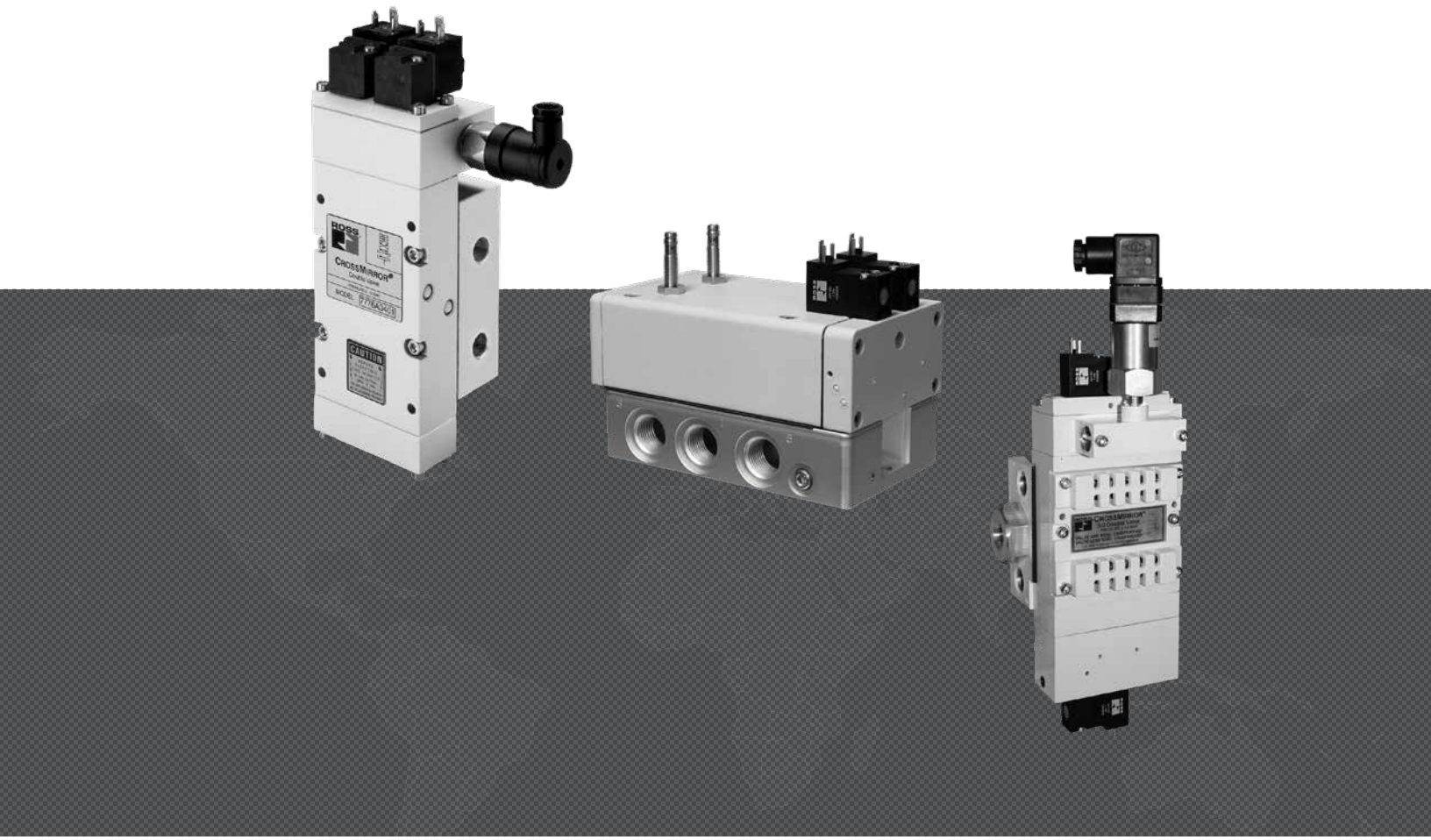
Safe Cylinder Return
Control Reliable Monitored Valves



ROSS CONTROLS

5/2 RSe Series – KEY FEATURES

- 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
- External pilot supply port is a standard feature
- Base-mounting design

5/2 CrossMirror® Series – KEY FEATURES

- Can be used as 3/2 Normally Closed or 3/2 Normally Open valve function by plugging the unused outlet port
- Self-contained dynamic monitoring system; no additional monitoring required
- Valve fault results in a lockout condition and prevents unintentional reset with removal of air or electricity
- Reset can be electrical solenoid or remote pneumatic signal
- Status indication switch (ready-to-run) to inform machine controller of valve condition
- Base mounted, stainless steel spool valve construction
- Manifoldable for multi valve applications
- Includes non-clogging safety mufflers; for applications requiring ported exhaust, consult ROSS

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

Double Valves for External Monitoring

CrossMirror® Double Valves with Dedicated Reset

CrossMirror® Double Valves with Automatic Reset

VALVE TYPE	VALVE SERIES	OPERATION		AVAILABLE PORT SIZES					MAX. FLOW Cv					RESET		Page
									Port Size							
		AIR PILOT	SOLENOID	1/8	1/4	3/8	1/2	3/4	1/8	1/4	3/8	1/2	3/4	REMOTE	SOLENOID	
DOUBLE VALVES Designed for External Monitoring																
with Proximity Sensors	**RSe**		■	■	■		■		0.85	0.98		2.07		■		A4.3 - A4.4
DOUBLE VALVES with Dedicated Reset																
with Pressure Switch	**CM**		■		■	■	■			1.1	1.1	3.9		■	■	A4.5 - A4.8
without Pressure Switch	**CM**		■		■	■	■			1.1	1.1	3.9		■	■	
Components for MANIFOLD ASSEMBLIES - Solenoid Pilot Controlled																
Valves, Manifold Bases and End Stations for Manifold Assemblies																A4.8
with Pressure Switch	**CM**	■			■	■	■			1.1	1.1	3.9		■		A4.9 - A4.11
without Pressure Switch	**CM**	■			■	■	■			1.1	1.1	3.9		■		
Components for MANIFOLD ASSEMBLIES - Pressure Controlled																
Valves, Manifold Bases and End Stations for Manifold Assemblies																A4.11
DOUBLE VALVES with Automatic Reset																
with Pressure Switch	**77**		■			■	■	■			2.8	7.2	7.2	■	■	A4.12 - A4.13
without Pressure Switch	**77**		■			■	■	■			2.8	7.2	7.2	■	■	
PRESSURE CONTROLLED																
with Pressure Switch	**77**	■				■	■	■			2.8	7.2	7.2	■		A4.14 - A4.15
without Pressure Switch	**77**	■				■	■	■			2.8	7.2	7.2	■		

5/2 Redundant Double Valve – Sub-base Mounted

SIL 3 Functional Safe
Cat. 4 PL e
DGUV Test HSM xxxxxx Sicherheit geprüft tested safety
CE
(Certifications pending)

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

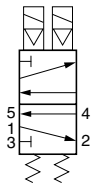
RSe	6	E	D	B	10	A	3	1	P
Series	Type/Function: 5/2	External Monitoring	Thread: G D, NPT N	Revision Level	Base Port Size	Voltage: 24 volts DC	Automatic Reset	Sensor Feedback	Sensor: Sensor Output PNP

Base Port Size

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

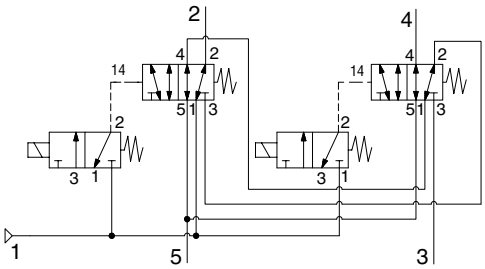
Port Size	C_v				Weight lb (Kg)
	1-2	1-4	2-3	4-5	
1/8	0.85	0.58	0.49	0.75	2.9 (1.3)
1/4	0.98	0.79	0.69	0.85	3.7 (1.7)
1/2	2.07	1.54	1.51	1.81	6.6 (2.99)

Simplified Schematic



The 5/2 RSe Series valve is designed to control the direction of air flow into and out of a double-acting cylinder or other pneumatic actuator in order to drive the cylinder forward or backward to suit the requirements of the machine operation. However, the RSe Series does this with the same level of control expected of the machine's/system's safety circuit. The safety function of the RSe Series valve is to return the cylinder/actuator to its home "safe" position whenever a fault occurs within the valve. Such a monitoring system must be capable of inhibiting the operation of the valve.

The RSe Series valves are designed for external monitoring for safe, redundant operation of the valves. The RSe Series valves are constructed of redundant, spool type valves, and have an overall function of a single solenoid pilot-operated, spring return valve. Each single valve in the RSe Series is equipped with a PNP proximity sensor. Monitoring both of these sensors on each actuation and de-actuation of the RSe Series valve provides a diagnostic coverage of 99%. Monitoring of these sensors is to be done by an external monitoring system.



An Integration Guide for the RSe Series Valves is available from ROSS to provide information such as operation & monitoring, and validation test procedure for valve operation and external monitoring logic.

STANDARD SPECIFICATIONS (for valves on this page):

Construction Design	Spool and Sleeve
Actuation	Solenoid pilot operated with air assisted spring return One solenoid per valve element (2 total) – both to be operated synchronously
Mounting	Type: Base Orientation: Any, preferably vertical
Solenoids	Version as per VDE 0580. Rated for continuous duty
Enclosure Rating	DIN 400 50 IP 65
Electrical Connection	Connector Socket according to EN 175301-803 Form C
Voltage	24 volts DC
Power Consumption (each solenoid)	1.5 watts on DC
Proximity Sensors (2 per valve)	PNP
Current Consumption (each sensor)	<23mA
Temperature	Ambient/Media: 40° to 120°F (4° to 50°C)

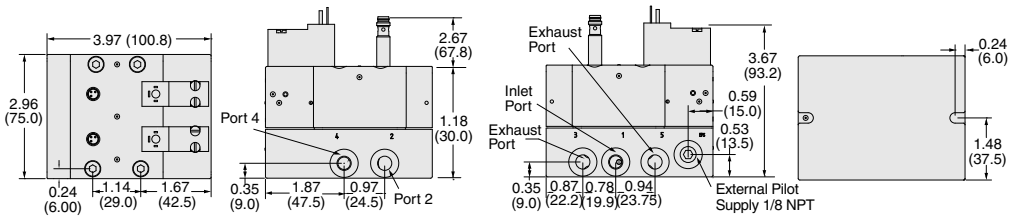
Flow Media	Compressed, filtered air according to ISO 8573-1 Class 7:4:4
Pilot Supply	Internal or External
Operating Pressure	With Internal Pilot Supply: 43 to 145 psig (3 to 10 bar) With External Pilot Supply: 0 to 145 psig (0 to 10 bar) Pilot Supply - *When external pilot supply, pressure must be equal to or greater than inlet pressure.*
Monitoring	Dynamic, cyclical, external with customer supplied equipment. Monitoring should check state of both valve position sensors with any and all changes in state of valve control signals.
Minimum Operation Frequency	Once per month, to ensure proper function
Maximum Recommended Allowable Discordance Time:	250 msec
Construction Material	**Valve Body:** Cast Aluminum **Spool:** Stainless Steel **Seals:** Buna-N
Pending Functional Safety Data	

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

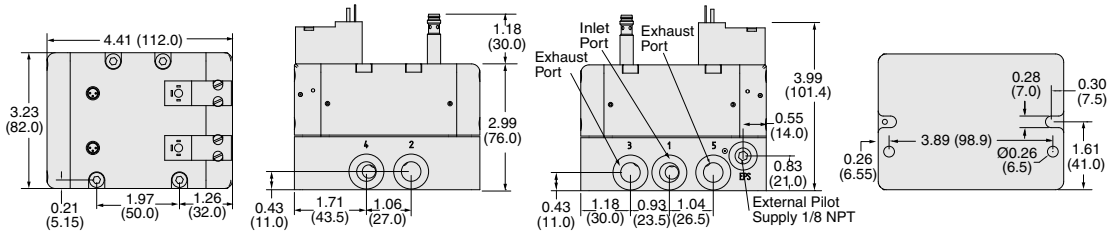
IMPORTANT NOTE: Please read carefully and thoroughly all of the **CAUTIONS, WARNINGS** on the inside back cover.

Valve Dimensions – inches (mm)

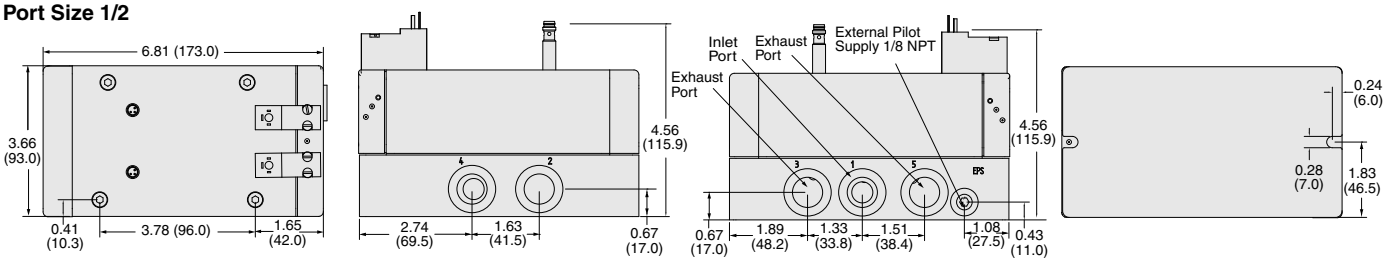
Port Size 1/8



Port Size 1/4



Port Size 1/2



Accessories & Options

Silencers

Port Size	Thread Type	Model Number		Avg. C_v	Dimensions inches (mm)		Weight lb (kg)
		NPT Threads	R/Rp Threads		Width	Length	
1/8	Male	5500A1003	D5500A1003	1.2	0.9 (21)	2.0 (51)	0.1 (0.1)
1/4	Male	5500A2003	D5500A2003	2.1	0.9 (21)	2.2 (55)	0.1 (0.1)
1/2	Male	5500A4003	D5500A4003	4.7	1.3 (32)	3.6 (91)	0.2 (0.1)

Pressure Range: 0 to 290 psig (0 to 20 bar) maximum. **Flow Media:** Filtered air.

Electrical Connectors

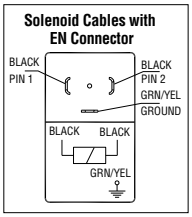
Connection	Electrical Connector Form	Electrical Connector Type	Cord Length meters (feet)	Cord Diameter	Model Number	
					Without Light	Lighted Connector 24 Volts DC
Solenoid	DIN EN 175301-803 Form C	Prewired Connector (18 gauge)	3 (10)	8-mm	2449K77	2450K77-W
	DIN 43650 Form C	Connector Only	–	–	2452K77	2453K77-W
Feedback Sensor	M8 Connector (sensing)	Prewired Connector	2 (6.5)	–	249L74	–

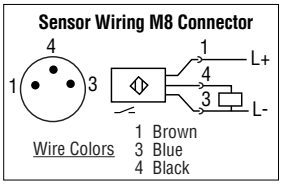
CAUTIONS: Do not use electrical connectors with surge suppressors, as this may increase valve response time when de-actuating the solenoids.

Preassembled Wiring Kits

Connector Type	Model Number* Lighted Connector	Length meters (feet)
EN 175301-803 Form C (solenoids) M8 (sensors)	2657B77	2 (6.5)

* Each cable has one connector. This kit includes 2 cables for the sensors (M8), and 2 cables (EN 175301-803 Form C) with connector plus a cord grip for each.





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

Valve and Base Assembly

5 Ports, 4-Way 2-Position Valve, Pressure Return

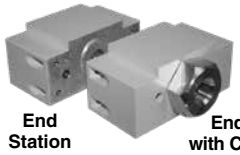
Port Size	Basic Size	Status Indicator Switch	With Remote Reset		With Solenoid Reset		C_v				Weight lb (kg)
			Valve Model Number#*		Valve Model Number#*						
1, 2, 4			NPT Threads	G Threads	NPT Threads	G Threads	1-2	1-4	2-3	4-5	
1/4	0	With#	CM26PNA00A11	CM26PDA00A11	CM26PNA00A21	CM26PDA00A21	0.8	0.6	0.5	1.1	5.85 (2.7)
		Without	CM26PNA00A1X	CM26PDA00A1X	CM26PNA00A2X	CM26PDA00A2X	0.8	0.6	0.5	1.1	5.30 (2.4)
3/8	0	With#	CM26PNA01A11	CM26PDA01A11	CM26PNA01A21	CM26PDA01A21	0.8	0.6	0.5	1.1	5.75 (2.6)
		Without	CM26PNA01A1X	CM26PDA01A1X	CM26PNA01A2X	CM26PDA01A2X	0.8	0.6	0.5	1.1	5.20 (2.4)
1/2	2	With#	CM26PNA22A11	CM26PDA22A11	CM26PNA22A21	CM26PDA22A21	3	2.5	2	3.9	14.45 (6.6)
		Without	CM26PNA22A1X	CM26PDA22A1X	CM26PNA22A2X	CM26PDA22A2X	3	2.5	2	3.9	13.80 (6.3)

 # Voltage: A=24 VDC; B=110 VAC, 120 VAC; e.g., CM26PNA00B1X.
* Valve includes pressure switch status indicator with DIN type electrical connection, for pressure switch status indicator with M12 type electrical connection consult ROSS.

ISO 13849-1
CAT 4, PL e

Valves, Manifold Bases, and End Stations for Manifold Assemblies

In addition to the manifold, an end station kit with a check valve must be ordered for each assembly. The number of manifolds with a single supply inlet will be limited to the pressure and flow rate of the system. Too many manifolds may result in too large of an internal pressure drop resulting in valve faults. The manifold end station kit with dual inlet check will allow the manifold to be supplied with air from both ends of the assembly.



End Station

Manifold Base

End Station with Check Valve

Port Size		Basic Size	Valve without Sub-Base			Manifold Base Model Number		Manifold End Station w/ Check Valve Kit Number		Dual Supply Manifold End Station w/ Check Valves Kit Number	
			Status Indicator Switch	Model Number							
1	2, 4			With Remote Reset	With Solenoid Reset	NPT Threads	G Threads	NPT Threads	G Threads	NPT Threads	G Threads
1/4	1/4	0	With*	CM26PXA0XA11	CM26PXA0XA21	Y1951D91	YD1951D91	699K86	D699K86	701K86	D701K86
			Without	CM26PXA0XA1X	CM26PXA0XA2X	Y1951D91	YD1951D91	699K86	D699K86	701K86	D701K86
3/8	3/8	0	With*	CM26PXA0XA11	CM26PXA0XA21	Y1949D91	YD1949D91	698K86	D698K86	700K86	D700K86
			Without	CM26PXA0XA1X	CM26PXA0XA2X	Y1949D91	YD1949D91	698K86	D698K86	700K86	D700K86
1/2	1/2	2	With*	CM26PXA2XA11	CM26PXA2XA21	Y1955D91	YD1955D91	702K86	D702K86	704K86	D704K86
			Without	CM26PXA2XA1X	CM26PXA2XA2X	Y1955D91	YD1955D91	702K86	D702K86	704K86	D704K86

 # Voltage: A=24 VDC; B=110 VAC, 120 VAC; e.g., CM26PXA0XB1X. For other voltages consult ROSS.* Valve includes pressure switch status indicator with DIN type electrical connection, for pressure switch status indicator with M12 type electrical connection consult ROSS.

Explosion proof solenoid pilot available, for more information consult ROSS.

STANDARD SPECIFICATIONS (for valves on this page):

Construction Design	Double Spool and Sleeve
Mounting Type	Base
Solenoids	According to VDE 0580. Two solenoids, rated for continuous duty
Voltage	24 volts DC; 110 volts AC, 50 Hz; 120 volts AC, 60 Hz
Power Consumption (each solenoid)	**Size 0:** 24 volts DC: 1.5 watts on DC; 110 volts AC, 50 Hz/120 volts AC, 60 Hz: 1.7 watts; 120 volts AC, 60 Hz: 5.0 VA **Size 2:** 24 volts DC; 110 volts AC, 50 Hz; 120 volts AC, 50/60 Hz 5.8 watts nominal on AC and DC, 6.5 watts maximum on AC and DC
Enclosure Rating	DIN 400 50 IP 65
Electrical Connection	**Size 0:** Connector socket according to EN 175301-803 Form C **Size 2:** Connector socket according to EN 175301-803 Form A
Temperature	**Ambient:** 40° to 122°F (4° to 50°C) **Media:** 40° to 175°F (4° to 80°C)
Flow Media	Filtered air
Inlet Pressure	40 to 150 psig (3 to 10 bar)
Pressure Switch (Status Indicator) Rating	5 amps at 250 volts AC, or 5 amps at 30 volts DC

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.
Solenoid Reset	Units with solenoid reset include a 3/2 solenoid valve. Energize this solenoid momentarily to reset valve after lock-out condition occurs
Remote Reset	Remote signal to be supplied by customer's 3/2 valve (connect remote signal line to remote RESET port in valve). Apply signal momentarily to reset valve after fault condition occurs.
NOTE: Main solenoids must be off when performing reset procedure.	
Construction Material	**Valve Body:** Cast Aluminum **Spool:** Stainless Steel **Seals:** Buna-N
Functional Safety Data: Category 4, PL e; B_{10D}: 20,000,000; PFH_D: 7.71x10^{-9}; $MTTF_D$: 301.9 (n_{op}: 662400) **Certifications:** CE Marked for applicable directives, DGUV Test **Vibration/Impact Resistance:** Tested to BS EN 60068-2-27	
Conformity	ISO 13849-1

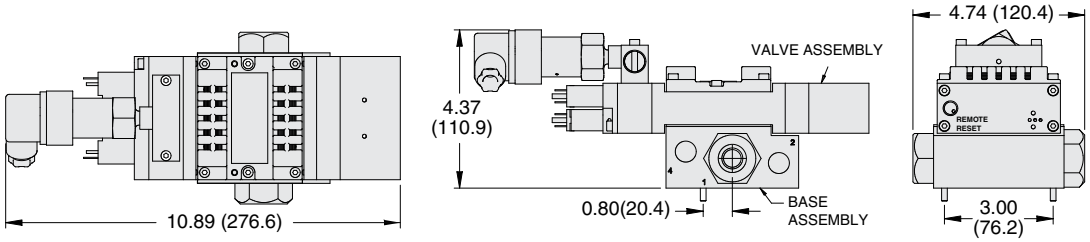
Meets Standards EN13736 and ANSI B11.2, Safety requirements for Pneumatic Cylinder Presses and other hazardous pneumatic cylinder applications.

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

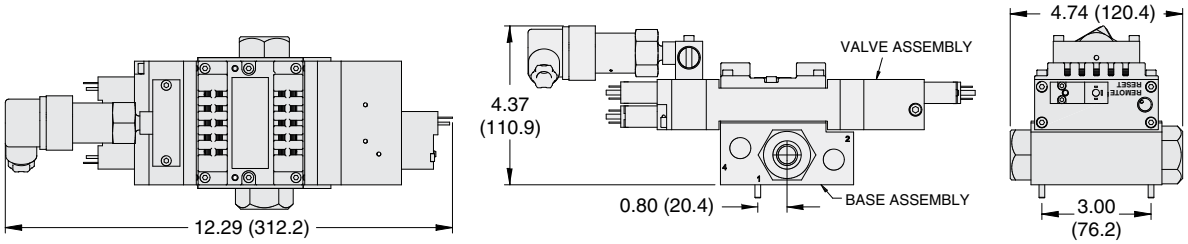
IMPORTANT NOTE: Please read carefully and thoroughly all of the **CAUTIONS, WARNINGS** on the inside back cover.

Valve Dimensions – inches (mm)

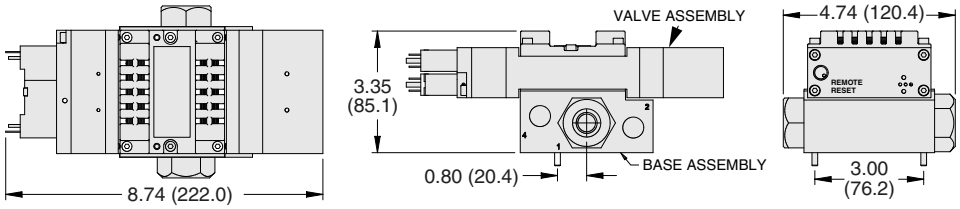
Basic Size 0 - Valve and base assembly, with remote reset and with status indicator switch



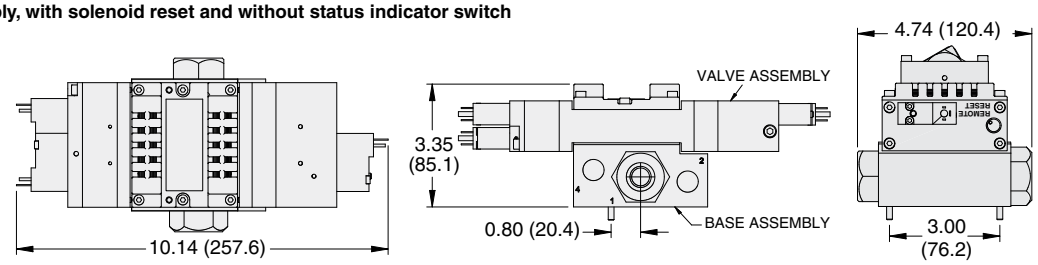
Basic Size 0 - Valve and base assembly, with solenoid reset and with status indicator switch



Basic Size 0 - Valve and base assembly, with remote reset and without status indicator switch

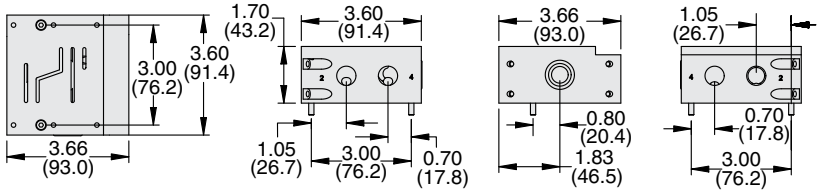


Basic Size 0 - Valve and base assembly, with solenoid reset and without status indicator switch

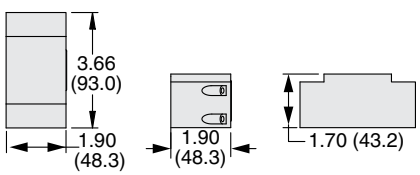


Dimensions – inches (mm)

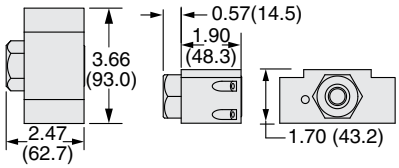
Manifold Base for Basic Size 0



End Station for Basic Size 0

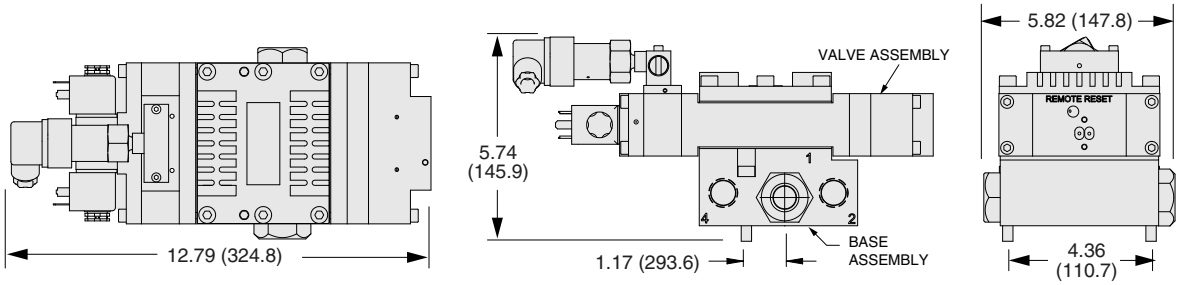


End Station with Check Valve for Basic Size 0

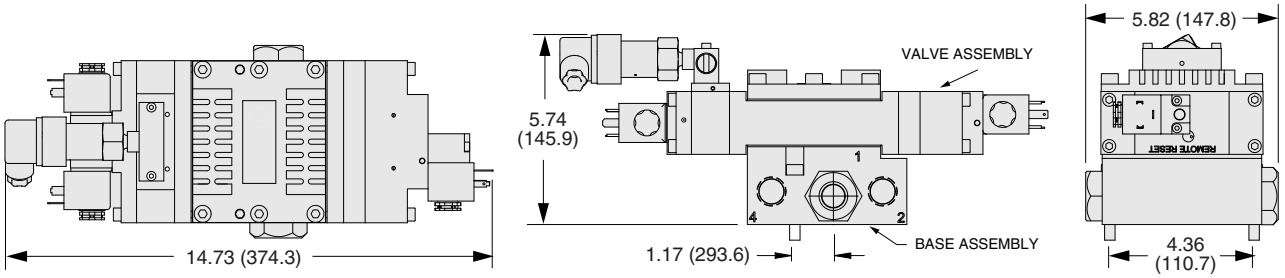


Valve Dimensions – inches (mm)

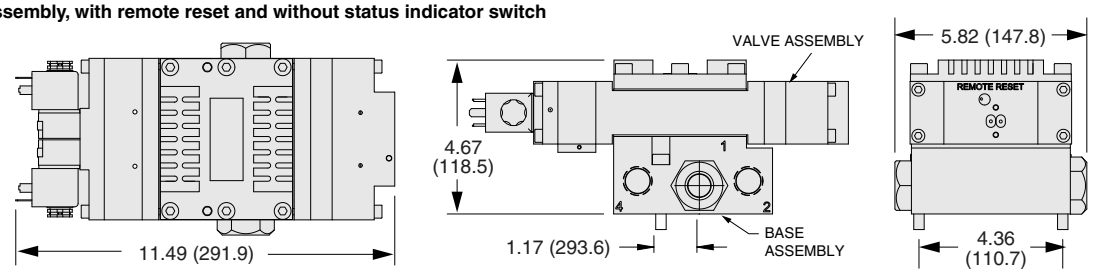
Basic Size 2 - Valve and base assembly, with remote reset and with status indicator switch



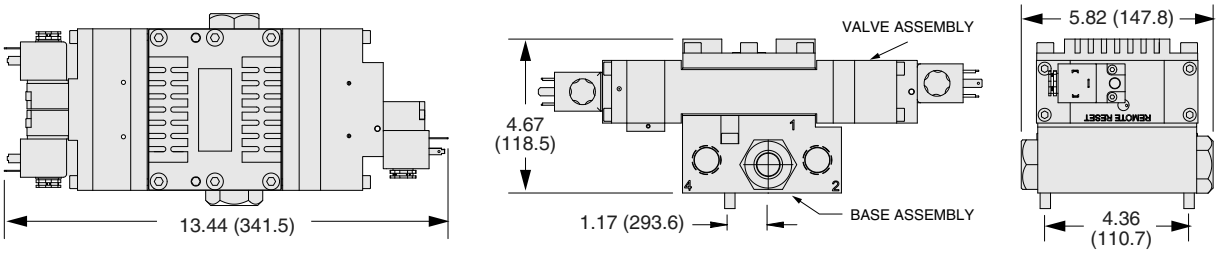
Basic Size 2 - Valve and base assembly, with solenoid reset and with status indicator switch



Basic Size 2 - Valve and base assembly, with remote reset and without status indicator switch

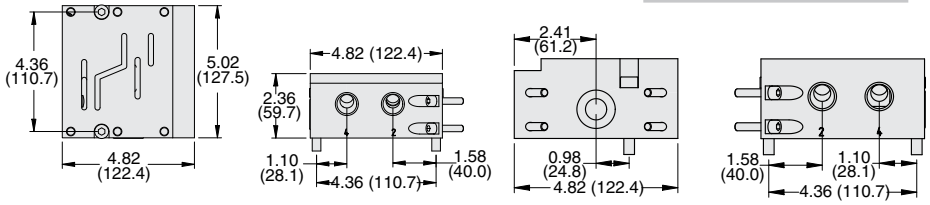


Basic Size 2 - Valve and base assembly, with solenoid reset and without status indicator switch

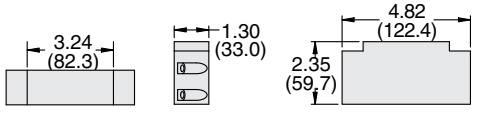


Dimensions – inches (mm)

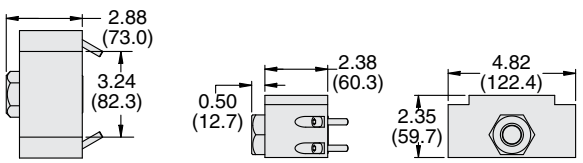
Manifold Base for Basic Size 2



End Station for Basic Size 2



End Station with Check Valve for Basic Size 2

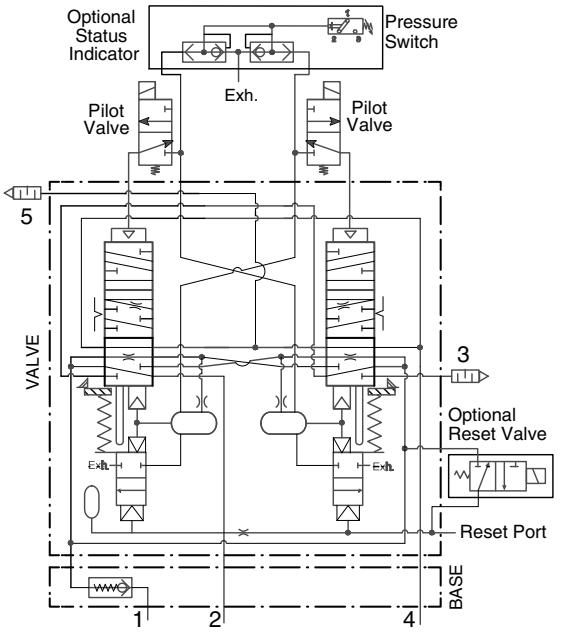


Normal Operation: The valve is operated by energizing both pilot solenoids simultaneously. This causes both main valve elements to be actuated so that air from inlet port 1 flows to outlet port 4, but not to port 2. Air downstream of port 2 is exhausted through port 3.
When the solenoids are de-energized, both valve elements are de-actuated, and air then flows from inlet port 1 to outlet port 2, but no longer to outlet port 4. Air downstream of port 4 is exhausted through port 5. On first operation, or after repair, the pilot valve supply circuit and inherent monitoring elements may need to be reset.

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.
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 home position.

Detecting a Malfunction: If the main valve elements are not both actuated or de-actuated synchronously, the valve defaults to the locked-out position so that outlet port 2 receives full inlet pressure, and outlet port 4 is exhausted through port 5. The valve must now be "reset" to resume normal operation.

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 home position. Actuation of the reset piston also opens the reset poppet, thereby, immediately exhausting pilot supply air, thus, preventing valve operation during reset. De-actuation of reset pistons causes the reset poppets to close and pilot supply timing chambers 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 (which includes an integral manual reset button) mounted on the reset adapter.



Valve Schematic

Status Indicator: The optional 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.

Electrical Connectors

Basic Valve Size	Electrical Connector Form	Electrical Connector Type	Cord Length meters (feet)	Cord Diameter	Electrical Connector Model Number		
					Without Light	Lighted Connector	
						24 Volts DC	120 Volts AC
0	EN 175301-803 Form C	Prewired Connector	3 (10)	8-mm	2449K77	2450K77-W	2450K77-Z
		Connector Only	–	–	2452K77	2453K77-W	2453K77-Z
2	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

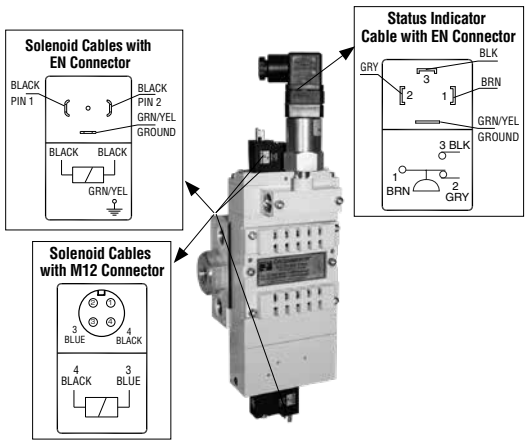
CAUTIONS: *Do not use electrical connectors with surge suppressors, as this may increase valve response time when de-actuating the solenoids.*

Preassembled Wiring Kits

Basic Valve Size	Solenoid Connector Type	Kit Number			Length meters (feet)
		Connector without Light	Lighted Connector		
			24 Volts DC	120 Volts AC	
0*	EN 175301-803 Form A and Form C	2526H77	2529H77-W	2529H77-Z	5 (16.4)
		2527H77	2530H77-W	2530H77-Z	10 (32.8)
2#	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. 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.
Kits include 1 cable for the status indicator, and 3 cables with connector plus a cord grip for each.



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

Valve and Base Assembly

SIL 3 Functional Safe

Cat. 4 PL e

DGUV Test HSM 15026 Sicherheit geprüft tested safety

CE

ISO 13849-1
CAT 4, PL e

5 Ports, 4-Way 2-Position Valve, Pressure Return

Port Sizes		Basic Size	Status Indicator Switch	Valve Model Number*		C_v				Weight lb (kg)
1	2, 4			NPT Threads	G Threads	1-2	1-4	2-3	4-5	
1/4	1/4	0	With#	CM26PNA00P11	CM26PDA00P11	0.8	0.6	0.5	1.1	6.15 (2.79)
			Without	CM26PNA00P1X	CM26PDA00P1X	0.8	0.6	0.5	1.1	5.60 (2.54)
3/8	3/8	0	With#	CM26PNA01P11	CM26PDA01P11	0.8	0.6	0.5	1.1	6.05 (2.74)
			Without	CM26PNA01P1X	CM26PDA01P1X	0.8	0.6	0.5	1.1	5.50 (2.49)
1/2	1/2	2	With#	CM26PNA22P1X	CM26PDA22P1X	3	2.5	2	3.9	14.45 (6.56)
			Without	CM26PNA22P11	CM26PDA22P11	3	2.5	2	3.9	13.80 (6.26)

* Valve includes pressure switch status indicator with DIN type electrical connection, for pressure switch status indicator with M12 type electrical connection consult ROSS.

Valves, Manifold Bases, and End Stations for Manifold Assemblies

In addition to the manifold, an end station kit with a check valve must be ordered for each assembly. The number of manifolds with a single supply inlet will be limited to the pressure and flow rate of the system. Too many manifolds may result in too large of an internal pressure drop resulting in valve faults. The manifold end station kit with dual inlet check will allow the manifold to be supplied with air from both ends of the assembly.

End Station

End Station with Check Valve

Manifold Base

Port Size		Basic Size	Valve without Sub-Base		Manifold Base Model Number		Manifold End Station w/ Check Valve Kit Number		Dual Supply Manifold End Station w/ Check Valves Kit Number	
1	2, 4		Status Indicator Switch	Valve Model Number	NPT Threads	G Threads	NPT Threads	G Threads	NPT Threads	G Threads
1/4	1/4	0	With*	CM26PNA0XP11	Y1951D91	YD1951D91	699K86	D699K86	701K86	D701K86
			Without	CM26PNA0XP1X	Y1951D91	YD1951D91	699K86	D699K86	701K86	D701K86
3/8	3/8	0	With*	CM26PNA0XP11	Y1949D91	YD1949D91	698K86	D698K86	700K86	D700K86
			Without	CM26PNA0XP1X	Y1949D91	YD1949D91	698K86	D698K86	700K86	D700K86
1/2	1/2	2	With*	CM26PNA22P11	Y1955D91	YD1955D91	702K86	D702K86	704K86	D704K86
			Without	CM26PNA22P1X	Y1955D91	YD1955D91	702K86	D702K86	704K86	D704K86

* Valve includes pressure switch status indicator with DIN type electrical connection, for pressure switch status indicator with M12 type electrical connection consult ROSS.

STANDARD SPECIFICATIONS (for valves on this page):

Construction Design	Double spool and sleeve
Mounting Type	Base
Temperature	**Ambient:** 15° to 122°F (-10° to 50°C)
	Media: 40° to 175°F (4° to 80°C)
Flow Media	Filtered air
Operating Pressure	40 to 150 psig (3 to 10 bar)
	Pilot supply pressure must be equal or greater than inlet pressure, but should not exceed maximum inlet pressure
Pressure Switch Rating	Max Current 4A, Max 250 volts AC Max Current 50 mA, Max 24 volts DC
Pressure Switch signal indicates when the input signals or parts movement is asynchronous.	

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.
Construction Material	**Valve Body:** Cast Aluminum **Spool:** Stainless Steel **Seals:** Buna-N
Functional Safety Data: Category 4, PL e; B_{10D}: 20,000,000; PFH_D: 7.71x10^{-9}; $MTTF_D$: 301.9 (n_{op}: 662400) **Certifications:** CE Marked for applicable directives, DGUV Test **Vibration/Impact Resistance:** Tested to BS EN 60068-2-27	
Conformity	ISO 13849-1

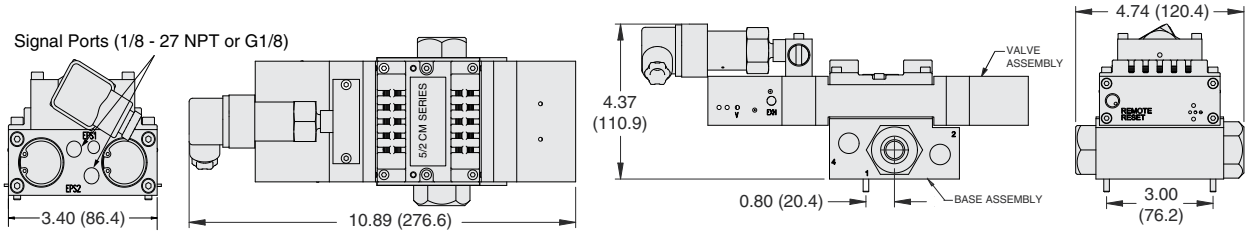
Meets Standards EN13736 and ANSI B11.2, Safety requirements for Pneumatic Cylinder Presses and other hazardous pneumatic cylinder applications.

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

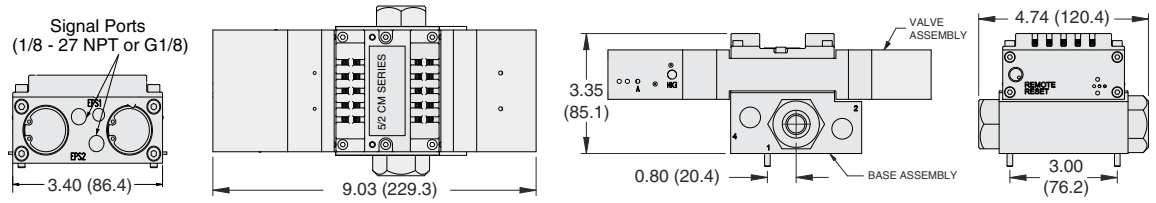
IMPORTANT NOTE: Please read carefully and thoroughly all of the **CAUTIONS, WARNINGS** on the inside back cover.

Size 0 – Valve and base assembly, with remote reset and status indicator switch

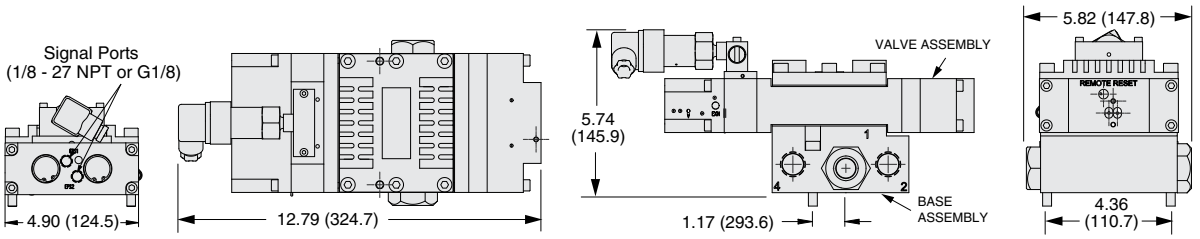
Valve Dimensions – inches (mm)



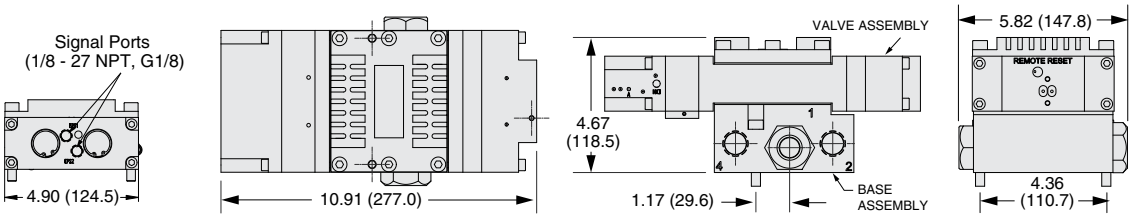
Size 0 – Valve and base assembly, with remote reset and without status indicator switch



Size 2 – Valve and base assembly, with remote reset and status indicator switch

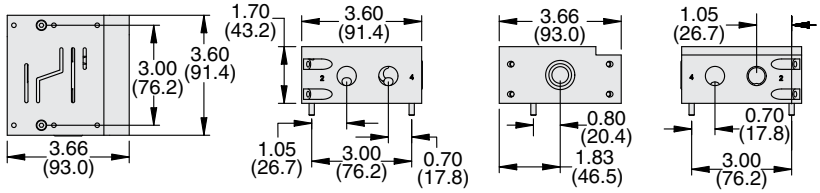


Size 2 – Valve and base assembly, with remote reset and without status indicator switch

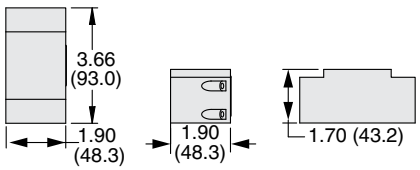


Dimensions – inches (mm)

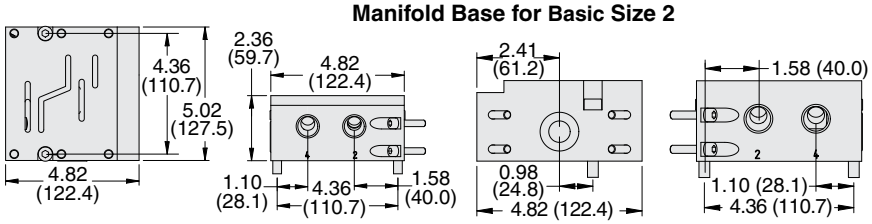
Manifold Base for Basic Size 0



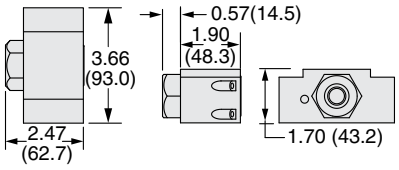
End Station for Basic Size 0



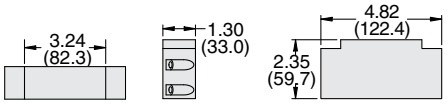
Manifold Base for Basic Size 2



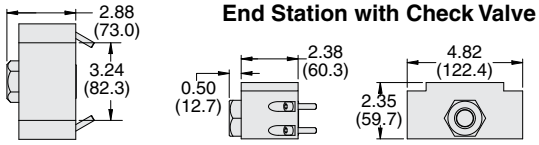
End Station with Check Valve for Basic Size 0



End Station for Basic Size 2



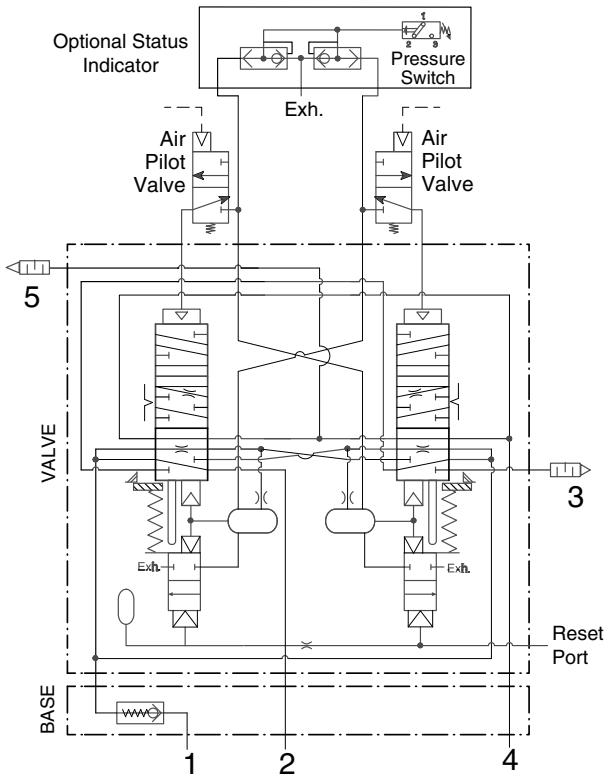
End Station with Check Valve for Basic Size 2



Normal Operation: The valve is operated by pressurizing both pilot supply ports simultaneously. This causes both main valve elements to be actuated so that air from inlet port 1 flows to outlet port 4, but not to port 2. Air downstream of port 2 is exhausted through port 3.
When the pilot supply ports are de-pressurized, both valve elements are de-actuated, and air then flows from inlet port 1 to outlet port 2, but no longer to outlet port 4. Air downstream of port 4 is exhausted through port 5. On first operation, or after repair, the pilot valve supply circuit and inherent monitoring elements may need to be reset.

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.
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 home position.

Detecting a Malfunction: If the main valve elements are not both actuated or de-actuated synchronously, the valve defaults to the locked-out position so that outlet port 2 receives full inlet pressure, and outlet port 4 is exhausted through port 5. The valve must now be "reset" to resume normal operation.



Valve Schematic

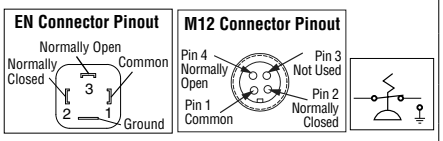
Resetting the Valve: The valve will remain in the locked-out position, even if the inlet air supply is removed and re-applied.
A remote reset signal must be applied to reset the valve. Reset is accomplished by momentarily pressurizing the reset port. Actuation of the reset piston physically pushes the main valve elements to their home position. Actuation of the reset piston also opens the reset poppet, thereby, immediately exhausting pilot supply air, thus, preventing valve operation during reset. De-actuation of reset pistons causes the reset poppets to close and pilot supply timing chambers to fully pressurize. Reset pressure can be applied by a remote 3/2 normally closed valve.

Status Indicator: The optional 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.

Options – For Verification Of Downstream PRESSURE RELEASE

Pressure Switches (Electrical) for Energy Release Verification

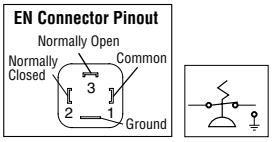
Connection Type	Model Number	Port Threads
EN 175301-803 Form A	586A86	1/8 NPT
M12	1153A30	
Factory preset, 5 psi (0.3) - falling		



May be installed on all valves with pressure sensing port.
Provides means to verify the release of downstream pressure to next obstruction.

Redundant Downstream Feedback Switch for Energy Release Verification

Connection Type	Model Number	Port Threads
EN 175301-803 Form A	RC026-13	3/8 NPT
Factory preset, 5 psi (0.3) - falling		



May be installed downstream on all double valves. Provides a redundant means to verify the release of downstream pressure to next obstruction.

CrossMirror® Control Reliable Double Valves with Automatic Reset – Solenoid Pilot Controlled

Safe Cylinder Return 77 Series

This valve is constructed with precision, stainless steel spools as the main valve elements, and is designed to offer added safety to the operation of many pneumatically controlled machines. The Pressure switch provides a signal when valve is in a faulted position.

SIL 3 Functional Safe

Cat. 4 PL e

DGUV Test HSM 02064 Sicherheit seprüft tested safety

ISO 13849-1 CAT 4, PL e

5 Ports, 4-Way 2-Position Valve

Port Sizes		Basic Size	Pressure Switch	Model Number# (valve and base)		C_v				Weight lb (kg)	Model Number# (valve only)	Model Number (base only)	
1	2, 4			NPT Threads	BSPP Threads	1-2	1-4	2-3	4-5			NPT Threads	G Threads
1/2	3/8	2	With*	Y7776A3411W	YD7776A3411W	2	1.6	1.6	2.8	8.4 (3.8)	Y7776A3401W	Y996C91	YD996C91
			Without	Y7776A3410W	YD7776A3410W	2	1.6	1.6	2.8	7.6 (3.4)	Y7776A3400W	Y996C91	YD996C91
3/4	1/2	4	With*	Y7776A4421W	YD7776A4421W	3.2	3.4	2.7	7.2	11.2 (5.1)	Y7776A4401W	Y1049C91	YD1049C91
			Without	Y7776A4420W	YD7776A4420W	3.2	3.4	2.7	7.2	10.2 (4.6)	Y7776A4400W	Y1049C91	YD1049C91
3/4	3/4	4	With*	Y7776A5411W	YD7776A5411W	3.2	3.4	2.7	7.2	11.2 (5.1)	Y7776A4401W	Y1153C91	YD1153C91
			Without	Y7776A5410W	YD7776A5410W	3.2	3.4	2.7	7.2	10.2 (4.6)	Y7776A4400W	Y1153C91	YD1153C91
SAE 12		4	With*	YS7776A4H10W		3.2	3.4	2.7	7.2	11.2 (5.1)	Y7776A4401W	Y1159G91	
			Without	YS7776A4H11W		3.2	3.4	2.7	7.2	10.2 (4.6)	Y7776A4400W	Y1159G91	

 # Voltage: W=24 VDC; Z=110 VAC, 50 Hz or 120 VAC, 50/60 Hz, e.g., Y7776A3411Z. For other voltages consult ROSS.

** Valve includes pressure switch status indicator with DIN type electrical connection, for pressure switch status indicator with M12 type electrical connection consult ROSS.

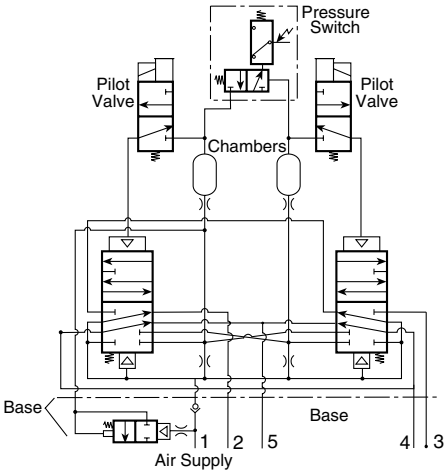
Model with pressure switch shown

Valve Operation

Normal Operation: After installation the valve is operated by energizing both solenoid pilots (S1 and S2) simultaneously. This causes both main valve elements to be actuated so that air from inlet port 1 flows to outlet port 4. Air downstream of port 2 is exhausted through port 3. When the solenoid pilots are de-energizing, both valve elements are de-actuated, and air then flows from inlet port 1 to outlet port 2. Air downstream of port 4 is exhausted through port 5.

Safety Function: If the two main valve elements are not actuated or de-actuated synchronously, within 500 ms, the valve defaults so that outlet port 2 receives full inlet pressure, and outlet port 4 is exhausted through port 5. If this abnormal operation is the result of a temporary circumstance, the valve will be ready to resume normal operation as soon as both pilot signal ports have been de-energized and both main valve elements have returned to their normal ready-to-run position. Applying the electrical signal to both solenoids simultaneously will resume normal operation. If the cause of the abnormal operation is still present, the valve will either remain in the default position (pressure on port 2 and not port 4) or will again go into this position on the next actuation attempt. The source of the abnormality must be investigated and corrected before further operation.

Pressure Switch: Valves with model numbers ending in the number 1 have a pressure switch to provide user feedback when movement of the main valve elements was asynchronous.



Explosion proof solenoid pilot available, for more information consult ROSS.

STANDARD SPECIFICATIONS (for valves on this page):

Construction Design	Double Spool and Sleeve
Mounting Type	Base
Solenoids	According to VDE 0580. Enclosure rating according to DIN 400 50 IP 65. Three (with pressure switch) or two solenoids (without pressure switch), rated for continuous duty
Voltage	24 volts DC; 110 volts AC, 50 Hz; 120 volts AC, 50/60 Hz
Power Consumption (each solenoid)	6.5 watts maximum on DC, 6.5 watts on 50/60 Hz
Enclosure Rating	IP65, IEC 60529
Electrical Connection	EN 175301-803 Form A. Uses cord-grip connectors at solenoids
Temperature	**Ambient:** 40° to 122°F (4° to 50°C) **Media:** 40° to 175°F (4° to 80°C)

Flow Media	Filtered air
Inlet Pressure	40 to 150 psig (2.5 to 10.3 bar)
NOTE: Main solenoids must be off when performing reset procedure.	
Construction Material	**Valve Body:** Cast Aluminum **Spool:** Stainless Steel **Seals:** Buna-N
Functional Safety Data: Category 4, PL e; B_{10D}: 20,000,000; PFH_D: 7.71x10-9 ; $MTTF_D$: 301.9 (nop: 662400). **Certifications:** CE Marked for applicable directives, DGUV Test **Vibration/Impact Resistance:** Tested to BS EN 60068-2-27	
Conformity	ISO 13849-1

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

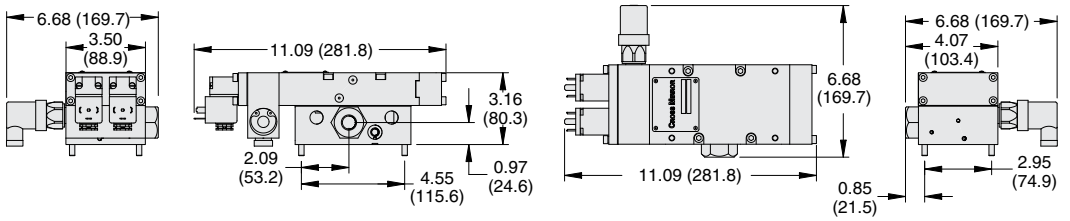
These valves are not designed for controlling clutch/brake mechanisms on mechanical power presses.

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

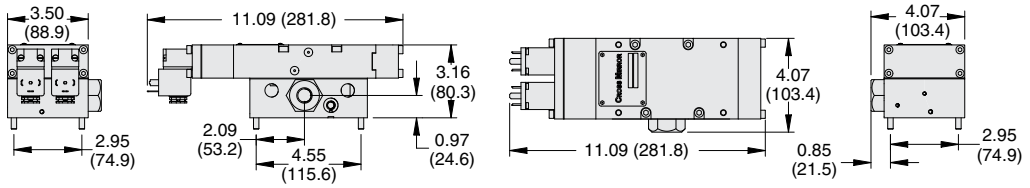
Online Version 02/19/20

Basic Size 2 – Valve and base assembly, with remote reset and status indicator switch

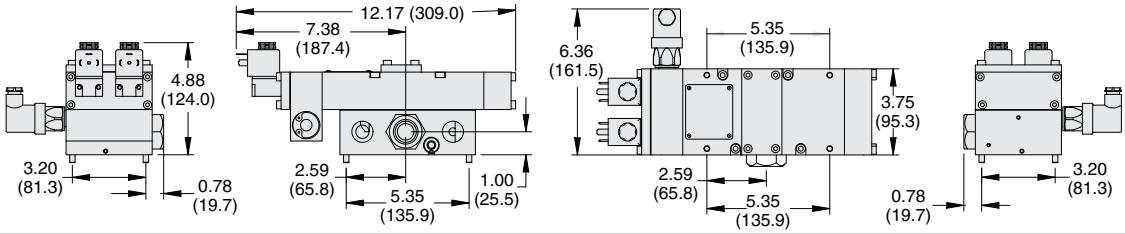
Valve Dimensions – inches (mm)



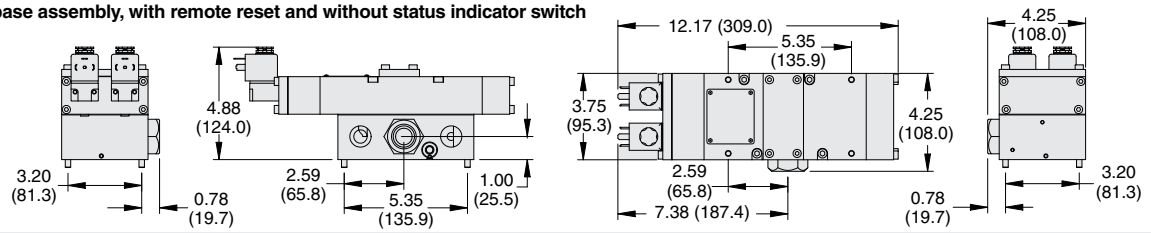
Basic Size 2 – Valve and base assembly, with remote reset and without status indicator switch



Basic Size 4 – Valve and base assembly, with remote reset and status indicator switch



Basic Size 4 – Valve and base assembly, with remote reset and without status indicator switch



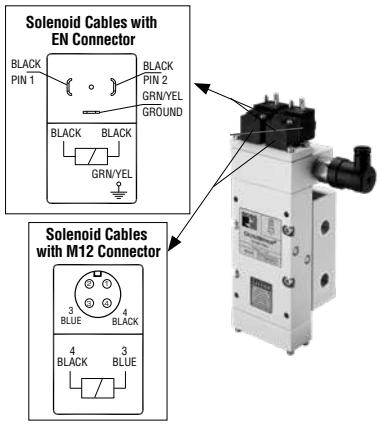
Accessories & Options

	Electrical Connector Form	Electrical Connector Type	Cord Length meters (feet)	Cord Diameter	Electrical Connector Model Number		
					Without Light	Lighted Connector	
						24 Volts DC	120 Volts AC
Electrical Connectors	EN 175301-803 Form A	Prewired Connector (18 gauge)	2 (6½)	6-mm	721K77	720K77-W	720K77-Z
				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

***CAUTIONS:** Do not use electrical connectors with surge suppressors, as this may increase valve response time when de-actuating the solenoids.*

	Pressure Switch Model Number		Pressure Switch Connector
	24 Volts DC	120 Volts AC	Model Number
Pressure Switches & Pressure Switch Connectors	798E30	518E30	522E30

	Solenoid Connector Type	Kit Number			Length meters (feet)
		Connector without Light	Lighted Connector		
			24 Volts DC	120 Volts AC	
Preassembled Wiring Kits	EN 175301-803 Form A	2243H77	2268H77-W	2268H77-Z	5 (16.4)
		2244H77	2269H77-W	2269H77-Z	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.				



CrossMirror® Control Reliable Double Valves with Automatic Reset – Pressure Controlled

Safe Cylinder Return 77 Series

5 Ports, 4-Way 2-Position Valve

Port Sizes 1	Port Sizes 2, 4	Basic Size	Pressure Switch	Model Number# (valve and base) NPT Threads	Model Number# (valve and base) G Threads	C_v 1-2	C_v 1-4	C_v 2-3	C_v 4-5	Weight lb (kg)	Model Number# (valve only)	Model Number (base only) NPT Threads	Model Number (base only) G Threads
1/2	3/8	2	With*	Y7786A3411W	YD7786A3411W	2	1.6	1.6	2.8	8.4 (3.8)	Y7786A3401W	Y996C91	YD996C91
			Without	Y7786A3410	YD7786A3410	2	1.6	1.6	2.8	7.6 (3.4)	Y7786A3400	Y996C91	YD996C91
3/4	1/2	4	With*	Y7786A4421W	YD7786A4421W	3.2	3.4	2.7	7.2	11.6 (5.3)	Y7786A4401W	Y1049C91	YD1049C91
			Without	Y7786A4420	YD7786A4420	3.2	3.4	2.7	7.2	10.6 (4.8)	Y7786A4400	Y1049C91	YD1049C91
3/4	3/4	4	With*	Y7786A5411W	YD7786A5411W	3.2	3.4	2.7	7.2	11.6 (5.3)	Y7786A3401W	Y1153C91	YD1153C91
			Without	Y7786A5410	YD7786A5410	3.2	3.4	2.7	7.2	10.6 (4.8)	Y7786A3400	Y1153C91	YD1153C91
SAE 12		4	With*	YS7786A4H11W		3.2	3.4	2.7	7.2	11.6 (5.3)	Y7786A4401W	Y1159G91	
			Without	YS7786A4H10		3.2	3.4	2.7	7.2	10.6 (4.8)	Y7786A4400	Y1159G91	

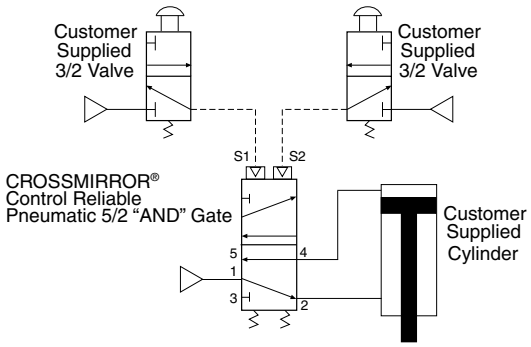
 # Voltage: W=24 VDC; Z=110 VAC, 50 Hz or 120 VAC, 50/60 Hz, e.g., Y7786A3411Z. For other voltages consult ROSS.
** Valve includes pressure switch status indicator with DIN type electrical connection, for pressure switch status indicator with M12 type electrical connection consult ROSS.

SIL 3 Functional Safe
Cat. 4 PL e
DGUV Test HSM 13022 Sicherheit geprüft tested safety
ISO 13849-1 CAT 4, PL e

This 77 Series 5/2 CrossMirror® valve is a control reliable, two hand pressure controlled 4-way double valve that is controlled by two separate pneumatic signals essentially providing "AND" gate control for the output ports. Both pilot signals must be provided within approximately 500 milliseconds of each other to actuate the valve.
Proper actuation shifts output pressure to port 4. If the valve is not actuated, not provided appropriate pneumatic signals within the discordance window or if the valve actuates abnormally, inlet pressure will only be passed to port 2 - cylinder retracted.

This valve is constructed with precision, stainless steel spools as the main valve elements, and is designed to offer added safety to the operation of many pneumatically controlled machines.

Typical 2-Hand-Anti-Tie-Down Application

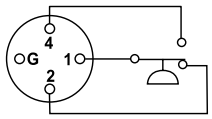


Accessories & Options

Pressure Switches & Pressure Switch Connectors	Pressure Switch Model Number		Pressure Switch Connector
	24 Volts DC	120 Volts AC	Model Number
	798E30	518E30	522E30

Status Indicator (pressure switch)

Terminals 1 and 4 are connected when air pressure is present and the valve is "Ready-to-Run". If an abnormal operation has occured or pressure is removed from the valve inlet, terminals 1 and 2 are connected.
Note: DC voltage pressure switches do not have a ground terminal.



Pin 1: Common
Pin 2: Normally Closed
Pin G: Not used
Pin 4 : Normally Open

STANDARD SPECIFICATIONS (for valves on this page):

Construction Design	Double Spool and Sleeve
Mounting Type	Base
Temperature	**Ambient:** 40° to 120°F (4° to 50°C)
	Media: 40° to 175°F (4° to 80°C)
Flow Media	Filtered air
Operating Pressure	40 to 100 psig (2.7 to 7 bar)
	Pilot supply pressure must be equal or greater than inlet pressure, but should not exceed maximum inlet pressure
Pressure Switch Rating	Max Current 4A, Max 250 volts AC Max Current 50 mA, Max 24 volts DC

Pressure Switch signal indicates when the input signals or parts movement is asynchronous.

Construction Material	**Valve Body:** Cast Aluminum **Spool:** Stainless Steel **Seals:** Buna-N
Functional Safety Data: Category 4, PL e; B_{10D}: 20,000,000; PFH_D: 7.71x10^{-9}; $MTTF_D$: 301.9 (n_{op}: 662400)	
Certifications: CE Marked for applicable directives, DGUV Test	
Vibration/Impact Resistance: Tested to BS EN 60068-2-27	
Conformity	ISO 13849-1

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

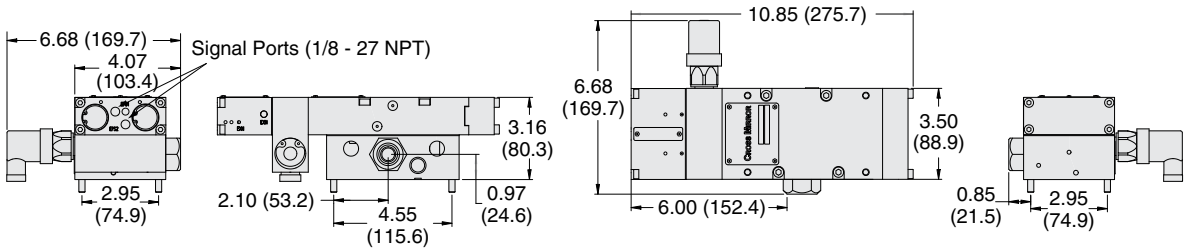
These valves are not designed for controlling clutch/brake mechanisms on mechanical power presses.

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

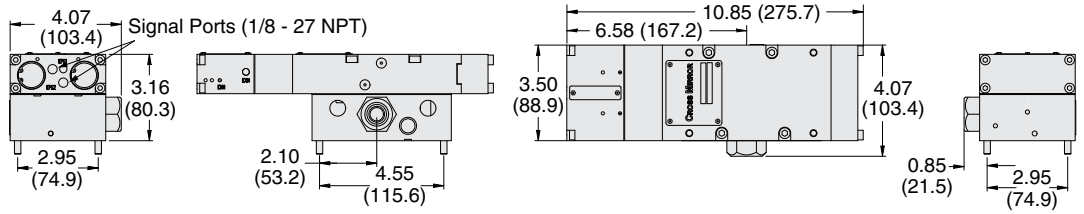
Valve Dimensions – inches (mm)

A

Basic Size 2 – Valve and base assembly, with remote reset and status indicator switch

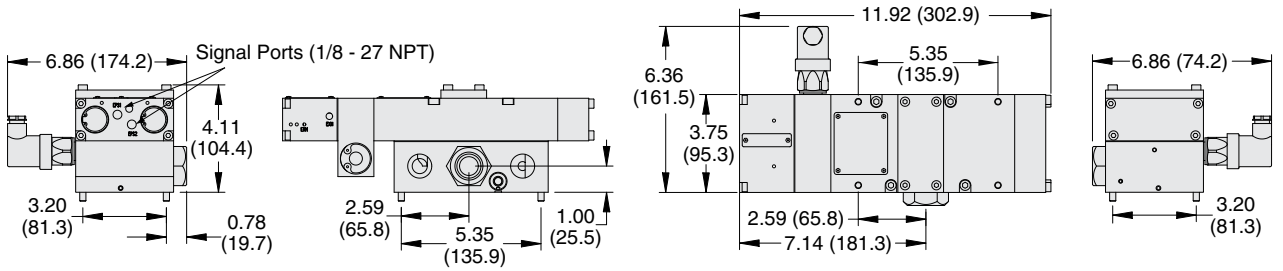


Basic Size 2 – Valve and base assembly, with remote reset and without status indicator switch

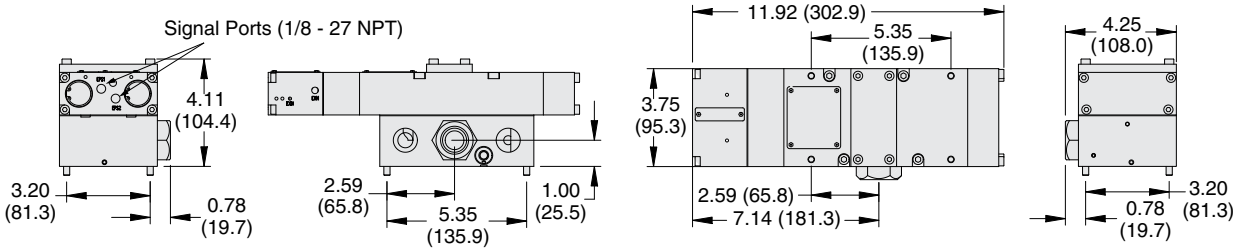


A4

Basic Size 4 – Valve and base assembly, with remote reset and status indicator switch



Basic Size 4 – Valve and base assembly, with remote reset and without status indicator switch



Valve Operation

Normal Operation: After installation the valve is operated by pressurizing both pilot supply ports (S1 and S2) simultaneously. This causes both main valve elements to be actuated so that air from inlet port 1 flows to outlet port 4. Air downstream of port 2 is exhausted through port 3.

When the pilot supply ports are de-pressurized, both valve elements are de-actuated, and air then flows from inlet port 1 to outlet port 2. Air downstream of port 4 is exhausted through port 5.

Pressure Switch: Valves with model numbers ending in the number 1 have a pressure switch to provide user feedback when movement of the main valve elements was asynchronous.

Safety Function: If the two main valve elements are not actuated or de-actuated synchronously, within 500 ms, the valve defaults so that outlet port 2 receives full inlet pressure, and outlet port 4 is exhausted through port 5. If this abnormal operation is the result of a temporary circumstance, the valve will be ready to resume normal operation as soon as both pilot signal ports have been de-pressurized and both main valve elements have returned to their normal ready-to-run position. Applying pressure to both signal ports simultaneously will resume normal operation.

If the cause of the abnormal operation is still present, the valve will either remain in the default position (pressure on port 2 and not port 4) or will again go into this position on the next actuation attempt. The source of the abnormality must be investigated and corrected before further operation.

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

CAUTIONS, WARNINGS And STANDARD WARRANTY

ROSS OPERATING VALVE, ROSS CONTROLS®, ROSS DECCO®, and AUTOMATIC VALVE INDUSTRIAL, collectively the "ROSS Group".

PRE-INSTALLATION or SERVICE

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

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

3. All applicable instructions should be read and complied with before using any fluid power system to prevent harm to persons or equipment. In addition, overhauled or serviced valves must be functionally tested prior to installation and use. If you have any questions, call your nearest ROSS Group location.

4. Each ROSS Group Product should be used within its specification limits. In addition, use only ROSS Group components to repair ROSS Group Products.

WARNINGS: Failure to follow these instructions can result in personal injury and/or property damage.

FILTRATION and LUBRICATION

1. Dirt, scale, moisture, etc., are present in virtually every air system. Although some valves are more tolerant of these contaminants than others, best performance will be realized if a filter is installed to clean the air supply, thus preventing contaminants from interfering with the proper performance of the equipment. The ROSS Group recommends a filter with a 5-micron rating for normal applications.

2. All standard ROSS Group filters and lubricators with polycarbonate plastic bowls are designed for compressed air applications only. Use the metal bowl guard, where provided, to minimize danger from high pressure fragmentation in the event of bowl failure. Do not expose these products to certain fluids, such as alcohol or liquefied petroleum gas, as they can cause bowls to rupture, creating a combustible condition and hazardous leakage. Immediately replace crazed, cracked, or deteriorated bowls.

3. Only use lubricants which are compatible with materials used in the valves and other components in the system. Normally, compatible lubricants are petroleum base oils with oxidation inhibitors, an aniline point between 180°F (82°C) and 220°F (104°C), and an ISO 32, or lighter, viscosity. Avoid oils with phosphate type additives which can harm polyurethane components, potentially leading to valve failure which risks personal injury, and/or damage to property.

WARNINGS: Failure to follow these instructions can result in personal injury and/or property damage.

AVOID INTAKE/EXHAUST RESTRICTION

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

2. Do not restrict a valve's exhaust port as this can adversely affect its operation. Exhaust silencers must be resistant to clogging and must have flow capacities at least as great as the exhaust capacities of the valves. Contamination of the silencer can result in reduced flow and increased back pressure.

WARNINGS: Failure to follow these instructions can result in personal injury and/or property damage.

SAFETY APPLICATIONS

1. Mechanical Power Presses and other potentially hazardous machinery using a pneumatically controlled clutch and brake mechanism must use a press control double valve with a monitoring device. A double valve without a self-contained monitoring device should be used only in conjunction with a control system which assures monitoring of the valve. All double valve installations involving hazardous applications should incorporate a monitoring system which inhibits further operation of the valve and machine in the event of a failure within the valve mechanism.

2. Safety exhaust (dump) valves without a self-contained monitoring device should be used only in conjunction with a control system which assures monitoring of the valve. All safety exhaust valve installations should incorporate a monitoring system which inhibits further operation of the valve and machine in the event of a failure within the valve mechanism.

3. Per specifications and regulations, the ROSS L-O-X® and L-O-X® with EEZ-ON®, N06 and N16 Series operation products are defined as energy isolation devices, NOT AS EMERGENCY STOP DEVICES.

WARNINGS: Failure to follow these instructions can result in personal injury and/or property damage.

STANDARD WARRANTY

All products sold by the ROSS Group are warranted for a one-year period [with the exception of Filters, Regulators and Lubricators ("FRLs") which are warranted for a period of seven (7) years] from the date of purchase. All products are, during their respective warranty periods, warranted to be free of defects in material and workmanship. The ROSS Group's obligation under this warranty is limited to repair, replacement or refund of the purchase price paid for products which the ROSS Group has determined, in its sole discretion, are defective. All warranties become void if a product has been subject to misuse, misapplication, improper maintenance, modification or tampering. Products for which warranty protection is sought must be returned to the ROSS Group freight prepaid.

THE WARRANTY EXPRESSED ABOVE IS IN LIEU OF AND EXCLUSIVE OF ALL OTHER WARRANTIES AND THE ROSS GROUP EXPRESSLY DISCLAIMS ALL OTHER WARRANTIES EITHER EXPRESSED OR IMPLIED WITH RESPECT TO MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. THE ROSS GROUP MAKES NO WARRANTY WITH RESPECT TO ITS PRODUCTS MEETING THE PROVISIONS OF ANY GOVERNMENTAL OCCUPATIONAL SAFETY AND/OR HEALTH LAWS OR REGULATIONS. IN NO EVENT IS THE ROSS GROUP LIABLE TO PURCHASER, USER, THEIR EMPLOYEES OR OTHERS FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES WHICH MAY RESULT FROM A BREACH OF THE WARRANTY DESCRIBED ABOVE OR THE USE OR MISUSE OF THE PRODUCTS. NO STATEMENT OF ANY REPRESENTATIVE OR EMPLOYEE OF THE ROSS GROUP MAY EXTEND THE LIABILITY OF THE ROSS GROUP AS SET FORTH HEREIN.

Americas

U.S.A.

ROSS CONTROLS
+1-248-764-1800
sales@rosscontrols.com
rosscontrols.com

Customer Service
1-800-GET-ROSS (438-1800)

Technical Service
1-888-TEK-ROSS (835-7677)

Canada

ROSS CANADA
+1-416-251-7677
sales@rosscanada.com
rosscanada.com
6077170 CANADA INC.
An Independent Representative

Brazil

ROSS SOUTH AMERICA Ltda.
+55-11-4335-2200
vendas@rosscontrols.com
rosscontrols.com.br

Europe

Germany

ROSS EUROPA GmbH
+49-6103-7597-100
sales@rosseuropa.com
rosseuropa.com

United Kingdom

ROSS UK Ltd.
+44-1543-671495
sales.uk@rosscontrols.com
rossuk.co.uk

France

ROSS FRANCE SAS
+33-1-49-45-65-65
sales@rossfrance.com
rossfrance.com

Asia & Pacific

Japan

ROSS ASIA K.K.
+81-42-778-7251
custsvc.ra@rosscontrols.com
rossasia.co.jp

India

ROSS CONTROLS INDIA Pvt. Ltd.
+91-44-2624-9040
sales.ri@rosscontrols.com
rosscontrols.com

China

ROSS CONTROLS (CHINA) Ltd.
+86-21-6915-7961
sales.cn@rosscontrols.com
rosscontrolschina.com

Full-Service Global Locations

There are ROSS Distributors Throughout the World

To meet your requirements across the globe, ROSS distributors are located throughout the world. Through ROSS or its distributors, guidance is available for the selection of ROSS products, both for those using pneumatic components for the first time and those designing complex systems.

Other literature is available for engineering, maintenance, and service requirements.

If you need products or specifications not shown in this catalog, please visit ROSS' website, contact ROSS or your ROSS distributor. The ROSS Support Team will be happy to assist you in selecting the best product for your application.

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