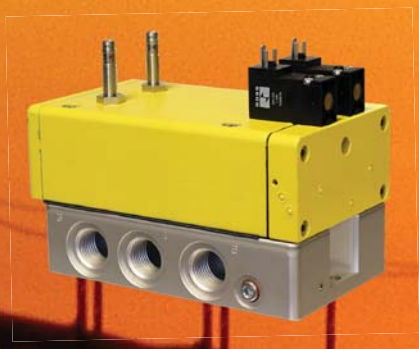
ROSS®

BULLETIN 510

New



Pneumatic Machine Safeguarding Solutions

Complete Your System with ROSS CONTROLS® Safety-Related Products

SAFETY INFORMATION

Fluid Power Safety for Machine Guarding Book

- **Overview of topics related to the safe application of fluid power in industrial applications –** Topics include Control Integrity, Control Categories, Lockout-Tagout, Alternative Lockout-Tagout, Risk Assessment, Risk Assessment as Related to Fluid Power, Clutch/Brake Controls for Mechanical Stamping Presses, Understanding the Function of Counterbalance on Mechanical Stamping Presses, and FAQ's.

Fluid Power Safety Risk Locator Program - provides guidance to areas of possible safety concerns for closer examination (electronic format, downloadable from the Safety Industry page at www.rosscontrols.com)

ROSS Safety-related Applications

- **Energy Isolation (LOTO & Alternative Measures):**
  - Whole machine
  - Zone control
  - Single point lockout
  - Monitored Power Systems
  - Partial de-energization
- **Energy Re-application:**
  - Gradual pressure build-up
- **Load holding and/or mid-stroke positioning:**
  - Hazard in one direction (Vertical cylinders)
  - Hazard in both directions (Horizontal cylinders)
- **Cylinder reverse to safe position:**
  - Hazard in one direction
  - Vertical or horizontal cylinders
- **Two hand anti-tie-down control**
- **Safety control for pinch points, tooling or product damage**
- **Stamping-press control:**
  - Clutch/Brake
  - Counterbalance
- **Noise reduction**
- **Hose whip control due to hose or fitting failure**

Various Safety-related Standards that Apply to Pneumatic Air Systems

ANSI/ASSE Z244.1, OSHA 1910.147
Lockout/Tagout Control of Hazardous Energy, Prevention of Unexpected Startup

OSHA 29 CFR 1910.147, ANSI B11.0, RIA 15.06, ISO13849
Machine Safeguarding

ANSI/PMMI B155.1
Safety Requirements for Packaging Machinery

ANSI B11.1, EN 692
Safety Requirements for Mechanical Power Presses

ANSI B11.2, EN 13736
Safety Requirements for Hydraulic and Pneumatic Power Presses

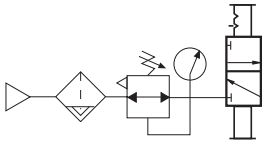
ANSI B11.3
Safety Requirements for Power Press Brakes

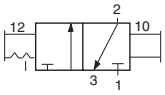
ANSI B11.19
Performance Requirements for Safeguarding

ANSI B11.TR6
Safety Control Systems for Machine Tools

The **Lockout L-O-X®** valve is used to block the supply and remove the downstream pressure from the circuit or machine and allow the employee to lockout the pneumatic energy for safe machine access.
The **Soft-Start EEZ-ON®** valve provides gradual re-application of pneumatic energy to prevent rapid equipment movement at startup.

- Lockable only in the OFF position
- Has a full size exhaust port (equal to or larger than supply)
- Simple push/pull of the large handle provides positive direct manual operation
- Fluorocarbon slipper seals for easy shifting, even after long periods of inactivity
- Integrated sensing port for pressure verification or visual indicator option.





3/2 Manual Lockout L-O-X® Valves

Valve Style	Port Size		Body Size	Valve Model Number		C_v	
	1, 2	3		BSPP Threads	NPT Threads	1-2	2-3
Slim-Line	1/4	3/8	3/8	YD1523D2002	Y1523D2002	1.84	1.79
	3/8	3/8	3/8	YD1523D3012	Y1523D3012	2.67	2.64
Modular	1/4	3/4	3/4	YD1523A2003	Y1523A2003	3.7	7.8
	3/8	3/4	3/4	YD1523A3003	Y1523A3003	5.1	8.3
	1/2	3/4	3/4	YD1523A4003	Y1523A4003	5.5	8.6
	3/4	3/4	3/4	YD1523A5013	Y1523A5013	5.6	8.1
Classic	3/8	3/4	1/2	YD1523C3002	Y1523C3002	4.74	3.57
	1/2	3/4	1/2	YD1523C4002	Y1523C4002	7.10	4.00
	3/4	3/4	1/2	YD1523C5012	Y1523C5012	8.26	4.10
	3/4	1¼	1	YD1523C5002	Y1523C5002	13.12	8.98
	1	1¼	1	YD1523C6002	Y1523C6002	16.56	9.52
	1¼	1¼	1	YD1523C7012	Y1523C7012	19.25	9.74
High-Capacity	1½	2	2	YD1523C8002	Y1523C8002	35.53	50.98
	2	2	2	YD1523C9012	Y1523C9012	40.38	52.23
Stainless Steel Classic	1/4	1/4	1/2	D1523B2004	1523B2004	2.14	2.08
	3/8	1/2	1/2	D1523B3004	1523B3004	5.79	6.24
	1/2	1/2	1/2	D1523B4004	1523B4004	5.79	6.24
	3/4	1	1	D1523B5004	1523B5004	14.30	17.00
	1	1	1	D1523B6004	1523B6004	14.30	17.00
	1½	2	1	D1523B8004	1523B8004	39.00	45.00
	2	2	2	D1523B9004	1523B9004	39.00	45.00


Slim-Line


Modular

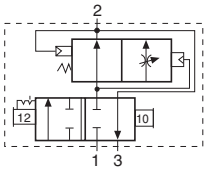

Classic


High-Capacity


Stainless Steel Classic

3/2 Manual Lockout L-O-X® Valves with Soft-Start EEZ-ON®

Valve Style	Port Size		Body Size	Valve Model Number		C_v	
	1, 2	3		BSPP Threads	NPT Threads	1-2	2-3
Modular	1/4	3/4	3/8	YD1523B2103	Y1523B2103	3.7	7.8
	3/8	3/4	3/8	YD1523B3103	Y1523B3103	5.1	8.3
	1/2	3/4	3/8	YD1523B4103	Y1523B4103	5.5	8.6
	3/4	3/4	3/4	YD1523B5113	Y1523B5113	5.6	8.1
Classic	3/8	3/4	1/2	YD1523B3102	Y1523B3102	3.64	2.81
	1/2	3/4	1/2	YD1523B4102	Y1523B4102	4.86	3.51
	3/4	3/4	1/2	YD1523B5112	Y1523B5112	5.09	2.91
	3/4	1¼	1	YD1523B5102	Y1523B5102	10.08	8.56
	1	1¼	1	YD1523B6102	Y1523B6102	11.07	8.45
	1¼	1¼	1	YD1523B7112	Y1523B7112	11.86	8.46

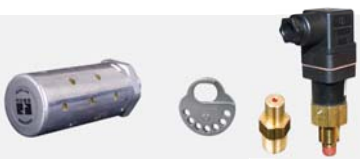



Modular


Classic

Accessories & Options

- Silencers
- Multiple Lockout Device
- Energy Release Verification Options.

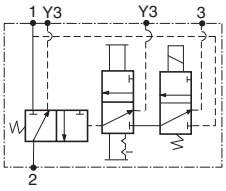


Accessories and options, see page 18 & 20.

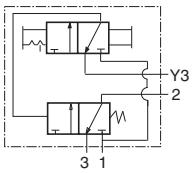
Energy Isolation
Piloted Valves with Lockout or Lockout with Soft-Start

The **Lockout L-O-X®** valve is used to block the supply and remove the downstream pressure from the circuit or machine and allow the employee to lockout the pneumatic energy for safe machine access.
The **Soft-Start EEZ-ON®** valve provides gradual re-application of pneumatic energy to prevent rapid equipment movement at startup.

- Lockable only in the OFF position
- Gradual re-application of pneumatic pressure prevents rapid equipment movement at startup
- Has a full size exhaust port (equal to or larger than supply)
- Simple push/pull of the large blue handle provides positive direct manual operation
- Integrated sensing port for pressure verification or visual indicator option.



3/2 Valves, Solenoid Pilot Controlled

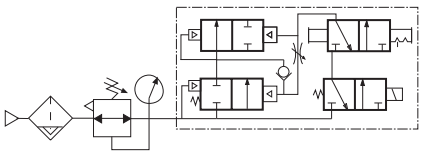


3/2 Valves, Pressure Controlled

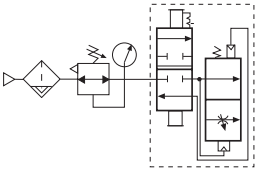
3/2 Piloted Valves with Manual Lockout L-O-X® Control

Valve Style	Port Size		Body Size	Valve Model Number		C_v	
	1, 2	3		BSPP Threads	NPT Threads	1-2	2-3
Solenoid Pilot Controlled*	1/4	1/2	3/8	YD2773A2072Z	Y2773A2072Z	2.5	3.1
	3/8	1/2	3/8	YD2773A3072Z	Y2773A3072Z	3.6	5.3
	1/2	1/2	3/8	YD2773A4082Z	Y2773A4082Z	3.3	5.3
	½	1	3/4	YD2773A4072Z	Y2773A4072Z	6.3	9.2
	¾	1	3/4	YD2773A5072Z	Y2773A5072Z	7.7	11
	1	1	3/4	YD2773A6082Z	Y2773A6082Z	8.0	12
	1	1½	1¼	YD2773A6072Z	Y2773A6072Z	23	34
	1¼	1½	1¼	YD2773A7072Z	Y2773A7072Z	30	32
	1½	1½	1¼	YD2773A8082Z	Y2773A8082Z	30	31
	1½	2½	2	YD2773A8072Z	Y2773A8072Z	68	70
	2	2½	2	YD2773A9072Z	Y2773A9072Z	70	70
	2½	2½	2	YD2773A9082Z	Y2773A9082Z	70	71
	3	2½	3	–	Y3900A0896Z	140	71
Pressure Controlled	1	1½	1¼	YD2783A6006	Y2783A6006	23	34
	1¼	1½	1¼	YD2783A7006	Y2783A7006	30	32
	1½	1½	1¼	YD2783A8016	Y2783A8016	30	31
	1½	2½	2	YD2783A8006	Y2783A8006	68	70
	2	2½	2	YD2783A9006	Y2783A9006	70	70
	2½	2½	2	YD2783A9016	Y2783A9016	70	71
	3	2½	3	–	Y3900A0829	140	71

After energy isolation has been completed the rapid introduction of high pressure can cause motion and unnecessary machine wear or damage. The L-O-X® valve with soft-start EEZ-ON® function features all the advantages of the L-O-X® with the added benefit of causing the pressure to increase gradually allowing for a controlled motion to occur.



3/2 Valves, Solenoid Pilot Controlled



3/2 Valves, Pressure Controlled

3/2 Piloted Valves with Manual Lockout L-O-X® with Soft-Start Control Function

Valve Style	Port Size		Body Size	Valve Model Number		C_v	
	1, 2	3		BSPP Threads	NPT Threads	1-2	2-3
Solenoid Pilot Controlled*	1/4	1/2	3/8	YD2773B2075Z	Y2773B2075Z	2.5	3.1
	3/8	1/2	3/8	YD2773B3075Z	Y2773B3075Z	3.6	5.3
	1/2	1/2	3/8	YD2773B4085Z	Y2773B4085Z	3.3	5.3
	1/2	1	3/4	YD2773B4075Z	Y2773B4075Z	6.3	9.2
	3/4	1	3/4	YD2773B5075Z	Y2773B5075Z	7.7	11
	1	1	3/4	YD2773B6085Z	Y2773B6085Z	8.0	12
	1	1½	1¼	YD2773B6075Z	Y2773B6075Z	23	34
	1¼	1½	1¼	YD2773B7075Z	Y2773B7075Z	30	32
	1½	1½	1¼	YD2773B8085Z	Y2773B8085Z	30	31
Pressure Controlled	1/4	1/2	3/8	YD2783B2055	Y2783B2055	2.5	3.1
	3/8	1/2	3/8	YD2783B3055	Y2783B3055	3.6	5.3
	1/2	1/2	3/8	YD2783B4065	Y2783B4065	3.3	5.3
	1/2	1	3/4	YD2783B4055	Y2783B4055	10.0	13.0
	3/4	1	3/4	YD2783B5055	Y2783B5055	12.0	15.0
	1	1	3/4	YD2783B6065	Y2783B6065	12.0	16.0
	1	1½	1¼	YD2783A6055	Y2783A6055	23.0	34.0
	1½	1½	1¼	YD2783A7055	Y2783A7055	30.0	32.0
	1½	1½	1¼	YD2783A8065	Y2783A8065	30.0	31.0

*__Voltage:__ 110-120 volts AC, 50/60. For 24 volts DC replace "Z" with a "W", e.g., YD2773A2072W. For other voltages, consult ROSS.

Accessories & Options

- Energy Release Verification Options
- Multiple Lockout Device
- Silencers.

Accessories and options, see page 20 & 21.

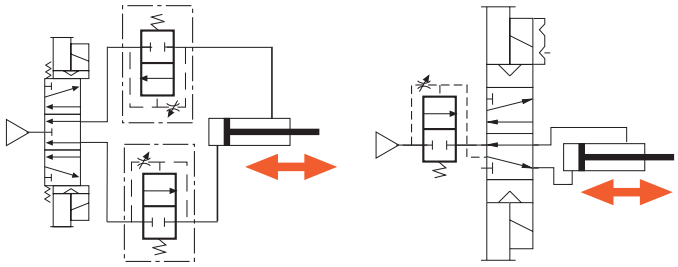
Soft-Start EEZ-ON® valve provides gradual re-application of pneumatic energy to prevent rapid equipment movement at startup.

Right-Angle Soft-Start EEZ-ON® Valves – 19 Series

- Right angle style mounts directly in cylinder ports
- Available with threaded ports or push-in-tubing ports
- Point of use Soft-Start.

Soft-Start EEZ-ON® Valves – 27 Series

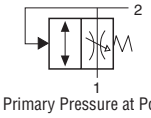
- Large exhaust port exceeds inlet size for rapid release of pressure
- Solenoid pilot or pressure controlled.



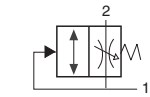
2/2 Soft-Start EEZ-ON® Valves

Valve Style	Port Size 1	Port Size 2	Body Size	Valve Model Number BSPP Threads	Valve Model Number NPT Threads	Avg. C_v
Right-Angle with Threaded Banjo*	1/4	1/4	3/8	D1969B2010	1969B2010	1.2
	3/8	3/8	3/8	D1969B3010	1969B3010	1.7
Pressure Controlled	1/4	1/4	3/8	D2781A2007	2781A2007	2.3
	3/8	3/8	3/8	D2781A3007	2781A3007	3.8
	1/2	1/2	3/8	D2781A4017	2781A4017	4.0
	1/2	1/2	3/4	D2781A4007	2781A4007	13.0
	3/4	3/4	3/4	D2781A5007	2781A5007	15.0
	1	1	3/4	D2781A6017	2781A6017	16.0
	1	1	1¼	D2781A6007	2781A6007	24.0
	1¼	1¼	1¼	D2781A7007	2781A7007	29.0
	1½	1½	1¼	D2781A8017	2781A8017	29.0

* Port 1 with female threads, port 2 with male threads.

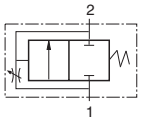


Primary Pressure at Port 1



Primary Pressure at Port 2

Right-Angle with Threaded Banjo

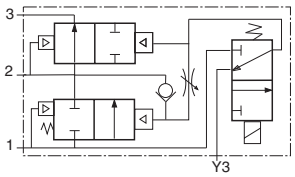


2/2 Valves, Pressure Controlled

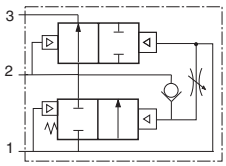
3/2 Soft-Start EEZ-ON® Valves

Valve Style	Port Size 1, 2	Port Size 3	Body Size	Valve Model Number BSPP Threads	Valve Model Number NPT Threads	C_v 1-2	C_v 2-3
Solenoid Pilot Controlled*	1/4	1/2	3/8	D2773B2037Z	2773B2037Z	2.5	3.1
	3/8	1/2	3/8	D2773B3037Z	2773B3037Z	3.6	5.3
	1/2	1/2	3/8	D2773B4047Z	2773B4047Z	3.3	5.3
	1/2	1	3/4	D2773B4037Z	2773B4037Z	10.0	13.0
	3/4	1	3/4	D2773B5037Z	2773B5037Z	12.0	15.0
	1	1	3/4	D2773B6047Z	2773B6047Z	12.0	16.0
	1	1½	1¼	D2773A6037Z	2773A6037Z	23.0	34.0
	1¼	1½	1¼	D2773A7037Z	2773A7037Z	30.0	32.0
	1½	1½	1¼	D2773A8047Z	2773A8047Z	30.0	31.0
Pressure Controlled	1/4	1/2	3/8	D2783C2037	2783C2037	2.5	3.1
	3/8	1/2	3/8	D2783C3037	2783C3037	3.6	5.3
	1/2	1/2	3/8	D2783C4047	2783C4047	3.3	5.3
	1/2	1	3/4	D2783C4037	2783C4037	10.0	13.0
	3/4	1	3/4	D2783C5037	2783C5037	12.0	15.0
	1	1	3/4	D2783C6047	2783C6047	12.0	16.0
	1	1½	1¼	D2783B6037	2783B6037	23.0	34.0
	1¼	1½	1¼	D2783B7037	2783B7037	30.0	32.0
	1½	1½	1¼	D2783B8047	2783B8047	30.0	31.0

***Voltage:** 110-120 volts AC, 50/60. For 24 volts DC replace "Z" with a "W", e.g., D2773B2037W. For other voltages, consult ROSS.



3/2 Valves, Solenoid Pilot Controlled



3/2 Valves, Pressure Controlled

Accessories

- Silencers.

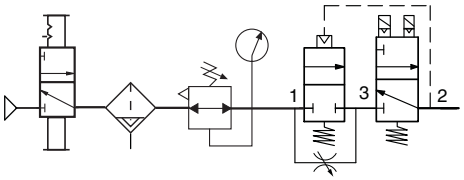
Silencers, see page 21.

Safety Exhaust (Dump)
Control Reliable Double Valves for External Monitoring

The M35 Series valve is designed to supply air to a zone or entire machine/system until signaled to shut off and exhaust residual downstream pneumatic energy from the machine. Thus, reducing the hazards associated with the presence of residual energy during employee access and/or minor servicing. The safety function of the M35 Series valve is to shut off supply of pneumatic energy and to exhaust any pneumatic energy from downstream of the valve. The function of the optional integrated EEZ-ON® (soft start) module is to, on energization, allow outlet pressure to increase at a slower than normal rate until it reaches approximately 50% of inlet pressure, at which point the valve will then open fully to finish filling the system at full flow rate.

(Certifications pending)

- Pressure sensors - allows for external monitoring of valve state
- Highly contaminant-tolerant poppet construction
- Modular or threaded port connection - allows modular connection to air entry system (Lockout Valve, FRL)
- Optional EEZ-ON® (soft-start) module - allows slower build-up of pressure during start-up
- LED indicators - aids troubleshooting (power on main solenoids, feedback pressure sensors, and fault/no fault condition)
- High-flow, clog-resistant silencer - reduces actuation/de-actuation noise and no back pressure from clogging.



These valves are not designed for controlling clutch/brake mechanisms on mechanical power presses.

M35 Series – 3/2 Double Valves with or without EEZ-ON® (Soft-Start) Module

Model with Soft-Start shown

Choose your options (in red) to configure your valve model number.

M35	S	40	G	A	E	X	AA	G	A
Series	Soft-Start Function	Port Size	Thread	Voltage	Monitoring	Communication	Pin Configuration Combinations*	Pressure Gauge	Revision Level

Series

Soft-Start Function

With Soft-Start	S
No Soft-Start	X

Port Size

Inlet	Outlet	
1/2	1/2	40
3/4	3/4	50

Thread

BSPP	G
NPT	N

Voltage

24 volts DC	A

Monitoring

External	E

Communication

None	X

Pin Configuration Combinations*

Solenoid	Sensor	
A	A	AA
A	B	AB
A	C	AC
C	C	CC
D	B	DB
D	C	DC

*See pinouts below.

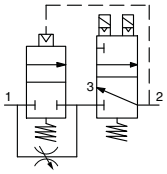
Pressure Gauge

With Gauge	G
No Gauge	X

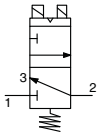
Revision Level

Port Size	Basic Size	Soft Start	C_V 1-2	C_V 2-3
1/2	8	With	4.3	7.5
1/2	8	Without	4.1	7.5
3/4	8	With	4.3	7.5
3/4	8	Without	4.1	7.5

Simplified Schematics



With EEZ-ON® Soft Start module



Without EEZ-ON® Soft Start module

Air Entry Assemblies – M35 Series Double Valves, Manual Lockout L-O-X® Valves and FRL's

» Category 4 with Manual L-O-X® and M35 Series valves.

Choose your options (in red) to configure your valve model number.

M35	S	L	R	2U	40	G	A	E	X	AA	G	A
Series	M35 Valve	Lockout Valve Type	Filter, Regulator, Lubricator	Extra Port	Port Size	Thread	Voltage	Monitoring	Communication	Pin Configuration Combinations*	Pressure Gauge	Revision Level

Series

M35 Valve

With Soft-Start	S
No Soft-Start	X

Lockout Valve Type

L-O-X®*	L
Modular L-O-X®*	M
No L-O-X®	X
* Silencer Included.	

Filter, Regulator, Lubricator

Integrated Filter/Regulator	F
Filter and Regulator	**R**
Filter, Regulator,and Lubricator	L

Extra Port (in relation to M35 valve)

Location	Size	Code	Location	Size	Code
Upstream	**1/4**	**2U**	Downstream	1/2	4D
Upstream	3/8	3U	Both	1/4	2B
Upstream	1/2	4U	Both	3/8	3B
Downstream	1/4	2D	Both	1/2	4B
Downstream	3/8	3D	None	NA	XX

Port Size

Inlet	Outlet	
1/2	1/2	40
3/4	3/4	50

Thread

BSPP	G
NPT	N

Voltage

24 volts DC	A

Monitoring

External	E

Communication

None	X

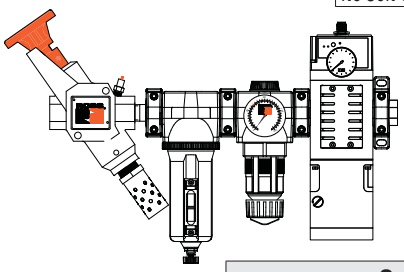
Pressure Gauge (for M35 valve)

With Gauge	G
No Gauge	X

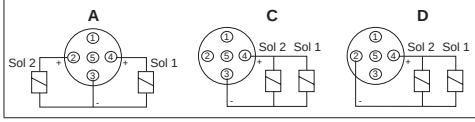
Revision Level

Pin Configuration Combinations*

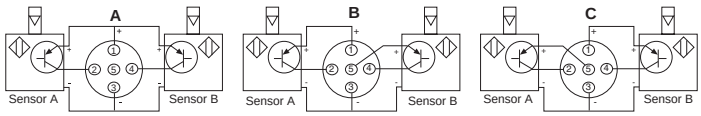
Solenoid	Sensor	
A	A	AA
A	B	AB
A	C	AC
C	C	CC
D	B	DB
D	C	DC



Solenoid Pinouts



Pressure Sensor Pinouts



Accessories & Options

- Wiring Kits
- Mounting Brackets & Module Connections.

Accessories & Options, see page 19 & 20.

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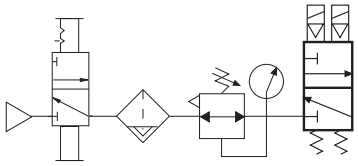
applications

The Safety Shut-Off and exhaust valve is a dual valve 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.

- Status Indicator switch for valve condition (ready to run) feedback
- Highly contaminant-tolerant poppet construction
- Status indicator switch optional
- Sistema library data available
- *Explosion proof solenoid pilot available.*

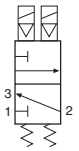
These valves are not designed for controlling clutch/brake mechanisms on mechanical power presses.



DM[1] Series C – 3/2 Double Valves with Dynamic Monitoring and Automatic Reset

Choose your options (in red) to configure your valve model number.

» Self-contained dynamic monitoring system
» Rapid response time to minimize stopping time
» Automatic reset by de-energizing solenoids.



DM1C	N	A	42	A	3	1	
Series					Automatic Reset Type		

Thread

BSPP	D
NPT	N

Revision Level

Basic Size 4, 8,	A
Basic Size 2	B

Basic Size	Port Size Inlet	Port Size Outlet	
2	1/4 3/8	1/4 3/8	20 21
	Valve Only (No Base)		2X
4	**1/2**	**1/2**	**42**
	Valve Only (No Base)		4X
8	3/4 1	3/4 1	54 55
	Valve Only (No Base)		5X

Voltage*

24 volts DC	**A**
110 volts AC, 50 Hz 120 volts AC, 50/60 Hz	B

* For other voltages consult ROSS.

Status Indicator

Yes	1
No	X

Other OPTIONS*

EN 175301-803 Form A (connector not included)	**Leave Blank**
M12 (connector included)	005
Silicone Free with EN 175301-803 Form A (connector not included)	030
Silicone Free with M12 (connector included)	035

*See options for connectors or wiring kits.

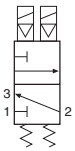
Basic Size	Inlet Port Size	Cv 1-2	Cv 2-3
2	1/4	1.67	2.61
	3/8	2.17	2.61
4	1/2	3	10
8	3/4	4.2	13
	1	4.4	13

Accessories and options available, see page 20 thru 22.

DM[2®] Series C – 3/2 Double Valves with Dynamic Monitoring and Memory

» Dynamic memory of abnormal function retains lockout condition and this prevents unintentional reset with removal of air or electricity
» Self-contained dynamic monitoring system requires no additional valve monitoring controls
» Dedicated Reset Signal Required
» Rapid response time to minimize stopping time.

Choose your options (in red) to configure your valve model number.



DM2C	N	A	42	A	2	1	
Series					Solenoid Reset Type		

Thread

BSPP	D
NPT	N

Revision Level

Basic Size 4, 8, 12, 30	A
Basic Size 2	B

Basic Size	Port Size Inlet	Port Size Outlet	
2	1/4 3/8	1/4 3/8	20 21
	Valve Only (No Base)		2X
4	**1/2**	**1/2**	**42**
	Valve Only (No Base)		4X
8	3/4 1	3/4 1	54 55
	Valve Only (No Base)		5X
12	1	1	66
	Valve Only (No Base)		6X
30	1½	2	88
	Valve Only (No Base)		8X

Voltage*

24 volts DC	**A**
110 volts AC, 50 Hz 120 volts AC, 50/60 Hz	B

* For other voltages consult ROSS.

Status Indicator

Yes	1
No	X

Other OPTIONS*

EN 175301-803 Form A (connector not included)	**Leave Blank**
M12 (connector included)	005
Silicone Free with EN 175301-803 Form A (connector not included)	030
Silicone Free with M12 (connector included)	035

*See options for connectors or wiring kits.

Basic Size	Inlet Port Size	Cv 1-2	Cv 2-3
2	1/4	1.67	2.61
	3/8	2.17	2.61
4	1/2	3	10
8	3/4	4.2	13
	1	4.4	13
12	1	8.5	20
30	1½	22	64

Accessories and options available, see page 20 thru 22.

Air Entry Assemblies – DM[2®] Series C Double Valves, Manual L-O-X® Valves and Filter & Regulator

» Category 4 with Manual L-O-X® and DM[1] or DM[2®] Series C valves.

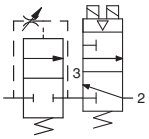
Air Entry Assemblies	Port Size 1, 2	Port Size 3	Model Number*	Air Entry Type	Cv 1-2	Cv 2-3
Cat-4 with DM2® Series C	1/2	1/2	RC408-06Z	FR	3	10
	3/4	3/4	RC412-06Z	FR	4.4	13
	3/4	3/4	RC412L-06Z	FR	3	10

* NPT pressure port threads. Standard unit supplied with metal bowl and manual drain. **Voltage:** 110-120 volts AC, 50/60. For 24 volts DC replace "Z" with a "W", e.g., RC408-06W. M12 connectors available, consult ROSS.

Safety Exhaust (Dump)
Control Reliable Double Valves with Dynamic Monitoring and Memory

The Safety Shut-Off and exhaust valve is a dual valve 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 employ to complete their tasks and safely and rapidly.

- Soft start application of air to the system when energized; can be adjusted for slower or faster buildup of system pressure
- Dynamic memory of abnormal function retains lockout condition, thus, preventing unintentional reset with removal of air or electricity
- Self-contained dynamic monitoring system requires no additional valve monitoring controls
- Dedicated reset signal required
- Rapid response time to minimize stopping time.



These valves are not designed for controlling clutch/brake mechanisms on mechanical power presses.

M DM²® Series C with Integrated EEZ-ON® Soft Start – 3/2 Double Valves

» Dedicated Reset Signal Required.

Choose your options (in red) to configure your valve model number.

MDM2C	N	A	55	A	2	3
Series	Thread	Revision Level	Basic Size / Port Size	Voltage	Solenoid Reset Type	Transducer

Thread

BSPP	D
NPT	N

Basic Size / Port Size

Basic Size	Port Size Inlet	Port Size Outlet	
8	3/4	3/4	55

Voltage

24 volts DC	A

Solenoid Reset Type

Yes	3
No	1

Transducer

Yes	3
No	1

Inlet Port Size	Basic Size	C_V 1-2	C_V 2-3
3/4	8	3.7	8.5

Air Entry Assemblies – M DM²® Series C Double Valves with Integrated EEZ-ON® Soft Start, Manual Lockout L-O-X® Valves with Integrated Filter/Regulators

» Category 4 with Manual L-O-X® and DM¹ or DM²® Series C valves.

Choose your options (in red) to configure your valve model number.

M	5	1	1	X	A	2	1	2	1	1
Series	Port Size	Lockout Valve Type	Filter-Regulator	Lubricator Fill Type	Extra-Ports (Prior to M DM2® Exhaust Valve)		M DM2® Valve	Extra Ports (Downstream of M DM2®)	Downstream Pressure Switch (includes 1/4" Extra Port)	Cable Options

Port Size

1/2 NPTF	4
3/4 NPTF	5
1/2 BSPP	D
3/4 BSPP	E

Lockout Valve Type

Modular L-O-X®*	1
L-O-X®*	2
No L-O-X®	X

* Silencer Included.

Filter-Regulator (0-125 psi with 0-200 gauge)

5 Micron, Manual Drain, Metal Bowl	1
5 Micron, Auto Drain, Metal Bow	2
None	X

Lubricator Fill Type

Fill Port	2
No lubricator	X

Extra-Ports (Prior to M DM2® Exhaust Valve)

1/4	2
3/8	3
1/2	4
None	X

M DM2® Valve

Without Transducer	1
With Transducer	3

Extra Ports (Downstream of M DM2®)

1/4	2
3/8	3
1/2	4
None	X

Downstream Pressure Switch (includes 1/4" Extra Port)

586A86	1
None	X

Cable Options

Yes	1
No	X

Digital Pressure Transducer

» Precision digital pressure transducer with 5 pin female connection
» For external monitoring of downstream pressure.

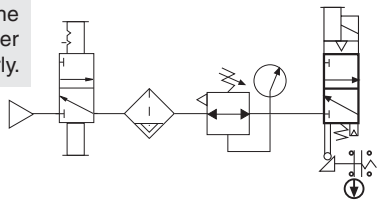
Model Number	2447H77

- Two PNP digital outputs which may be set individually, 4-20 mA analog output
- Three operation modes: Easy, Window and Hysteresis
- Selectable response times to eliminate output chattering
- Powered by 12-24 vots DC
- 6 pressure unit conversions
- Lockable keypad
- Fast zero reset.

Wiring Kits

Kit Number	Length
2431H77	Wiring Kit - 5 meters (16.4 feet). Includes two cords, and the cord grips.
2432H77	Wiring Kit with Transducer - 5 meters (16.4 feet). Includes three cords, and the cord grips.

The SV27 Series Sensing Valve uses a safety-rated DPST switch to monitor the valve's operating position. The SV27 3/2 valve can be used for safe shut-off and exhaust functions for Category 2 applications with proper integration and monitoring. The feedback switch informs the controls that the valve internals have shifted properly.



- Electrical feedback via DPST switch (Double-Pole Single-Throw)
- Direct-operated safety-rated switch (DPST)
- Poppet construction for near zero leakage & dirt tolerance
- A diagnostic coverage of 99% for 3/2 valves can be obtained by monitoring the safety switch status
- Integrated sensing port for pressure verification or visual indicator
- Sistema library data available.

SV27 Series with Sensing – 3/2 Normally Closed Valves

Choose your options (in red) to configure your valve model number.

SV27 D C 30 540 7PS AA 1A

Series

Thread	
BSPP	D
NPT	N

Revision Level

Function

3/2	30

Body Size	Port Size Inlet	Port Size Outlet	
3/4	1/2	1/2	540
	3/4	3/4	550
	1	1	560
1¼	1	1½	760
	1¼	1½	770
	1½	1½	780
2	1½	2½	980
	2	2½	990
	2½	2½	995

Inline Mounted

Actuation

Solenoid Pilot	7PS
Pressure Controlled	5AS

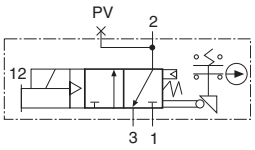
Voltage* (Solenoid Pilot only)

24 volts DC	1D
110-120 volts AC, 50/60 Hz	**1A**
Pressure Controlled	Leave Blank

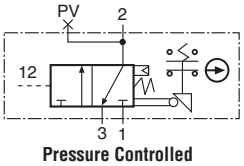
* For other voltages consult ROSS.

» Has a full size exhaust port (equal to or larger than supply).

Port Size 1, 2	Port Size 3	Body Size	C_v 1-2	C_v 2-3
1/2	1	3/4	6.3	9.2
3/4	1	3/4	7.7	11
1	1	3/4	8.0	12
1	1½	1¼	23	34
1¼	1½	1¼	30	32
1½	1½	1¼	30	31
1½	2½	2	68	70
2	2½	2	70	70
2½	2½	2	70	71



Solenoid Pilot Controlled



Pressure Controlled

SV27 Series with Sensing – 3/2 Normally Closed Valves, with Manual Lockout L-O-X® Function

Choose your options (in red) to configure your valve model number.

SV27 D C 3L 540 7PS AA 1A

Series

Thread	
BSPP	D
NPT	N

Revision Level

Function

3/2 with L-O-X®	3L

Body Size	Port Size Inlet	Port Size Outlet	
3/4	1/2	1/2	540
	3/4	3/4	550
	1	1	560
1¼	1	1½	760
	1¼	1½	770
	1½	1½	780

Inline Mounted

Actuation

Solenoid Pilot	7PS
Pressure Controlled	5AS

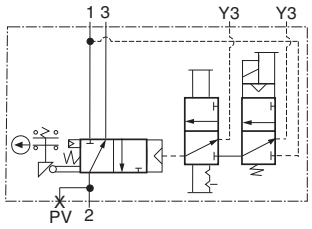
Voltage* (Solenoid Pilot only)

24 volts DC	1D
110-120 volts AC, 50/60 Hz	**1A**
Pressure Controlled	Leave Blank

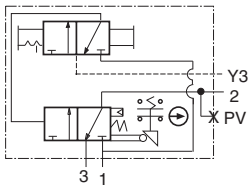
* For other voltages consult ROSS.

» Has a full size exhaust port (equal to or larger than supply)
» Easily identified by red handle
» Lockable only in the OFF position
» Simple push/pull of the large red handle accommodates reduced manual actuation forces and easy operation.

Port Size 1, 2	Port Size 3	Body Size	C_v 1-2	C_v 2-3
1/2	1	3/4	6.3	9.2
3/4	1	3/4	7.7	11
1	1	3/4	8.0	12
1	1½	1¼	23	34
1¼	1½	1¼	30	32
1½	1½	1¼	30	31



Solenoid Pilot Controlled



Pressure Controlled

Preassembled Wiring Kits

Valve Type	Kit Number*	No of Cables	Length meters (feet)
Solenoid Pilot	2239H77	2	4 (13.1)
Solenoid Pilot	2240H77	2	10 (32.8)
Pressure Controlled	2241H77	1	4 (13.1)
Pressure Controlled	2242H77	1	10 (32.8)

* Cable has one connector.

Accessories & Options

- Energy Release Verification Options
- Multiple Lockout Device
- Silencers.

Accessories and options, see page 18 & 20.

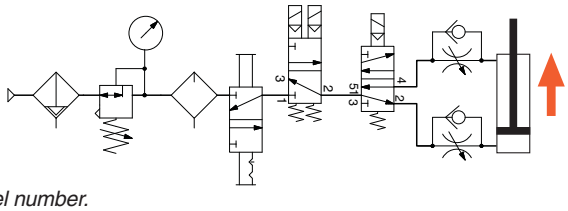
Safety Exhaust (Dump)
Control Reliable Double Valves for External Monitoring

RSe Series – 3/2 Safety Exhaust Double Valves

The RSe Series double valves are redundant 3/2 valves for external monitoring, that are designed to meet the needs and requirements of safe air supply/exhaust applications for machinery with pneumatic controls.

(Certifications pending)

- Rapid response for minimum actuating time
- Status indicator provides valve condition (ready-to-run) feedback
- Position sensors for valve fault monitoring – external monitoring device required
- Well-proven spool valve design for reliable, smooth function
- Pressure range: 40 to 145 psig (3 to 10 bar) , 0 to 145 psig (0 to 10) bar with external pilot supply (EPS), EPS port is a standard feature
- Base-mounting design.



Choose your options (in red) to configure your valve model number.

RSe	3	E	D	A	10	A	3	1	P
Series		External Monitoring		Revision Level		Automatic Reset	Sensor Feedback	Sensor	

Type/Function

3/2	3

Thread

BSPP	D
NPT	N

Base Port Size

Inlet	Outlet	
1/8	1/8	10
1/4	1/4	20
1/2	1/2	40

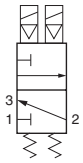
Voltage

24 volts DC	A

Sensor

Sensor Output PNP	P

Port Size	C_v 1-2	C_v 2-3
1/8	0.44	1
1/4	0.7	1.47
1/2	1.9	3.85



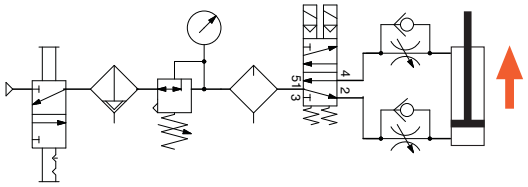
Safe Cylinder Return
Control Reliable Double Valves for External Monitoring

RSe Series – 5/2 Safe Cylinder Return Double Valves

The RSe Series double valves are redundant 5/2 valves for external monitoring, that are designed to meet the needs and requirements of safe cylinder return (5/2 Valves) applications for machinery with pneumatic controls.

(Certifications pending)

- Rapid response for minimum actuating time
- Status indicator provides valve condition (ready-to-run) feedback
- Position sensors for valve fault monitoring – external monitoring device required
- Well-proven spool valve design for reliable, smooth function
- Pressure range: 40 to 145 psig (3 to 10 bar) , 0 to 145 psig (0 to 10) bar with external pilot supply (EPS), EPS port is a standard feature
- Base-mounting design.



Choose your options (in red) to configure your valve model number.

RSe	6	E	D	A	10	A	3	1	P
Series		External Monitoring		Revision Level		Automatic Reset	Sensor Feedback	Sensor	

Type/Function

5/2	6

Thread

BSPP	D
NPT	N

Base Port Size

Inlet	Outlet	
1/8	1/8	10
1/4	1/4	20
1/2	1/2	40

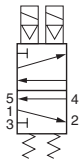
Voltage

24 volts DC	A

Sensor

Sensor Output PNP	P

Port Size	C_v 1-2	C_v 1-4	C_v 2-3	C_v 4-5
1/8	0.85	0.58	0.49	0.75
1/4	0.98	0.79	0.69	0.85
1/2	2.07	1.54	1.51	1.81



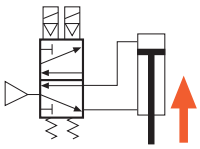
These valves are not designed for controlling clutch/brake mechanisms on mechanical power presses.

Accessories & Options

- Wiring Kits
- Electrical Connectors
- Silencers.

Accessories & Options, see page 19 & 21.

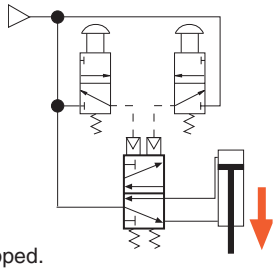
The CrossMirror® Series is a dual 5/2 spring return valve that when de-energized or a fault occurs will allow an actuator such as a cylinder to reverse and return to the safe position. Typical applications include vertical cylinder presses, but also any double-acting cylinder control where there is a potential crushing or amputation hazard. The CrossMirror® Series returns an actuator to a safe position so that an employee may have safe access to equipment that contains pneumatically controlled double-acting cylinder hazards.



CE

ISO 13849-1:2006
Category 4 PL e
applications

- Self-contained dynamic monitoring system requires no additional valve monitoring controls
- Status indication switch (ready-to-run) to inform machine controller of valve condition
- Sistema library data available
- *Explosion proof solenoid pilot available.*



Solenoid Pilot Controlled

» Status indication switch (ready-to-run) to inform machine controller of valve condition.

Pressure Controlled for 2-Hand Control Applications

» Requires two inputs within 500 ms
» Senses asynchronous inputs and valve actuation via dynamic internal monitoring
» Asynchronous inputs result in a fault condition where pressure is applied to port 2
» Status indication switch available to be integrated with electrical safety control system where equipped.

These valves are not designed for controlling clutch/brake mechanisms on mechanical power presses.

Meets Standards EN13736 and ANSI B11.2, Safety requirements for Pneumatic Cylinder Presses and other hazardous pneumatic cylinder applications.

CM Series CrossMirror® – 5/2 Double Valves

- Valve fault results in a lockout condition and prevents unintentional reset with removal of air or electricity
- Requires an overt act to reset unit after lockout
- Manifoldable for multi valve applications

DGUV Test HSM 15026 Sicherheit geprüft tested safety

Valve Function	Connection Type	Port Sizes 1	Port Sizes 2, 4	Basic Size	Reset	Model Number with Pressure Switch* BSPP Threads	Model Number with Pressure Switch* NPT Threads	Model Number without Pressure Switch** BSPP Threads	Model Number without Pressure Switch** NPT Threads	C_v 1-2	C_v 1-4	C_v 2-3	C_v 4-5
5/2 Solenoid Pilot Controlled	EN 175301-803 Form C	1/4	1/4	0	Remote	CM26PDA00A11	CM26PNA00A11	CM26PDA00B1X	CM26PNA00B1X	0.8	0.6	0.5	1.1
		1/4	1/4	0	Solenoid	CM26PDA00A21	CM26PNA00A21	CM26PDA00B2X	CM26PNA00B2X	0.8	0.6	0.5	1.1
		3/8	3/8	0	Remote	CM26PDA01A11	CM26PNA01A11	CM26PDA01B1X	CM26PNA01B1X	0.8	0.6	0.5	1.1
		3/8	3/8	0	Solenoid	CM26PDA01A21	CM26PNA01A21	CM26PDA01B2X	CM26PNA01B2X	0.8	0.6	0.5	1.1
	EN 175301-803 Form A	1/2	1/2	2	Remote	CM26PDA22A11	CM26PNA22A11	CM26PDA22B1X	CM26PNA22B1X	3.0	2.5	2.0	3.9
		1/2	1/2	2	Solenoid	CM26PDA22A21	CM26PNA22A21	CM26PDA22B2X	CM26PNA22B2X	3.0	2.5	2.0	3.9
5/2 Pressure Controlled	–	1/4	1/4	0	Remote	CM26PDA00P11	CM26PNA00P11	CM26PDA00B1X	CM26PNA00B1X	0.8	0.6	0.5	1.1
	–	3/8	3/8	0	Remote	CM26PDA01P11	CM26PNA01P11	CM26PDA01B1X	CM26PNA01B1X	0.8	0.6	0.5	1.1
	–	1/2	1/2	2	Remote	CM26PDA22P11	CM26PNA22P11	CM26PDA22B1X	CM26PNA22B1X	3.0	2.5	2.0	3.9

* Valve include pressure switches with DIN type connection, for pressure switches with M12 type connection consult ROSS.
****Voltage:** 110-120 volts AC, 50/60. For 24 volts DC replace "B" with an "A", e.g., CM26PDA00A1X.

Preassembled Wiring Kits	Basic Valve Size	Kit Number Connector without Light	Kit Number Lighted Connector 24 Volts DC	Kit Number Lighted Connector 120 Volts AC	Solenoid Connector Type	Length meters (feet)
	0*	2526H77	2529H77-W	2529H77-Z	EN 175301-803 Form A and Form C	5 (16.4)
		2527H77	2530H77-W	2530H77-Z		10 (32.8)
	2#	2283H77	2532H77-W	2532H77-Z	EN 175301-803 Form A	5 (16.4)
		2284H77	2533H77-W	2533H77-Z		10 (32.8)
		2288H77**	–	–	M12	5 (16.4)
		2289H77**	–	–	M12	10 (32.8)

* Each cable has one connector. Kits include 1 cable for the status indicator (EN 175301-803 Form A), and 3 cables (EN 175301-803 Form C) with connector plus a cord grip for each.

Each cable has one connector. **Coil includes light.
Kits include 1 cable for the status indicator, and 3 cables with connector plus a cord grip for each.

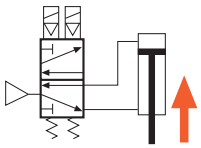
Accessories & Options

- Wiring Kits
- Electrical Connectors
- Energy Release Verification Options.

Accessories & Options, see page 19 & 20.

Safe Cylinder Return Control Reliable Double Valves with Automatic Reset

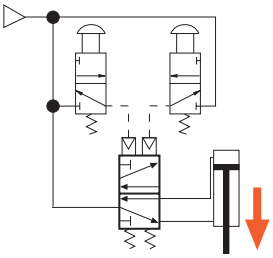
The CrossMirror® Series is a dual 5/2 spring return valve that when de-energized or a fault occurs will allow an actuator such as a cylinder to reverse and return to the safe position. Typical applications include vertical cylinder presses, but also control of any double-acting cylinder where there is a potential crushing or amputation hazard. The CrossMirror® Series returns an actuator to a safe position so that an employee may have safe access to equipment that contains pneumatically controlled double-acting cylinder hazards.



CE

ISO 13849-1:2006 Category 4 PL e applications

- Self-contained dynamic monitoring system requires no additional valve monitoring controls
- Status indication switch (ready-to-run) to inform machine controller of valve condition
- Sistema library data available
- *Explosion proof solenoid pilot available.*



Solenoid Pilot Controlled

» Status indication switch (ready-to-run) to inform machine controller of valve condition.

Pressure Controlled for 2-Hand Control Applications

» Requires two inputs within 500 ms
» Senses asynchronous inputs via status indicator switch
» Asynchronous inputs result in a fault condition where pressure is applied to port 2
» Status indication switch available to be integrated with electrical safety control system where equipped.

These valves are not designed for controlling clutch/brake mechanisms on mechanical power presses.

Meets Standards EN13736 and ANSI B11.2, Safety requirements for Pneumatic Cylinder Presses and other hazardous pneumatic cylinder applications.

77 Series CrossMirror® – 5/2 Double Valves

DGUV Test HSM 13022 Sicherheit geprüft tested safety

DGUV Test HSM 02064 Sicherheit geprüft tested safety

- Applications include small size pneumatic cylinder-operated presses, valve operators, and safety latches
- Automatic reset upon de-actuation

Valve Function	Port Sizes		Basic Size	Model Number				C_v			
				with Pressure Switch#		without Pressure Switch					
	1	2, 4		BSPP Threads	NPT Threads	BSPP Threads	NPT Threads	1-2	1-4	2-3	4-5
5/2 Solenoid Pilot Controlled	1/2	3/8	2	YD7776A3411Z*	Y7776A3411Z*	YD7776A3410Z*	Y7776A3410Z*	2.0	1.6	1.6	2.8
	3/4	1/2	4	YD7776A4421Z*	Y7776A4421Z*	YD7776A4420Z*	Y7776A4420Z*	3.2	3.4	2.7	7.2
	3/4	3/4	4	YD7776A5411Z*	Y7776A5411Z*	YD7776A5410Z*	Y7776A5410Z*	3.2	3.4	2.7	7.2
	SAE 12	SAE 12	4##	SYD7776A4H10Z*	SY7776A4H10Z*	SYD7776A4H11Z*	SY7776A4H11Z*	3.2	3.4	2.7	7.2
5/2 Pressure Controlled	1/2	3/8	2	YD7786A3411Z*	Y7786A3411Z*	YD7786A3410	Y7786A3410	2.0	1.6	1.6	2.8
	3/4	1/2	4	YD7786A4421Z*	Y7786A4421Z*	YD7786A4420	Y7786A4420	3.2	3.4	2.7	7.2
	3/4	3/4	4	YD7786A5411Z*	Y7786A5411Z*	YD7786A5410	Y7786A5410	3.2	3.4	2.7	7.2
	SAE 12	SAE 12	4##	SYD7786A4H11Z*	SY7786A4H11Z*	SYD7786A4H10	SY7786A4H10	3.2	3.4	2.7	7.2

***Voltage:** 110-120 volts AC, 50/60. For 24 volts DC replace "Z" with a "W", e.g., Y7776A3411W. For other voltages consult ROSS.
Valve include pressure switches with DIN type connection, for pressure switches with M12 type connection consult ROSS.\
##Model number includes base.

	Kit Number	Solenoid Connector Type	Length meters (feet)
Preassembled Wiring Kits	2243H77	EN 175301-803 Form A	5 (16.4)
	2244H77	EN 175301-803 Form A	10 (32.8)
	2245H77	M12	5 (16.4)
	2246H77	M12	10 (32.8)

These kits include 2 cables with either EN or M12 connectors for the solenoids. All cables include cord grips.

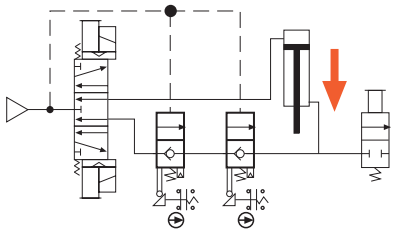
Accessories & Options

- Wiring Kits
- Electrical Connectors
- Energy Release Verification Options.

Accessories & Options, see page 19 & 20.

Load Holding
Single & Dual Pilot Operated Check Valves for External Monitoring

Pilot operated checks are designed to trap pressure in order to hold a cylinder in place when a safety event occurs. The SV27 Series Sensing Valve uses a safety-rated DPST switch to monitor the valve's operating position. The SV27 PO Check valves can be used for load holding functions in Category 2 (single) or Category 3 (redundant) applications with proper integration and monitoring. The feedback switch informs the controls that the valve internals have shifted properly.



- Poppet construction for near zero leakage & dirt tolerance
- Direct-operated safety-rated status switch (DPST)
- A diagnostic coverage (DC) of 90% can be obtained by monitoring the safety switch status
- Sistema library data available.

SV27 Series PO Check with Sensing – 2/2 Normally Closed Valves

Choose your options (in red) to configure your valve model number.

SV27 D C 10 540 8CS AA 1A

Series

Thread

BSPP	**D**
NPT	N

Revision Level

Function

2/2 Normally Closed	**10**
2/2 Redundant NC	55

Body Size	Port Size Inlet	Port Size Outlet	
3/4	**1/2**	**1/2**	**540**
	3/4	3/4	550
	1	1	560
1¼	1	1½	760
	1¼	1½	770
	1½	1½	780

Actuation

Solenoid Pilot	**8CS**
Pressure Controlled	5AS

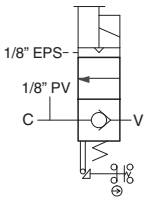
Inline Mounted

Voltage* (Solenoid Pilot only)

24 volts DC	1D
110-120 volts AC, 50/60 Hz	**1A**

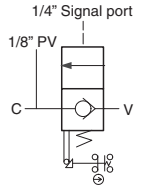
* For other voltages consult ROSS.

Valve Type	Port Size 1, 2	Body Size	C_v 1-2
Single	1/2	3/4	4.5
	3/4	3/4	8.3
	1	3/4	10.3
	1	1¼	20
	1¼	1¼	29
	1½	1¼	33
Redundant	1/2	3/4	3.8
	3/4	3/4	5.6
	1	3/4	8
	1	1¼	12
	1¼	1¼	19
	1½	1¼	22



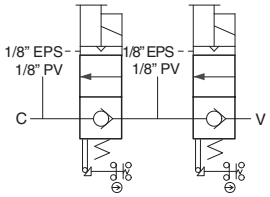
Solenoid Pilot Controlled

CAT 2



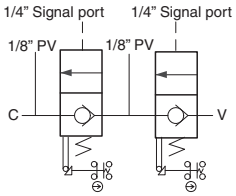
Pressure Controlled

CAT 2



Redundant Solenoid Pilot Controlled

CAT 3



Redundant Pressure Controlled

Preassembled Wiring Kits

Wiring Kits for Solenoid Pilot valves
The wiring kits come with a cord grip on each cable. One cable has a 3-pin MINI connector for the solenoid and one has a 5-pin M12 (Micro) connector for the sensing switch.

Wiring Kits for Pressure Controlled valves
The wiring kits include one cable with a 5-pin M12 connector for the sensing switch, and a cord grip.

Valve Type	Kit Number*	No of Cables	Length meters (feet)
Solenoid Pilot	2239H77	2	4 (13.1)
Solenoid Pilot	2240H77	2	10 (32.8)
Pressure Controlled	2241H77	1	4 (13.1)
Pressure Controlled	2242H77	1	10 (32.8)

* Cable has one connector.

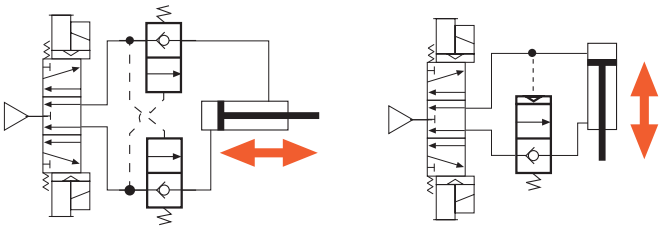
Options

- Energy Release Verification Options.

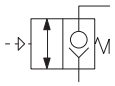
Options, see page 21.

Load Holding
Right Angle Pilot Operated Check Valves - Cylinder Port Mount

Pilot operated checks are designed to trap pressure in order to hold a cylinder in place. Poppet internals use internal pressure to help complete the seal in order to trap pressure and hold the position of the cylinder in place.



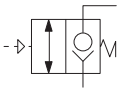
- Poppet construction for near zero leakage
- Cylinder position/load holding applications.



Right-Angle PO Check Valves, Cylinder Position Holding

Valve Function	Port Size*		Valves with BSPP Threads			Valves with NPT Threads			C_v	
	Port 1	Port 2	Valve Model Number	Port 12	Tightening Torque Max. Ft-lb (Nm)	Valve Model Number	Port 12	Tightening Torque Max. Ft-lb (Nm)	1-2	2-1
Right-Angle Threaded Banjo*	1/8	1/8	D1958A1010	M5	7.38 (10)	1958A1010	10-32 UNF	22.13 (30)	0.4	0.4
	1/4	1/4	D1958A2010	M5	8.85 (12)	1958A2010	10-32 UNF	14.75 (20)	0.4	0.4
	3/8	3/8	D1958A3010	M5	14.75 (20)	1958A3010	10-32 UNF	22.13 (30)	0.4	0.4
	1/2	1/2	D1958A4010	M5	22.13 (30)	1958A4010	10-32 UNF	29.50 (40)	0.8	0.7

* Port 1 with female threads, port 2 with male threads.



Right-Angle PO Check Valves, Cylinder Position Holding

Valve Function	Valves with BSPP Threads					Valves with NPT Threads					C_v	
	Port Size**		Valve Model Number	Port 12	Tightening Torque Max. Ft-lb (Nm)	Port Size**		Valve Model Number	Port 12	Tightening Torque Max. Ft-lb (Nm)	1-2	2-1
	Port 1	Port 2				Port 1	Port 2					
Right-Angle Push-to-Connect Fitting**	4 mm	1/8	D1958A1140	M5	7.38 (10)	5/32”	1/8	1958A1115	10-32 UNF	7.38 (10)	0.4	0.4
	6 mm	1/8	D1958A1160	M5	7.38 (10)	1/4”	1/8	1958A1120	10-32 UNF	7.38 (10)	0.4	0.4
	8 mm	1/8	D1958A1180	M5	7.38 (10)	–	–	–	–	7.38 (10)	0.4	0.4
	6 mm	1/4	D1958A2160	M5	8.85 (12	1/4”	1/4	1958A2120	10-32 UNF	8.85 (12	0.8	0.7
	8 mm	1/4	D1958A2180	M5	8.85 (12)	3/8”	1/4	1958A2130	10-32 UNF	8.85 (12)	0.8	0.7
	10 mm	1/4	D1958A2110	M5	8.85 (12)	–	–	–	–	8.85 (12)	0.8	0.7
	8 mm	3/8	D1958A3180	M5	14.75 (20)	3/8”	3/8	1958A3130	10-32 UNF	14.75 (20)	1.2	1.3
	10 mm	3/8	D1958A3110	M5	14.75 (20	–	–	–	–	14.75 (20	1.2	1.3

** Port 1 tubing size in inches (”) or millimeters (mm).

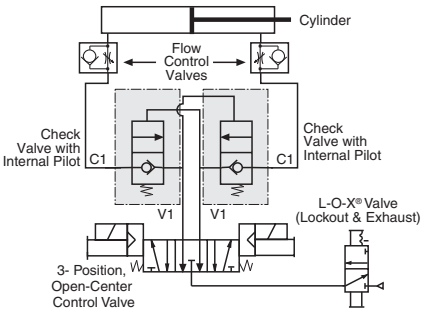
Manual Override	Manual Trapped Pressure Relief Adapter	Port 1	Port 2	Port Threads	Model Number*
		5/32	10-32 Manual Operated Check	NPT	1998A1015
		M5	M5 Manual Operated Check	BSPP	D1998A1010
		* Adapter threads into the signal port.			

Load Holding
Single & Dual Pilot Operated Check Valves with or without Trapped Pressure Relief

Pilot operated checks are designed to trap pressure in order to hold a cylinder in place. Poppet internals use internal pressure to help complete the seal in order to trap pressure and hold the position of the cylinder in place. There are a variety of options for pressure relief such as manual, remote signal, and electrical to meet the requirements of the specific application.

PO Check Valves, Pressure Controlled, Load Holding

Valve Type	Ports Size	Body Size	Valve Model Number		Signal Port	C_v
			BSPP Threads	NPT Threads		
Single, without Trapped Pressure Relief	1/4	3/8	D2751A2903	2751A2903	1/4	2.3
	3/8	3/8	D2751A3901	2751A3901	1/4	3.8
	1/2	3/8	D2751A4902	2751A4902	1/4	4.0
	1/2	3/4	D2751A4905	2751A4905	1/4	7.7
	3/4	3/4	D2751A5903	2751A5903	1/4	9.0
	1	3/4	D2751A6901	2751A6901	1/4	9.0
	1	1¼	D2751B6904	2751B6904	1/4	24
	1¼	1¼	D2751B7901	2751B7901	1/4	29
	1½	1¼	D2751B8902	2751B8902	1/4	29

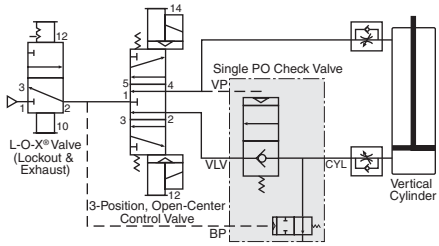


Single, without Trapped Pressure Relief

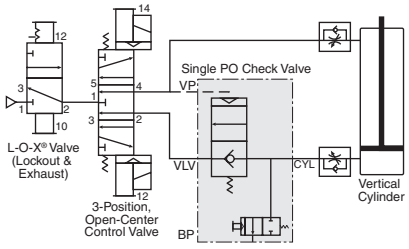
PO Check Valves, Pressure Controlled, Load Holding

Valve Type	Ports Size	Valve Model Number		Signal Port	C_v
		BSPP Threads	NPT Threads		
Single, without Trapped Pressure Relief	1/4	D2751A2908	2751A2908	1/8-27 NPT	2.2
	3/8	D2751A3908	2751A3908	1/8-27 NPT	2.9
	1/2	D2751A4915	2751A4915	1/8-27 NPT	3.2
Single, with Remote Trapped Pressure Relief	3/8	D2751A3922	2751A3922	1/8-27 NPT	2.6
	1/2	D2751A4922	2751A4922	1/8-27 NPT	2.8
	3/4	D2751A5917	2751A5917	1/8-27 NPT	9.2
Single, with Manual Trapped Pressure Relief	3/8	D2751A3920	2751A3920	N/A	2.6
	1/2	D2751A4920	2751A4920	N/A	2.8
	3/4	D2751A5919	2751A5919	N/A	9.2
Dual, without Trapped Pressure Relief	3/8	D2768C3900	2768C3900	1/8-27 NPT	2.9
	1/2	D2768C4900	2768C4900	1/8-27 NPT	3.2
	3/4	D2768C5900	2768C5900	1/8-27 NPT	8.5 #
	1	D2768A6900	2768A6900	1/8-27 NPT	8.5 #
Dual, with Remote Trapped Pressure Relief	3/8	D2768D3901	2768D3901	1/8-27 NPT	2.9
	1/2	D2768D4901	2768D4901	1/8-27 NPT	3.2
	3/4	D2768D5901	2768D5901	1/8-27 NPT	8.5 #
	1	D2768D6901	2768D6901	1/8-27 NPT	8.5 #
Dual, with Manual Trapped Pressure Relief	3/8	D2768D3904	2768D3904	N/A	2.9
	1/2	D2768D4904	2768D4904	N/A	3.2
	3/4	D2768D5904	2768D5904	N/A	8.5#
	1	D2768D6904	2768D6904	N/A	8.5 #

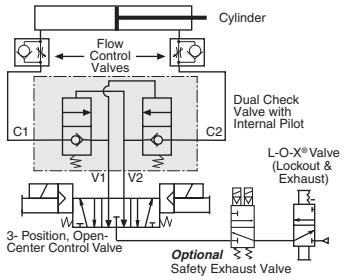
Effective C_v varies with load and pressure drop. Consult ROSS for specifics on your system.



Single, with Remote Trapped Pressure Relief



Single, with Manual Trapped Pressure Relief



Dual, without Trapped Pressure Relief

PO Check Valves, Solenoid Pilot Controlled, Load Holding

Valve Type	Ports Size	Valve Model Number								Signal Port	C_v
		DIN Connector*		3-Pin Mini Connector*		24 Volts DC 3-Pin Mini		24 Volts DC 4-Pin Micro			
		BSPP Threads	NPT Threads	BSPP Threads	NPT Threads	BSPP Threads	NPT Threads	BSPP Threads	NPT Threads		
Dual, Solenoid Controlled, with Remote Trapped Pressure Relief	3/8	D2778D3900Z	2778D3900Z	D2778D3901Z	2778D3901Z	D2778D3902	2778D3902	D2778D3904	2778D3904	1/8-27 NPT	2.9
	1/2	D2778D4900Z	2778D4900Z	D2778D4901Z	2778D4901Z	D2778D4902	2778D4902	D2778D4904	2778D4904	1/8-27 NPT	3.2
	3/4	D2778D5900Z	2778D5900Z	D2778D5901Z	2778D5901Z	D2778D5902	2778D5902	D2778D5904	2778D5904	1/8-27 NPT	8.5 #
	1	D2778D6900Z	2778D6900Z	D2778D6901Z	2778D6901Z	D2778D6902	2778D6902	D2778D6904	2778D6904	1/8-27 NPT	8.5 #

***Voltage:** 110-120 volts AC, 50/60. For 24 volts DC replace "Z" with a "W", e.g., D2778D3900W. For other voltages consult ROSS.

Effective C_v varies with load and pressure drop. Consult ROSS for specifics on your system.

Additional application example circuits available on page 19.

Explosion-Proof Safety Exhaust (Dump) Control Reliable Double Valves Directional Control Valves

APPROVED for use in the following Hazardous Locations – Ex m II T4 and Division 1
Specifications in accordance to CSA certificate: Class I, Division 1, Groups A, B, C and D; Class II, Groups E, F and G; Class III; Class I, Division 2, Groups A, B, C, D.
Specifications in accordance to FM certificate: Explosion-proof Class I, Division 1, Groups A, B, C, D, T4, Ta = 60 °C (encapsulation/explosion-proof Class I, Zone 1, AEx m II T4, Ta = 60 °C; dust-ignition-proof for Class II/III, Division 1, Groups E, F and G, T4, Ta = 60 °C); Nonincendive Class I, Division 2, Groups A, B, C, D, T4, Ta = 60 °C; Suitable for Class II, III, Division 2, Groups E, F, G, T4, Ta = 60 °C
CSA CLASS 2258 02 – process control equipment – for hazardous locations;
FM CLASS 3600, 3611, 3615, 3810 – hazardous (classified) location electrical equipment

DM2® Series C – 3/2 Explosion-Proof Safety Exhaust Double Valves with Dynamic Monitoring and Memory

- Dynamic memory of abnormal function retains lockout condition and this prevents unintentional reset with removal of air or electricity
- Self-contained dynamic monitoring system requires no additional valve monitoring controls
- Electrical reset valve
- Rapid response time to minimize stopping time
- Status Indicator switch for valve condition (ready to run) feedback
- Highly contaminant-tolerant poppet construction
- Sistema library data available.

ISO 13849-1:2006 Category 4 PL e applications

HSM 15022 Sicherheit geprüft tested safety

These valves are not designed for controlling clutch/brake mechanisms on mechanical power presses.

Choose your options (in red) to configure your valve model number.

DM2C	N	A	42	A	2	1	019
Series		Revision Level			Reset Type	Status Indicator	Pilot Type

Thread

BSPP	D
NPT	N

Basic Size	Port Size Inlet	Port Size Outlet	
2	1/4	1/4	20
	3/8	3/8	21
	Valve Only (No Base)		2X
4	1/2	1/2	42
	Valve Only (No Base)		4X
12	1	1	66
	Valve Only (No Base)		6X
30	1½	2	88
	Valve Only (No Base)		8X

Voltage*

24 volts DC	A
120 volts AC, 60 Hz	B

* For other voltages consult ROSS.

Reset Type

Solenoid	2

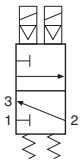
Status Indicator

Yes	1
No	X

Pilot Type

Explosion Proof	019

Basic Size	Inlet Port Size	Cv 1-2	Cv 2-3
2	1/4	1.67	2.61
	3/8	2.17	2.61
4	1/2	3	10
12	1	8.5	20
30	1½	22	64



Accessories and options available, see page 20 thru 22.

27 & 21 Series – 2/2 Explosion-Proof Directional Control Inline Valves

- Poppet construction for near zero leakage & high dirt tolerance
- Pilot can be rotated, giving the ability to change orientation
- Repeatability throughout the life of the valve
- 27 Series - Acetal internals
- 21 Series - Metal, aluminum internals - for low temperature applications.

ATEX Certified valves available.

Choose your options (in red) to configure your valve model number.

	27	71	B	200	2	W
Thread	Series	Function	Revision Level	Body Size / Port Size 1,2	Explosion Proof Series	Voltage* (Solenoid Pilot only)

Thread

BSPP	D
NPT	Leave Blank

Series

21 Low Temperature	21*
27 Standard	27

*Available in 3/8, 3/4, 1¼ Body Size only.

Function

2/2 Normally Closed	71
2/2 Normally Open	72

Body Size	Port Size 1,2	
3/8	1/4	200
	3/8	300
	1/2	401
3/4	1/2	400
	3/4	500
	1	601
1¼	1	600
	1¼	700
	1½	801
2 (27 Series valves only)	1½	800
	2	900
	2½	901

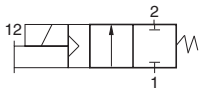
Explosion Proof Series

21 Series Valve	5
27 Series Valve	2

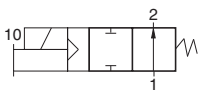
Voltage* (Solenoid Pilot only)

24 volts DC	W
120 volts AC, 60 Hz	Z

* For other voltages consult ROSS.



Normally Closed



Normally Open

Valve Style	Series	Port Size 1, 2	Body Size	Cv NC	Cv NO
Standard	27	1/4	3/8	2.3	2.3
		3/8	3/8	3.8	3.3
		1/2	3/8	4.0	3.5
		1/2	3/4	7.7	6.5
		3/4	3/4	9.0	7.3
		1	3/4	9.0	7.9
		1	1¼	24	21
		1¼	1¼	29	20
		1½	1¼	29	21
		1½	2	49	49
		2	2	57	57
		2½	2	64	72
Low Temperature	21	1/4	3/8	2.3	2.3
		3/8	3/8	3.8	3.3
		1/2	3/8	4.0	3.5
		1/2	3/4	7.7	6.5
		3/4	3/4	9.0	7.3
		1	3/4	9.0	7.9
		1	1¼	24	21
		1¼	1¼	29	20
		1½	1¼	29	21

27 & 21 Series – 3/2 Explosion-Proof Directional Control Inline Valves

CONTROL CATEGORY 1

Valve Style	Series	Port Size		Body Size	C_v			
					NC		NO	
		1, 2	3		1-2	2-3	1-2	2-3
Standard	27	1/4	1/2	3/8	2.5	3.1	2.3	2.7
		3/8	1/2	3/8	3.6	5.3	2.8	3.2
		1/2	1/2	3/8	3.3	5.3	2.8	3.2
		1/2	1	3/4	6.3	9.2	6.3	8.0
		3/4	1	3/4	7.7	11	6.9	7.4
		1	1	3/4	8	12	6.8	7.5
		1	1½	1¼	23	34	17	24
		1¼	1½	1¼	30	32	19	24
		1½	1½	1¼	30	31	19	23
		1½	2½	2	68	70	57	59
		2	2½	2	70	70	58	61
		2½	2½	2	70	71	54	55
Low Temperature	21	1/4	1/2	3/8	2.4	3.4	2.0	2.1
		3/8	1/2	3/8	3.0	5.8	2.3	2.4
		1/2	1/2	3/8	3.0	5.2	2.9	2.8
		1/2	1	3/4	6.6	12	6.5	7.0
		3/4	1	3/4	7.8	13	7.5	7.5
		1	1	3/4	7.5	12	7.7	7.6
		1	1½	1¼	24	40	15	17
		1¼	1½	1¼	29	39	21	23
		1½	1½	1¼	30	38	22	23

- Poppet construction for near zero leakage & high dirt tolerance
- Pilot can be rotated, giving the ability to change orientation
- Repeatability throughout the life of the valve
- 27 Series - Acetal internals
- 21 Series - Metal, aluminum internals - for low temperature applications.

CE CSA C US

ATEX Certified valves available. Ex

Choose your options (in red) to configure your valve model number.

D | 27 | 73 | B | 200 | 2 | W

Thread
- BSPP D
- **NPT Leave Blank**

Series
- 21 Low Temperature 21*
- **27 Standard 27**
- *Available in 3/8, 3/4, 1¼ Body Size only.

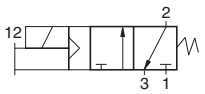
Function
- **3/2 Normally Closed 73**
- 3/2 Normally Open 74

Revision Level

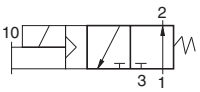
Body Size	Port Size 1,2	
3/8	**1/4**	**200**
	3/8	300
	1/2	401
3/4	1/2	400
	3/4	500
	1	601
1¼	1	600
	1¼	700
	1½	801
2 (27 Series valves only)	1½	800
	2	900
	2½	901

Voltage* (Solenoid Pilot only)
- **24 volts DC W**
- 120 volts AC, 60 Hz Z
- * For other voltages consult ROSS.

Explosion Proof Series
- 21 Series Valve 5
- **27 Series Valve 2**



Normally Closed



Normally Open

27 & 21 Series – 4/2 Explosion-Proof Directional Control Inline Valves

CONTROL CATEGORY 1

Valve Style	Series	Port Size		Body Size	C_v	
		1, 2, 4	3		1-2, 1-4	4-3, 2-3
Standard	27	1/4	1/2	3/8	2.1	2.9
		3/8	1/2	3/8	2.9	4.2
		1/2	1/2	3/8	3.1	4.3
		1/2	1	3/4	5.6	8.1
		3/4	1	3/4	7.0	9.3
		1	1	3/4	7.8	10
		1	1½	1¼	19	26
		1¼	1½	1¼	21	27
		1½	1½	1¼	22	27
Low Temperature	21	1/4	1/2	3/8	2.1	2.2
		3/8	1/2	3/8	2.5	3.1
		1/2	1/2	3/8	2.9	3.8
		1/2	1	3/4	5.7	6.5
		3/4	1	3/4	7.1	8.7
		1	1	3/4	7.7	10
		1	1½	1¼	18	23
		1¼	1½	1¼	20	28
		1½	1½	1¼	21	29

- Poppet construction for near zero leakage & high dirt tolerance
- Pilot can be rotated, giving the ability to change orientation
- Repeatability throughout the life of the valve
- 27 Series - Acetal internals
- 21 Series - Metal, aluminum internals - for low temperature applications.

CE CSA C US

ATEX Certified valves available. Ex

Choose your options (in red) to configure your valve model number.

D | 27 | 76 | B | 200 | 2 | W

Thread
- BSPP D
- **NPT Leave Blank**

Series
- 21 Low Temperature 21*
- **27 Standard 27**

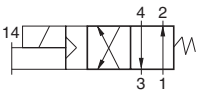
Function
- **4/2 Normally Closed 76**

Revision Level

Body Size	Port Size Inlet	Port Size Outlet	
3/8	**1/4**	**1/2**	**200**
	3/8	1/2	300
	1/2	1/2	401
3/4	1/2	1	400
	3/4	1	500
	1	1	601
1¼	1	1½	600
	1¼	1½	700
	1½	1½	801

Voltage* (Solenoid Pilot only)
- **24 volts DC W**
- 120 volts AC, 60 Hz Z
- * For other voltages consult ROSS.

Series
- 21 Low Temperature 5
- **27 Series 2**



Accessories

- Silencers

Silencers, see page 22.

AIR-FUSE Flow Diffusers – 19 Series

- **Protection from Broken Hose or Plastic Tubing**
  - » For use with only non-corrosive, non-flammable, non-hazardous gases
  - » Automatically reduces flow to minimize hose whip upon sensing a broken hose/tube
  - » Simple installation; Reset by shutting off air supply.

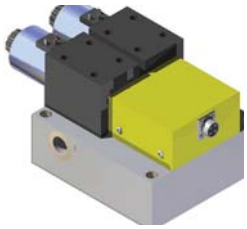
Port Size	Porting Type	Model Number		Shut-off Flow Rate at 100 psi (7 bar) scfm (dm³/s)	Flow at 100 psi (7 bar) ΔP 1 psi (0.07 bar) scfm (dm³/s)
		BSPP Threads	NPT Threads		
1/4	Female-Female	D1969D2002	1969D2002	29.7 (14)	13.8 (8)
3/8	Female-Female	D1969D3002	1969D3002	68.2 (32)	28.6 (14)
1/2	Female-Female	D1969D4002	1969D4002	102.3 (48)	49.2 (23)
3/4	Female-Female	D1969D5002	1969D5002	169.5 (80)	91.1 (43)
1	Female-Female	D1969D6002	1969D6002	271.0 (128)	144 (68)
1½	Female-Female	D1969D8002	1969D8002	568.0 (268)	307 (145)

Safety Clamping Devices

- ROSS CONTROLS® specializes in pneumatic and hydraulic safety solutions.
- When needing rod locks, rod brakes or safety catchers ROSS CONTROLS® can assist you in finding the optimal solution for every application.

For more information consult ROSS®.

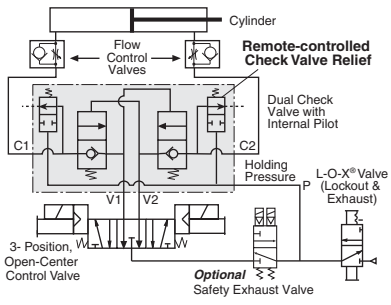
Control Reliable Hydraulic Double Valves



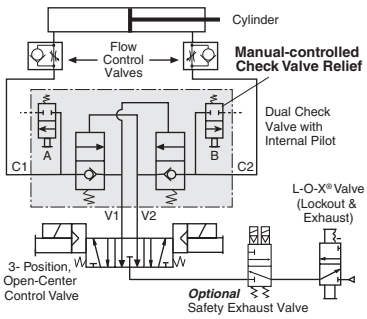
- Port Size SAE12, 16, and 20
- Redundant valve elements
- The shifting of each valving element is monitored by its own safety switch
- Applications: Bending Machines, Trimming Machines, Cutting, Forming, Piercing Machines
- Special Purpose Hydraulic Applications

For more information consult ROSS®.

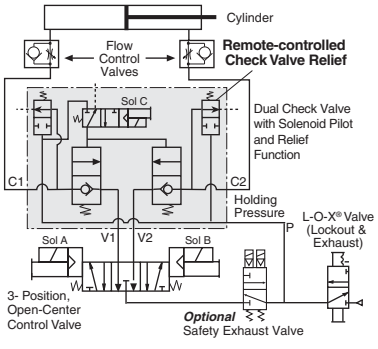
Additional application example circuits for Load Holding, Pilot Operated Check Valves



Dual, with Remote Trapped Pressure Relief



Dual, with Manual Trapped Pressure Relief



Dual, Solenoid Pilot Controlled, with Remote Trapped Pressure Relief

	Solenoid Connector Type	Kit Number	Description	Connector Type	Number of Cables	Length meters (feet)
Kits for M35 Series Valves	M12 System Cables Connector - one end	2644B77	Cords with female connector on one end and flying leads on the opposite end.	5-pin, straight A-coded	2	5 (16.4)
	M12 System Cables Connector both ends	2645B77	Cords with female connector on one end and male, connector on the opposite end.	5-pin, straight A-coded	2	5 (16.4)

	Solenoid Connector Type	Kit Number	Length meters (feet)
Kits for DM[1] & CrossMirror® 77 Series Valves	EN 175301-803 Form A	2243H77	5 (16.4)
		2244H77	10 (32.8)
	M12	2245H77	5 (16.4)
		2246H77	10 (32.8)

These kits include 2 cables with either EN or M12 connectors for the solenoids. All cables include cord grips.

Status Indicator kit ordered separately.

	Solenoid Connector Type	Kit Number	Length meters (feet)
Status Indicator Kits for DM[1] & CrossMirror® 77 Series Valves	EN 175301-803 Form A	2247H77	5 (16.4)
		2248H77	10 (32.8)
	M12	2666H77*	5 (16.4)
		2667H77*	10 (32.8)
	* Available for DM[1] Series valves only.		

Status Indicator kits include one cable with EN or M12 connector and a cord grip.

	Solenoid Connector Type	Kit Number*			Length meters (feet)
		Connector without Light	Lighted Connector		
			24 Volts DC	120 Volts AC	
Kits for DM[2]® Series Valves & CrossMirror® CM Series Size 2 Valves	EN 175301-803 Form A	2283H77	2532H77-W	2532H77-Z	5 (16.4)
		2284H77	2533H77-W	2533H77-Z	10 (32.8)
	M12	2288H77**	–	–	5 (16.4)
		2289H77**	–	–	10 (32.8)
	* Each cable has one connector. **Coil includes light.				

These kits include 1 cable for the status indicator, and 3 cables with connector plus a cord grip for each.

	Connector Type	Kit Number* Lighted Connector	Description	Length meters (feet)
Kits for RSe Series Valves	EN 175301-803 Form C (solenoids) M8 (sensors)	2657B77	These kits include 2 cables for the sensors (M8), and 2 cables (EN 175301-803 Form C) with connector plus a cord grip for each.	2 (6.5)
	* Each cable has one connector.			

	Solenoid Connector Type	Kit Number	Description	Connector Type	Number of Cables	Length meters (feet)
Kits for CrossCheck™ CC4 Series Valves	M12 System Cables Connector - one end	2642B77	Two cords with female , connector on one end and flying leads on the opposite end, and one cord with male connector on one end and flying leads on the opposite end.	5-pin, straight, A-coded	3	5 (16.4)

Wiring Kits with J-Box

Connector Types	Kit Number*	Length meters (feet)
M12 - EN	2249H77	1 (3.3)
M12 - M12	2250H77	1 (3.3)
*24 volts DC only.		

A J-Box is a junction box with a 10-pin MINI connector for connecting to the user's control system and (4) 5-pin M12 ports for connecting to the 3 solenoids and the status indicator on the DM[2]® Series valve. The J-Box kits include the J-Box and (4) 1-meter cables for connecting to the valve. These cables have a connector on each end. The status indicator cable and the (3) solenoid cables have an M12 connector on one end and a EN connector on the other end (M12-EN). Valves are available with EN or M12 type solenoid connections. Kits for valves with M12 type solenoid connection have cables with an M12 connector on each end (M12-M12).

10 PIN MINI Cable

Kit Number	Length meters (feet)
2253H77	3.66 (12)
2254H77	6.1 (20)
2255H77	9.1 (30)
2256H77	15.2 (50)

These cables have a 10-pin MINI connector for connecting the J-Box kits above to the user's control system. Kits include one cable with connector and cord grip. Cable conductors are 18-gauge wire.

Outlet Port Pressure Monitoring Wiring Kit

Kit Number	Length meters (feet)
2251H77	1 (3.3)

For use with DM[1] & DM[2]® Series valves, additional monitoring of downstream pressure can be accomplished by installing a pressure switch in the outlet port that is provided on the DM valve. The Outlet Port Pressure Monitoring kit can be used with one of the J-Box kits above to split one of the M12 ports on the J-Box so that a pressure switch can be wired in as well. These kits consist of one port splitter (a Tee with three M12 connectors) and one M12-EN cable (1 meter).

Electrical Connectors

Connection	Electrical Connector Form	Electrical Connector Type	Cord Length meters (feet)	Cord Diameter	Model Number		
					Without Light	Lighted Connector	
						24 Volts DC	120 Volts AC
Solenoid	EN 175301-803 Form C	Prewired Connector	3 (10)	8-mm	2449K77	2450K77-W	2450K77-Z
		Connector Only	–	–	2452K77	2453K77-W	2453K77-Z
	EN 175301-803 Form A	Prewired Connector (18 gauge)	2 (6½)	6-mm	721K77	720K77-W	720K77-Z
		Prewired Connector (18 gauge)	2 (6½)	10-mm	371K77	383K77-W	383K77-Z
		Connector for threaded conduit (1/2 inch electrical conduit fittings)	–	–	723K77	724K77-W	724K77-Z
		Connector Only	–	–	937K87	936K87-W	936K87-Z
Feedback Sensor	M8 Connector (sensing)	Prewired Connector	2 (6.5)	–	249L74	–	–
CAUTIONS: Do not use electrical connectors with surge suppressors, as this may increase valve response time when de-actuating the solenoids.							

Indicator Light Kit for Pacer Style Pilot	Kit Number	
	24 volts DC	110-120 volts AC 50-60 Hz
	862K87-W	862K87-Z

Energy Release Verification Options

May be installed on all valves with pressure sensing port, L-O-X® and L-O-X® with EEZ-ON® function, DM¹, DM²® & M DM²® Series, CrossMirror® 77 & CM Series, and SV27 & SV27 PO Check.

- **Pressure Switches (Electrical)**
  - » Provides a means to verify the release of downstream pressure to next obstruction
  - » Factory preset, 5 psi (0.3 bar) - falling.

- **Pop-Up (Visual) Indicator**
  - » Provides a means to verify the release of downstream pressure to next obstruction.
- **Redundant Downstream Feedback Switch**
  - » Provides a redundant means to verify the release of downstream pressure to next obstruction
  - » May be installed downstream on all double valves, and valves with sensing
  - » Factory preset, 5 psi (0.3 bar) - falling.

Pressure Switches		
Connection Type	Model Number	Threads
EN 175301-803 Form A	586A86	1/8 NPT
M12	1153A30	1/8 NPT

POP-UP Indicator	
Model Number	Port Threads
988A30	1/8 NPT

Redundant Downstream Feedback Switch	
Model Number	Port Threads
RC026-13	3/8 NPT

Energy Release Verification Options for Stainless Steel Applications

- **Pressure Switches (Electrical)**
  - » Provides a means to verify the release of downstream pressure to next obstruction
  - » 316 Stainless Steel Body, Internals and Springs, Nitrile Seal
  - » DPDT (Double-Pole Double-Throw) Pressure Switch
  - » Factory preset, 5 psi (0.3 bar) - falling.

- **Pop-Up (Visual) Indicator**
  - » Provides a means to verify the release of downstream pressure to next obstruction
  - » 316 Stainless Steel Body, Internals and Springs, Nitrile Seal
  - » Visual Indicator Piston – acetal
  - » Visual Indicator Assembly – acetal with acrylic lens.

Pressure Switch	
Model Number	Threads
1162A30	1/8 NPT

POP-UP Indicator	
Model Number	Port Threads
1155H30	1/8 NPT

Mounting Accessories for Air Entry Packages

- Mounting Brackets & Clamp for Module Connections
- Extra Port Blocks
- Female & Male End Ports.

Mounting Brackets & Clamp for Module Connections	
Description	Model Number
Bracket and Screw	R-A118-103
Clamp	R-A118-105
Bracket, screw, and Clamp	R-118-105M

Port Block and End Ports	Port Size	Model Number	
		NPT Threads	BSPP Threads
Extra Port Blocks	1/2	R-118-106-4	R-118-106-4W
Female End Ports	1/2	R-118-100-4	R-118-100-4W
	3/4	R-118-100-6	R-118-100-6W
Male End Ports	1/2	R-118-109-4F	R-118-109-4FW
	3/4	R-118-109-6F	R-118-109-6FW

Model Number	356A30

Multiple Lockout Device

- **Allows use of multiple lockout devices on a single energy isolation device**
  - » For use with any ROSS model valve with L-O-X® capability.

Port Size	Model Number*	Pressure Range psig (bar)
1/8	5400A1002	0-160 (0-11)

* Center back mounting; male pipe threads.

Pressure Gauge

- Center back mounting
- Male pipe threads.

Silencers/Reclassifiers

Silencers

Port Size	Thread Type	Model Number		Avg. C_v
		BSPT Threads	NPT Threads	
1/8	Male	D5500A1003	5500A1003	1.2
1/4	Male	D5500A2003	5500A2003	2.1
3/8	Male	D5500A3013	5500A3013	2.7
		D5500A3003	5500A3003	4.3
1/2	Male	D5500A4003	5500A4003	4.7
3/4	Male	D5500A5013	5500A5013	5.1
		D5500A5003	5500A5003	11.5
1	Male	D5500A6003	5500A6003	14.6
1¼	Male	D5500A7013	5500A7013	16.4
	Female	D5500A7001	5500A7001	24
1½	Female	D5500A8001	5500A8001	29.9
2	Female	D5500A9001	5500A9001	34.2
2½	Female	D5500A9002	5500A9002	103.7

- Reduces exhaust noise
- Diffuses exhausting air
- Back pressure, minimal
- Typical impact noise reduction is in the 20-25 dB range
- Pressure Range: 0 to 290 psig (0 to 20 bar) maximum.
- Flow Media: Filtered air.

Port size 1/8 thru 2

Port size 2½

Stainless Steel Silencers

Port Size	Thread Type	Model Number		Avg. C_v
		BSPT Threads	NPT Threads	
1/4	Male	D5500B2004	5500B2004	1.44
1/2	Male	D5500B4004	5500B4004	3.01
1	Male	D5500B6004	5500B6004	10.41
2	Male	D5500A9004	5500A9004	28.11

- Constructed for corrosive situations
- For continuous heavy-duty use
- Recommended for air exhaust applications for pressures up to 125 psig (8.6 bar)
- Pressure Range: 0 to 150 psig (0 to 10.3 bar) maximum.
- Flow Media: Filtered air; 5-micron recommended.

Stainless Steel Silencers, Sintered Element

Port Size	Thread Type	Model Number		Avg. C_v
		BSP Threads	NPT Threads	
1/4	Male	D5500A2005	5500A2005	1.5
1/2	Male	D5500A4005	5500A4005	3.5
1	Male	D5500A6005	5500A6005	5.7

- 316 Stainless Steel sintered element silencers used to protect ports open to the atmosphere.
- Recommended for air exhaust applications for pressures up to 174 psig (12 bar)
- Pressure Range: 0 to 174 psig (0 to 12 bar) maximum.
- Flow Media: Filtered air; 5-micron recommended
- Seals: Nitrile.

High-Flow, High-Reduction Silencers

Valve Model	Basic Size	Kit Number*		Flow scfm
		BSPT Threads	NPT Threads	
DM Series C	4	2329H77	2324H77	800 (378)
	8	2330H77	2325H77	800 (378)
	12	2331H77	2326H77	2080 (982)
	30	2332H77	2327H77	7200 (3398)

* Kits include all plumbing required for installation.

- Reduces the Exponentially Perceived Noise (EPNdB)
- Improves equipment performance
- 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.

Silencer/Reclassifiers

Port Size	Model Number		Avg. C_v
	BSPT Threads	NPT Threads	
1/2	C5055B4009	5055B4009	5.4
3/4	C5055B5009	5055B5009	7.4
1	C5055B6009	5055B6009	7.4

- Reduces exhaust noise at exhaust ports of valves
- Captures 90% of exhausted lubricants
- Use on air tools, valve with piped exhaust cylinder and air motor applications, or any system that requires air line lubrication
- Both a drain cock and a 1/8 tube fitting are supplied for the manual or constant draining of accumulated liquids
- Sound attenuation & back pressure data available, see FRL Catalog for more information.

CAUTIONS and WARNINGS

PRE-INSTALLATION or SERVICE

1. Before servicing a valve or other pneumatic component, be sure that all sources of energy are turned off, the entire pneumatic system is shut off and exhausted, and all power sources are locked out (ref: OSHA 1910.147, EN 1037).

2. All ROSS products, including service kits and parts, should be installed and/or serviced only by persons having training and experience with pneumatic equipment. Because any installation can be tampered with or need servicing after installation, persons responsible for the safety of others or the care of equipment must check every installation on a regular basis and perform all necessary maintenance.

3. All applicable instructions should be read and complied with before using any fluid power system in order 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 location listed on the cover of this document.

4. Each ROSS product should be used within its specification limits. In addition, use only ROSS parts to repair ROSS products.

WARNING: Failure to follow these directions can adversely affect the performance of the product or result in the potential for human injury or damage to property.

FILTRATION and LUBRICATION

5. 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. ROSS recommends a filter with a 5-micron rating for normal applications.

6. All standard ROSS filters and lubricators with polycarbonate plastic bowls are designed for compressed air applications only. Do not fail to 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, hazardous leakage, and the potential for human injury or damage to property. Immediately replace a crazed, cracked, or deteriorated bowl. When bowl gets dirty, replace it or wipe it with a clean dry cloth.

7. Only use lubricants which are compatible with materials used in the valves and other components in the system. Normally, compatible lubricants are petroleum based 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 human injury, and/or damage to property.

AVOID INTAKE/EXHAUST RESTRICTION

8. Do not restrict the air flow in the supply line. To do so could reduce the pressure of the supply air below the minimum requirements for the valve and thereby cause erratic action.

9. 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.

WARNING: ROSS expressly disclaims all warranties and responsibility for any unsatisfactory performance or injuries caused by the use of the wrong type, wrong size, or an inadequately maintained silencer installed with a ROSS product.

POWER PRESSES

10. 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.

ENERGY ISOLATION/EMERGENCY STOP

11. Per specifications and regulations, ROSS **L-O-X®** and **L-O-X®** with **EEZ-ON®** operation products are defined as energy isolation devices, NOT AS EMERGENCY STOP DEVICES.

STANDARD WARRANTY

All products sold by ROSS CONTROLS are warranted for a one-year period [with the exception of all Filters, Regulators and Lubricators ("FRLs") which are warranted for a period of seven years] from the date of purchase to be free of defects in material and workmanship. ROSS' obligation under this warranty is limited to repair or replacement of the product or refund of the purchase price paid solely at the discretion of ROSS and provided such product is returned to ROSS freight prepaid and upon examination by ROSS is found to be defective. This warranty becomes void in the event that product has been subject to misuse, misapplication, improper maintenance, modification or tampering.

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