed 3 - Not Used 4 - Normally Open</p>	<p>1, 2, 3, 4 - Pin PNP - Switched Positive NO - Normally Open NC - Normally Closed</p>	

# Accessories & Options

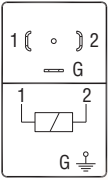
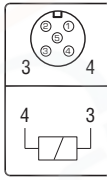
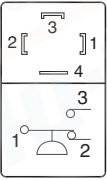
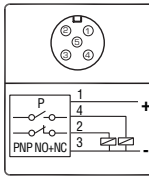
## ELECTRICAL CONNECTORS

Pre-wired Connector Kits	Connection Type	Connector Type	Cable		Quantity	Length meters (feet)	Cable Diameter mm	Kit Number			
			End 1	End 2				Without Light	Lighted Connector		
									24 V DC	120 V AC	230 V AC
Solenoid and Status Indicator	DIN EN 175301-803 Form A	Connector	Flying leads	4	5 (16.4)	6	2283H77	2532H77-W	2532H77-Z	2532H77-Y	
				4	10 (32.8)	6	2284H77	2533H77-W	2533H77-Z	2533H77-Y	
	M12 5-pin, Female	Connector	Flying leads	4	5 (16.4)	6	2288H77	-	-	-	
				4	10 (32.8)	6	2289H77	-	-	-	

Pre-wired Connectors	Connection Type	Connector Type	Cable		Quantity	Length meters (feet)	Cable Diameter mm	Model Number			
			End 1	End 2				Without Light	Lighted Connector		
									24 V DC	120 V AC	230 V AC
Solenoid	DIN EN 175301-803 Form A	Connector	Flying leads	1	2 (6.5)	6	721K77	720K77-W	720K77-Z	720K77-Y	
				1		10	371K77	383K77-W	383K77-Z	383K77-Y	
Status Indicator	M12 5-pin, Female	Connector	Flying leads	1	5 (16.4)	6	2241H77	-	-	-	
				1	10 (32.8)	6	2242H77	-	-	-	

Connectors (no cable)	Connection Type	Connector Type	Fitting Connection	Quantity	Cable Diameter mm	Model Number			
						Without Light	Lighted Connector		
							24 V DC	120 V AC	230 V AC
Solenoid	DIN EN 175301-803 Form A		Cable grip	1	8 to 10	937K87	936K87-W	936K87-Z	936K87-Y
			1/2" NPT conduit	1	-	723K77	724K77-W	724K77-Z	724K77-Y

### Connectors Pinout

Solenoid		Status Indicator	
DIN EN 175301-803 Form A	M12	DIN EN 175301-803 Form A	M12
 <p>1 - Black 2 - Black G - Green/Yellow (Ground)</p>	 <p>3 - Blue 4 - Black</p>	 <p>1 - Brown 2 - Grey 3 - Black 4 - Green/Yellow (Ground)</p>	 <p>1, 2, 3, 4 - Pin PNP - Switched Positive NO - Normally Open NC - Normally Closed</p>



**บริษัท ฟลูเทค จำกัด**  
**FLU-TECH CO.,LTD**

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## JUNCTION BOX OPTIONS

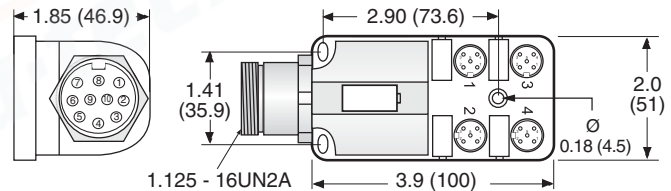
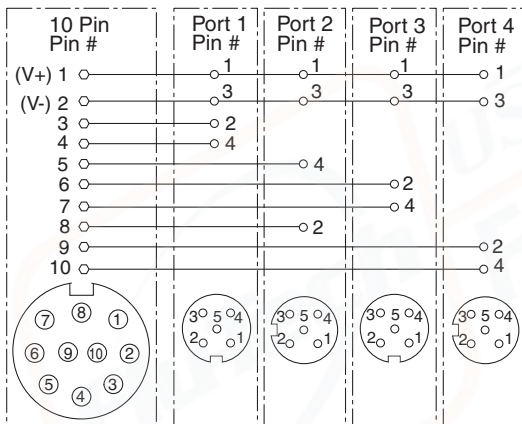
Wiring Kits with J-Box	J-Box			Cable Connector Type		Length meters (feet)	Cable Quantity	Kit Number
	Connection Type		J-Box Quantity	End 1	End 2			
	Control System	Solenoids / Status Indicator						
	10-pin Mini	M12 (5-pin)	1	M12	DIN EN 175301-803 Form A	1.0 (3.3)	4	2249H77
			1	M12	M12	1.0 (3.3)	4	2250H77

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

### Connectors Pinout and Wiring Diagram

#### J-Box Wiring

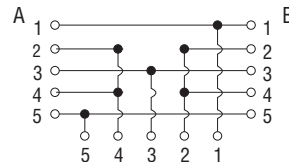
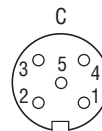
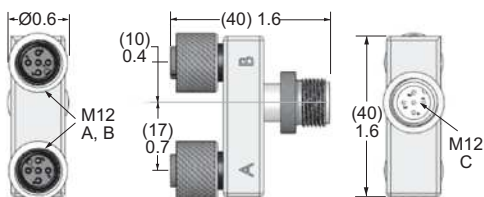


#### 10-Pin MINI Cable

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**

# Options

## NOISE REDUCTION SILENCERS

High Flow Noise Reduction Silencer Kits	Valve Basic Size	Kit Number*	
		R/Rp Thread	NPT Thread
	2	2328H77	2323H77
	4	2329H77	2324H77
	8	2329H77	2325H77
	12	2330H77	2326H77
30	2331H77	2327H77	



\* Kits include all plumbing required for installation.

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	
2	800 (378)	4.96 (126.1)	16.05 (407.7)	14.24 (361.7)	5.73 (145.5)	0-125 (0-8.6) maximum
4	800 (378)	4.34 (110.2)	21.40 (543.6)	19.06 (484.1)	7.27 (184.7)	
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)	

\*\* Dimensions reflect valve with installed silencer.



## REPLACEMENT VALVES (VALVE ONLY NO BASE)

**MODEL NUMBER CONFIGURATOR** **3-Way 2-Position Valves**

**DM2C** **D** **B2X** **A** **2** **X**  

Series

Thread

G	D
NPT	N

Reset Type

Solenoid

**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.

Status Indicator

None

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

\* For other voltages consult ROSS.  
\*\* 230 V AC not available in the U.S. (OSHA regulations limit 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	Exhaust		G Thread	NPT Thread	
2	1/4	1/4	3/4	No	YD1872C91	Y1872C91	1.7 (0.8)
				Yes	YD1873C91	Y1873C91	2.1 (1.0)
	3/8	3/8	3/4	No	YD1874C91	Y1874C91	1.7 (0.8)
				Yes	YD1875C91	Y1875C91	2.1 (1.0)
4	1/2	1/2	1	No	YD1697C91	Y1697C91	1.7 (0.8)
				Yes	YD1698C91	Y1698C91	2.3 (1.1)
8	3/4	3/4	1	No	YD1701C91	Y1701C91	3.6 (1.6)
				Yes	YD1702C91	Y1702C91	4.2 (1.9)
	1	1	1	No	YD1703C91	Y1703C91	3.6 (1.6)
				Yes	YD1704C91	Y1704C91	4.2 (1.9)
12	1	1	1-1/2	No	YD1705C91	Y1705C91	6.2 (2.8)
				Yes	YD1706C91	Y1706C91	6.8 (3.1)
30	1-1/2	2	2-1/2	No	YD1709C91	Y1709C91	12.0 (5.4)
				Yes	YD1710C91	Y1710C91	12.6 (5.7)

