

# **ENERGY-ISOLATION & EEZ-ON<sup>®</sup> PRODUCTS**

**L-O-X<sup>®</sup> Valves • EEZ-ON<sup>®</sup> Valves  
L-O-X<sup>®</sup> Valves with EEZ-ON<sup>®</sup> Operation**



• *Manufacturers of Premium Pneumatic Controls since 1921* •



Consider it **DONE!**

# Regulations for Workplace Safety

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The Occupational Safety and Health Administration (OSHA) regulation (29 CFR 1910.147) details safety requirements for the control of hazardous energy during the maintenance and servicing of machines and equipment.

## WHAT DOES THE RULE REQUIRE?

In general terms, the rule requires that energy sources (pneumatic, electric, hydraulic, etc.) be shut off or disconnected while equipment is being serviced. Furthermore, the disconnected valve or switch must be locked to prevent reactivation while anyone is working on the equipment.

In the case of air-operated equipment, a lockout valve must be used to cut off the air supply to the equipment and exhaust any stored or residual downstream air. (OSHA Regulation 29 CFR 1910.147 lists a number of requirements for the control of hazardous energy sources.) In addition, ROSS L-O-X® and EEZ-ON® products assist manufacturers in complying with European regulation **EN 1037** (Safety of Machinery). For complete information, please read the entire regulations.

## WHO IS AFFECTED BY THE RULE?

An estimated 631,000 businesses are affected by this OSHA regulation. The majority of those affected are in the manufacturing and servicing industries. Among individual workers, equipment operators and those performing service on equipment are at the greatest risk of injury. Workers involved with packaging equipment, presses, and conveyor systems are also said to be at high risk.

## WHAT ARE THE BENEFITS OF THE RULE?

The Secretary of Labor says the procedures were developed to protect 39 million American workers from injury, and more than six percent of all workplace deaths can be eliminated in the affected industries. Statistics indicate that implementation of the regulation could prevent 120 deaths and 60,000 injuries annually.

## HOW CAN THE RULE BE IMPLEMENTED?

The rule requires equipment to have “energy isolation devices” (to isolate the equipment from its energy sources), and that such devices be capable of being locked in the “off” position. Formal procedures must be established to de-energize the equipment, isolate it, and ensure that any stored energy (for example, air pressure trapped downstream in a system) has been dissipated. Employee training in these procedures is mandatory. If your company uses pneumatically-controlled equipment, or if you are a manufacturer of pneumatically operated equipment, OSHA rules can have a substantial effect on your business. As an employer, compliance may involve modifications to the air control systems for equipment in your plant. As a manufacturer, the new machines or equipment you deliver should include lockout-and-exhaust devices as a part of your standard package.

## Referenced Standards:

All standards are subject to revision. Parties are encouraged to investigate and apply the most recent editions of the standards indicated below.

OSHA 29 CFR 1910.147  
CSA Z142-02\*  
CSA Z460-05\*  
ISO 13849-1  
ISO 14118:2000  
EN 1037  
ANSI/ASSE Z244.1-2003  
ANSI/PMMI B155.1 - 2006\*

***Here are some key points about the control of pneumatic energy:***

### SHUT-OFF VALVE REQUIRED

Each piece of equipment must have a shut-off valve to isolate the equipment from its air supply and so render the equipment inoperative.

### SHUT-OFF VALVE SHOULD BE LOCKABLE

The valve is lockable if it is designed to allow the use of a padlock to keep the valve in the closed position.

### PRESSURIZED DOWNSTREAM AIR MUST BE RELIEVED

In addition to locking out the air supply, all downstream air must be depressurized by providing an exhaust to atmosphere. Workers must also verify isolation and de-energizing, while being certain there is no reaccumulation of pressurized air during service or maintenance activities.

### “TAGOUT” MAY REPLACE “LOCKOUT” ONLY UNDER CERTAIN CIRCUMSTANCES

- (1) If energy isolation device cannot be locked out;
- (2) If employer shows that tagout provides safety equivalent to lockout. Whenever major replacement, repair, renovation, or modification of equipment is performed, or when new equipment is installed, energy isolating devices for such equipment must be designed to accept a lockout device.

### ROSS L-O-X® VALVES ARE BUILT TO SATISFY THE TOUGHEST REQUIREMENTS

L-O-X® valves provide shut-off control, they are lockable, and they exhaust downstream air to atmosphere. There are several different designs to meet virtually every plant requirement.

#### \* ROSS L-O-X® VALVES ARE EASY TO OPERATE

Positive: push/pull & detented.

#### \* ROSS L-O-X® VALVES HAVE EXHAUST PORT EQUAL OR GREATER THAN SUPPLY

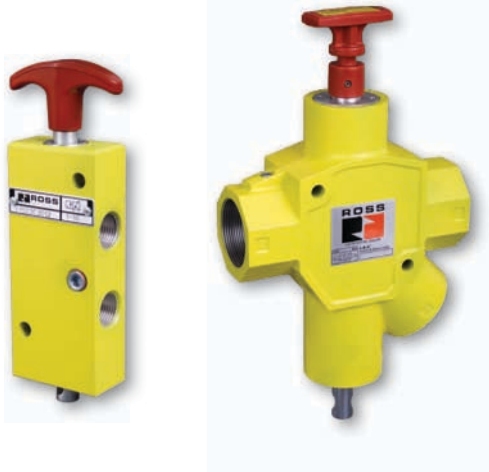
High Flow: dumps pressure quickly.

#### \* ROSS L-O-X® VALVES HAVE VISIBLE INDICATOR OF PRESSURE RELEASE

Verification port, optional pop-up indicator.

# How Users of Pneumatic Equipment Can Comply with OSHA Rules

Here's how our famous L-O-X® valve helps...



**L-O-X® is the simple and effective solution:** The manual L-O-X® valve controls air flow simply by a push of its large red handle in or out. The valve is open when the handle is pulled outward and air then moves freely from inlet to outlet ports. A short inward push of the handle closes the inlet to the flow of air and connects the outlet port to the exhaust port immediately exhausting downstream compressed air.

For your convenience, L-O-X® valves are available in pipe sizes from 1/4 to 3 inches.

If your machines aren't already equipped with L-O-X® valve or L-O-X® valve with EEZ-ON® operation valve, here are six good reasons why they should be:

- **Effectiveness:** A L-O-X® valve not only isolates the equipment by shutting off air supply, it exhausts stored or residual downstream air immediately.
- **Ease of Use:** Air shutoff is simple; just push in the bright red handle! There's no turning or twisting and guessing whether the valve is completely open – it's automatic!
- **Locking protection:** L-O-X® valves are designed to allow secure lock-out upon shutdown, using standard padlocks.
- **Reliability:** Special Teflon seals help ensure "shift-ability" even after long periods of non-use.
- **Efficiency:** Large exhaust ports provide rapid exhaust of downstream air and are threaded for silencers or remote exhaust lines.
- **User Confidence:** Three-way valve design opens the system to atmosphere during shut-down. Any leakage past the spool is exhausted faster than it can build up.

And now, with ROSS L-O-X® valves with EEZ-ON® operation, you get even more value. Combining the lockout function of ROSS L-O-X® valve with the gradual start-up capability of the EEZ-ON®, the L-O-X® with EEZ-ON® operation, gives you two safety-related functions in one convenient unit.

## ROSS EEZ-ON® Valves Also Add to Plant Safety

A ROSS EEZ-ON® valve is designed to allow a gradual buildup of downstream air pressure before opening the line to full air flow. This gradual pressure buildup allows cylinders and other work elements to move slowly and more safely into their normal working positions before full line pressure buildup is applied. The time required for full pressure buildup is adjustable.

EEZ-ON® valves are available as either 2/2 (2-port, 2-position) or 3/2 (3-port, 2-position) valves. Either type can be used in conjunction with a L-O-X® valve to supply a lockout and exhaust feature in addition to the gradual buildup of supply pressure.

The L-O-X® valve and EEZ-ON® valve functions can now also be obtained in a combined configuration — the L-O-X® valve with EEZ-ON® operation. In this valve, all the functions are combined in a single valve for the most compact installation possible. See page 4 for more details.

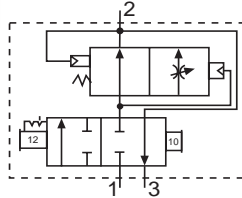
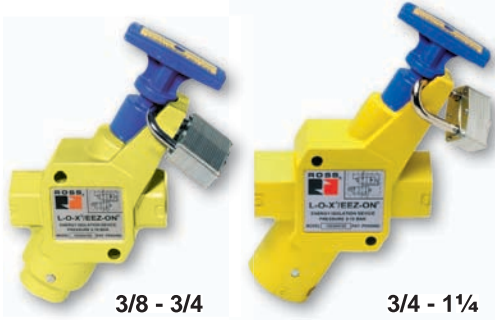


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# Series 15 L-O-X<sup>®</sup> Valves with EEZ-ON<sup>®</sup> Operation

Combines L-O-X<sup>®</sup> Shut-off with EEZ-ON<sup>®</sup> Gradual Starts



The L-O-X<sup>®</sup> with EEZ-ON<sup>®</sup> operation valve combines shut-off certainty with gradual pressurization upon start-up. Special labels and adjustment screw indicates EEZ-ON<sup>®</sup> function.

Combining two functions critical to safety concerns in any application, the ROSS L-O-X<sup>®</sup> valve with EEZ-ON<sup>®</sup> operation provides the shutdown and the gradual start-up (or, “soft start”) capabilities today’s systems require. In addition, because the L-O-X<sup>®</sup> valve with EEZ-ON<sup>®</sup> operation is two units in one, you eliminate the need for multiple components. And that means easier installation and less cost.

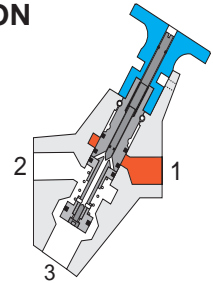
The valve permits the gradual increase of downstream pressure in the pneumatic circuit that has just been actuated. The same unit also features a shut-off and lockout of system air to limit inadvertent actuation. For years, ROSS products have been the industry benchmark in safety-related pneumatic controls, and the tradition continues with the L-O-X<sup>®</sup> valve with EEZ-ON<sup>®</sup> operation.

The exhaust port is threaded for the installation of a silencer or a line for remote exhausting. Two mounting holes are provided to simplify the installation of the L-O-X<sup>®</sup> valve with EEZ-ON<sup>®</sup> operation.

## VALVE OPERATION

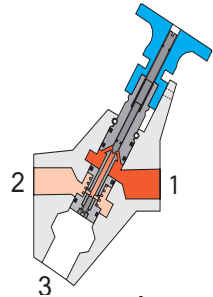
### VALVE CLOSED

With a short push of the blue handle inward, the flow of supply is blocked and downstream air is exhausted via the exhaust port at the bottom of the valve. It is required by OSHA that the L-O-X<sup>®</sup> valve with EEZ-ON<sup>®</sup> operation be padlocked in this position to prevent the handle from being pulled outward inadvertently when potential for human injury exists or servicing machinery.



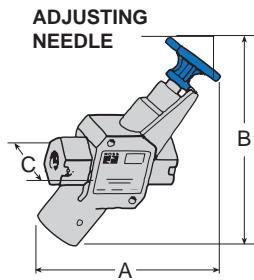
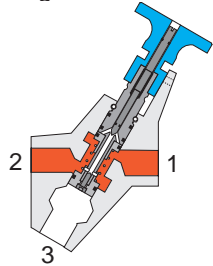
### EEZ-ON<sup>®</sup> VALVE FUNCTION

With the blue handle pulled out, the adjustable needle valve (accessed through top of handle) setting determines the rate of pressure buildup.



### VALVE OPEN

After the blue handle is pulled out and pressure downstream has gradually increased, the valve automatically changes to a fully open state, allowing full flow from inlet to downstream. See “Toggle Open Pressure” under standard specifications.



Port Size		Valve Model	Avg. Cv		Dimensions inches (mm)			EEZ-ON <sup>®</sup>	Weight
In-Out	Exh.	Numbers*	1 to 2	2 to 3	A	B	C	Valve Cv**	lb (kg)
3/8	3/4	Y1523B3102	6.0	8.0	6.4 (163)	8.8 (224)	2.0 (51)	0.6	2.1 (1.0)
1/2	3/4	Y1523B4102	7.1	8.3	6.4 (163)	8.8 (224)	2.0 (51)	0.6	2.1 (1.0)
3/4	3/4	Y1523B5112	8.0	9.5	6.4 (163)	8.8 (224)	2.0 (51)	0.6	2.1 (1.0)
3/4	1 1/4	Y1523B5102	12.0	10.9	7.7 (196)	10.8 (274)	2.3 (58)	3.0	3.2 (1.5)
1	1 1/4	Y1523B6102	13.7	12.0	7.7 (196)	10.8 (274)	2.3 (58)	3.0	3.2 (1.5)
1 1/4	1 1/4	Y1523B7112	16.2	12.8	7.7 (196)	10.8 (274)	2.3 (58)	3.0	3.2 (1.5)

\*Cv from port 1 to port 2 during pressure buildup (before valve opens fully).

## L-O-X<sup>®</sup> Sensing Port

L-O-X<sup>®</sup> Sensing Port - Series 15 manual L-O-X<sup>®</sup> and manual L-O-X<sup>®</sup> valves with EEZ-ON<sup>®</sup> operation are now provided with 1/8 NPT sensing ports, enabling installation of a pressure sensing device such as the Pop-Up Indicator or Pressure Switch shown below. Standards suggest that machine design should include a method for verifying the release of energy after lockout.

The ROSS 988A30 Pop-Up Indicator is constructed for the industrial environment with a brass body and 1/8" NPT connection. It offers 360° visibility and a redundant verification feature. By pushing on the red plunger, the operator can “feel” the presence of pressure and verify that the indicator is performing its sensing function.

The ROSS 586A86 Pressure Switch offers an electronic pressure sensing option that can be integrated into a safety monitoring system, which confirms energy isolation throughout the circuit.

**STANDARD SPECIFICATIONS:** For valves on this page.

**Ambient/Media Temperature:** 40° to 175°F (4° to 80°C).

**Flow Media:** Filtered air; 5 micron filter recommended.

**Inlet Pressure:** 30 to 150 psig (2.1 to 10.3 bar).

**\*Body Paint:** Yellow.

**\*Port Threads:** NPT standard, BSPP. For BSPP threads insert a “D” after “Y” to the model number, e.g., YD1523B3102.

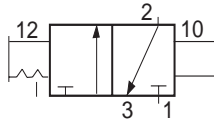
**NOTE:** Per specifications and regulations, these products are defined as energy isolation devices, **NOT AS EMERGENCY STOP DEVICES.**

# Series 15 Manual L-O-X® Valves

- **Reliable, Low-Cost Control**
- **1/4 to 3/8 Ports**



1/4 and 3/8



Manual L-O-X® valve shown padlocked in closed position. The valve can only be locked in the closed position.

Push/pull operation - Push the handle inward to exhaust downstream air (lockable in this position). Pull the handle outward to supply air downstream.

The ROSS LOX® 1/4 and 3/8 inch port size are the newest addition to ROSS' renowned family of safety-related products. Following any FRL components, an energy isolation valve is usually the first valve in the line supplying compressed air to equipment. The energy isolation valve should provide a quick means of shutting off the supply of air and exhausting the downstream lines.

The ROSS manual L-O-X® valve has a large red operating handle for high visibility. When the handle is pulled out, there is full line pressure. A short, full inward push of the handle closes off the flow of air, and quickly exhausts the pressure in the downstream line. This action is swift and doesn't require a difficult, slow, or confusing twisting action.

*NOTE: If a system requires gradual buildup of downstream pressure, see L-O-X® valves with EEZ-ON® operation on page 4.*

The controlling spool of the valve employs seals made of very low-friction material. These seals enable the L-O-X® spool to shift smoothly and easily even after being on standby for a long period of time.

The exhaust port is threaded for the installation of a silencer or a line for remote exhausting. Two mounting holes are provided to simplify the installation of the L-O-X® valve.

Port Size		Valve Model Number	Avg. Cv		Dimensions inches (mm)			Weight lb (kg)
In-Out	Exh.		1 to 2	2 to 3	A	B	C	
1/4	1/4	Y1523D2002	1.84	1.79	2.3 (58)	6.5 (166)	1.0 (26)	0.9 (0.4)
3/8	3/8	Y1523D3012	2.67	2.64	2.3 (58)	6.5 (166)	1.0 (26)	0.9 (0.4)

For coordinating silencers, see page 18, model number 5500A2003 and 5500A3003.

## L-O-X® Sensing Port

L-O-X® Sensing Port - Series 15 manual L-O-X® valves and manual L-O-X® valves with EEZ-ON® operation are now provided with 1/8" NPT sensing ports, enabling installation of a pressure sensing device such as the Pop-Up Indicator or Pressure Switch shown below. Standards suggest that machine design should include a method for verifying the release of energy after lockout.

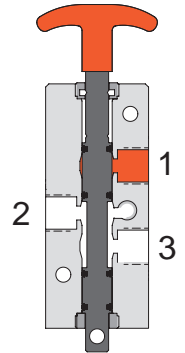
The ROSS 988A30 Pop-Up Indicator is constructed for the industrial environment with a brass body and 1/8" NPT connection. It offers 360° visibility and a redundant verification feature. By pushing on the red plunger, the operator can "feel" the presence of pressure and verify that the indicator is performing its sensing function.

The ROSS 586A86 Pressure Switch offers an electronic pressure sensing option that can be integrated into a safety monitoring system, which confirms energy isolation throughout the circuit.

## VALVE OPERATION

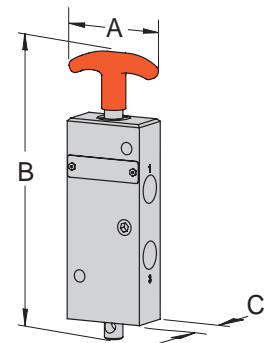
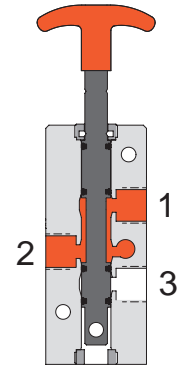
### VALVE CLOSED

When the red handle is pushed inward, the flow of supply air is blocked and downstream air is exhausted via the exhaust port. While servicing or maintaining machinery, the L-O-X® valve should be padlocked in this position to prevent the handle from being pulled outward inadvertently where potential for human injury exists.



### VALVE OPEN

When the red handle is pulled outward supply air flows freely from inlet to outlet and flow to exhaust is blocked. A detent keeps the handle in the open position.



**STANDARD SPECIFICATIONS:** For valves on this page.

**Ambient/Media Temperature:** 40° to 175°F (4° to 80°C).

**Flow Media:** Filtered air; 5 micron recommended.

**Inlet Pressure:** 15 to 145 psig (1.0 to 10.3 bar).

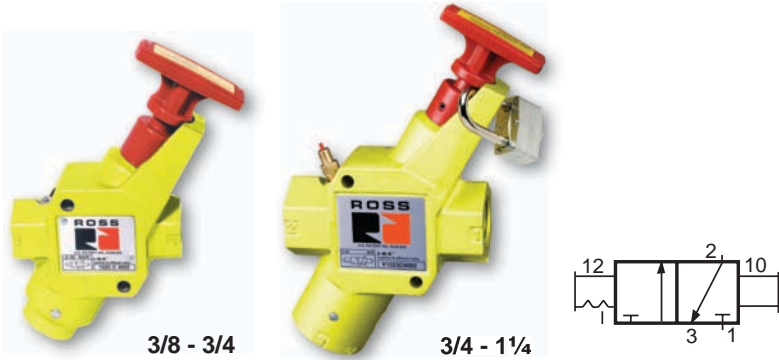
**Port Threads:** NPT standard, BSPP. For BSPP threads, insert a "D" after "Y" to the model number, e.g., YD1523D2002.

**Lock Hole Diameter:** 0.27 inch (7.06 mm).

**Length of Hole:** 0.43 inch (10.92 mm).

**NOTE:** Per specifications and regulations, these products are defined as energy isolation devices, **NOT AS EMERGENCY STOP DEVICES.**

# Series 15 Manual L-O-X® Valves

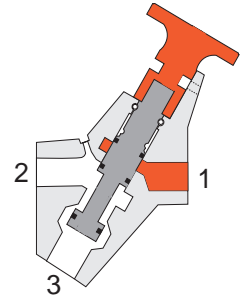


- **Reliable, Low-Cost Control**
- **3/8 to 1 1/4 Ports**

## VALVE OPERATION

### VALVE CLOSED

With a short push of the red handle inward, the flow of supply air is blocked and downstream air is exhausted via the exhaust port at the bottom of the valve. The L-O-X® valve should be padlocked in this position to prevent the handle from being pulled outward inadvertently where potential for human injury exists or while servicing machinery.



Manual L-O-X® valve shown padlocked in closed position. The valve can only be locked in the closed position. The position of the red handle indicates full flow pressurizing or exhausting capability.

Following any FRL components, an energy isolation valve is usually the first valve in the line supplying compressed air to equipment. The energy isolation valve should provide a quick means of shutting off the supply of air and exhausting the downstream lines.

The ROSS manual L-O-X® valve has a large red operating handle for high visibility. When the handle is pulled out, there is full line pressure. A short, full inward push of the handle closes off the flow of air, and quickly exhausts the pressure in the downstream line. This action is swift and doesn't require a difficult, slow, or confusing twisting action.

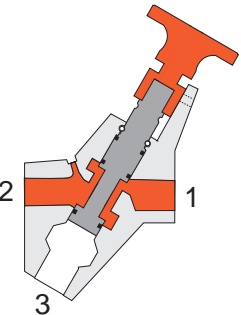
*NOTE: If a system requires gradual buildup of downstream pressure, see L-O-X® valves with EEZ-ON® operation on page 4.*

The controlling spool of the valve employs seals made of very low-friction material. These seals enable the L-O-X® spool to shift smoothly and easily even after being on standby for a long period of time.

The exhaust port is threaded for the installation of a silencer or a line for remote exhausting. Two mounting holes are provided to simplify the installation of the L-O-X® valve.

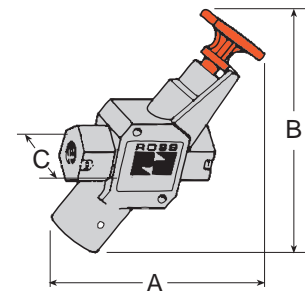
### VALVE OPEN

When the red handle is pulled out, supply air flows freely from inlet to outlet and flow to exhaust is blocked. A detent keeps the handle in the open position. The handle is not designed to be locked in this position, thereby providing for ready shut-off when necessary.



For coordinating silencers, see page 18 (model numbers 5500A5003 and 5500A7013).

Port Size		Valve Model	Avg. Cv		Dimensions inches (mm)			Weight
In-Out	Exh.	Number	1 to 2	2 to 3	A	B	C	lb (kg)
3/8	3/4	Y1523C3002	4.74	3.57	6.4 (163)	8.8 (224)	2.0 (51)	2.0 (0.9)
1/2	3/4	Y1523C4002	7.10	4.00	6.4 (163)	8.8 (224)	2.0 (51)	2.0 (0.9)
3/4	3/4	Y1523C5012	8.26	4.10	6.4 (163)	8.8 (224)	2.0 (51)	2.0 (0.9)
3/4	1 1/4	Y1523C5002	13.12	8.98	7.6 (194)	10.6 (270)	2.3 (57)	3.2 (1.5)
1	1 1/4	Y1523C6002	16.56	9.52	7.6 (194)	10.6 (270)	2.3 (57)	3.2 (1.5)
1 1/4	1 1/4	Y1523C7012	19.25	9.74	7.6 (194)	10.6 (270)	2.3 (57)	3.2 (1.5)



## L-O-X® Sensing Port

L-O-X® Sensing Port - Series 15 manual L-O-X® valves and manual L-O-X® valves with EEZ-ON® operation are now provided with 1/8 NPT sensing ports, enabling installation of a pressure sensing device such as the Pop-Up Indicator or Pressure Switch shown below. Standards suggest that machine design should include a method for verifying the release of energy after lockout.

The ROSS 988A30 Pop-Up Indicator is constructed for the industrial environment with a brass body and 1/8" NPT connection. It offers 360° visibility and a redundant verification feature. By pushing on the red plunger, the operator can "feel" the presence of pressure and verify that the indicator is performing its sensing function.

The ROSS 586A86 Pressure Switch offers an electronic pressure sensing option that can be integrated into a safety monitoring system, which confirms energy isolation throughout the circuit.

## STANDARD SPECIFICATIONS:

**Ambient/Media Temperature:** 40° to 175° F (4° to 80° C).

**Flow Media:** Filtered air; 5 micron filter recommended.

**Inlet Pressure:** 15 to 300 psig (1.0 to 20.1 bar).

**\*Body Paint:** Yellow.

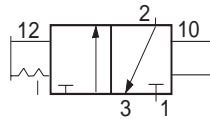
**Port Threads:** NPT standard, BSPP. For BSPP threads, insert a "D" after "Y" to the model number, e.g., YD1523C3002.

Per specifications and regulations, these products are defined as energy isolation devices, **NOT AS EMERGENCY STOP DEVICES.**

# Series 15 Manual L-O-X® Valves



1½ and 2



Manual L-O-X® valve shown padlocked in closed position. The valve can only be locked in the closed position.

Push/pull operation - Push the handle inward to exhaust downstream air (lockable in this position). Pull the handle outward in to supply air downstream.

The ROSS LOX® 1-1/2 and 2 inch port size are the newest addition to ROSS' renowned family of safety-related products. Following any FRL components, an energy isolation valve is usually the first valve in the line supplying compressed air to equipment. The energy isolation valve should provide a quick means of shutting off the supply of air and exhausting the downstream lines.

The ROSS manual L-O-X® valve has a large red operating handle for high visibility. When the handle is pulled out, there is full line pressure. A short, full inward push of the handle closes off the flow of air, and quickly exhausts the pressure in the downstream line. This action is swift and doesn't require a difficult, slow, or confusing twisting action.

*NOTE: If a system requires gradual buildup of downstream pressure, see L-O-X® valves with EEZ-ON® operation on page 4.*

The controlling spool of the valve employs seals made of very low-friction material. These seals enable the L-O-X® spool to shift smoothly and easily even after being on standby for a long period of time.

The exhaust port is threaded for the installation of a silencer or a line for remote exhausting. Two mounting holes are provided to simplify the installation of the L-O-X® valve.

Port Size		Valve Model Number	Avg. Cv		Dimensions inches (mm)			Weight lb (kg)
In-Out	Exh.		1 to 2	2 to 3	A	B	C	
1½	2	Y1523C8002	35.53	50.98	8.2 (209)	14.9 (379)	3.0 (77)	8.2 (3.6)
2	2	Y1523C9012	40.38	52.23	8.2 (209)	14.9 (379)	3.0 (77)	8.2 (3.6)

For coordinating silencers, see page 18, model number 5500A9001.

**NOTE:** Model number 5500B9001 is female threaded as is the exhaust port in the valve. Therefore, a pipe nipple will be needed in order to attach the muffler to the valve.

**CAUTION:** These L-O-X® valves are rated to 20 bar (300 psig), but the mufflers listed above are rated only to 10 bar (150 psig). These mufflers must not be used for applications with pressures greater than 10 bar (150 psig) or serious injury or damage could occur.

## L-O-X® Sensing Port

L-O-X® Sensing Port - Series 15 manual L-O-X® valves and manual L-O-X® valves with EEZ-ON® operation are now provided with 1/8 NPT sensing ports, enabling installation of a pressure sensing device such as the Pop-Up Indicator or Pressure Switch shown below. Standards suggest that machine design should include a method for verifying the release of energy after lockout.

The ROSS 988A30 Pop-Up Indicator is constructed for the industrial environment with a brass body and 1/8" NPT connection. It offers 360° visibility and a redundant verification feature. By pushing on the red plunger, the operator can "feel" the presence of pressure and verify that the indicator is performing its sensing function.

The ROSS 586A86 Pressure Switch offers an electronic pressure sensing option that can be integrated into a safety monitoring system, which confirms energy isolation throughout the circuit.

**STANDARD SPECIFICATIONS:** For valves on this page.

**Ambient/Media Temperature:** 40° to 175°F (4° to 80°C).

**Flow Media:** Filtered air; 5 micron recommended.

**Inlet Pressure:** 15 to 300 psig (1 to 20.1 bar).

**Port Threads:** NPT standard, BSPP. For BSPP threads, insert a "D" after "Y" to the model number, e.g., YD1523C8002.

**Lock Hole Diameter:** 0.38 inch (9.6 mm).

**Length of Hole:** 0.75 inch (19.1 mm).

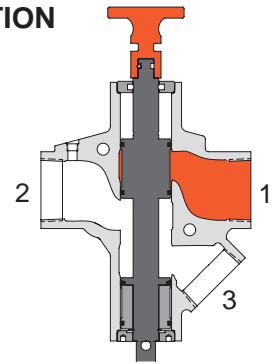
**NOTE:** Per specifications and regulations, these products are defined as energy isolation devices, **NOT AS EMERGENCY STOP DEVICES.**

- Reliable, Low-Cost Control
- 1½ and 2 Ports

## VALVE OPERATION

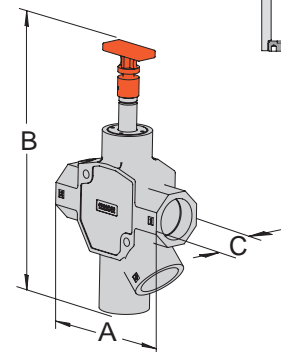
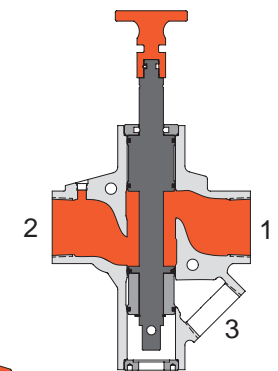
### VALVE CLOSED

With a short push of the red handle inward, the flow of supply air is blocked and downstream air is exhausted via the exhaust port while servicing or maintaining machinery. Padlock the L-O-X® valve in this position to prevent the handle from being pulled outward inadvertently to avoid potential for human injury while servicing machinery.



### VALVE OPEN

When the red handle is pulled out, supply air flows freely from inlet to outlet and flow to exhaust is blocked. A detent keeps the handle in the open position. The handle is not designed to be locked in this position, thereby providing for ready shut-off when necessary.

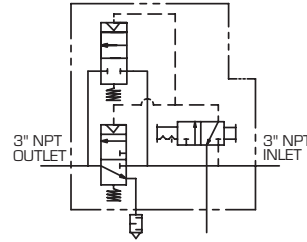


# Series 27 Piloted Valves with L-O-X® Control



3 Inch L-O-X® Valve for Lockout

- **Reliable, Low-Cost Control**
- **3 Inch Port**



Five good reasons to equip your pneumatic systems with our energy isolating L-O-X® valve:

**Effectiveness:** A L-O-X® valve not only isolates the equipment by shutting off air supply, it exhausts stored or residual air immediately from downstream.

**Ease of Use:** Air shutoff is simple; just push in the bright red handle. There's no turning or twisting and guessing whether the valve is completely open.

**Locking protection:** L-O-X® valves are designed to allow secure lock-out upon shutdown, using standard padlocks.

**Reliability:** Special Teflon seals help ensure "shift-ability" even after long periods of non-use.

**Efficiency:** Large exhaust ports provide rapid exhaust of downstream air and are threaded for silencers or remote exhaust lines.

## VALVE MODEL NUMBERS & OVERALL DIMENSIONS

Port Size In-Out	Exhaust	Valve Model Number*	Function	Average Cv		Dimensions inches (mm)			Weight lb (kg)
				1 to 2	2 to 3	A	B	C	
3	2½	Y3900A0829	Manual	140	140	19.6 (496)	25.3 (643)	11.5 (292)	110 (49.9)
3	2½	Y3900A0896	Solenoid	140	140	19.6 (496)	25.3 (643)	14.9 (379)	115 (53.0)

\*NPT threads, standard.

### STANDARD SPECIFICATIONS:

#### For model 3900A0829 (Manual)

**Ambient/Media Temperature:** 40 to 175° F (4 to 80° C).

**Flow Media:** Filtered air; 5 micron filter recommended.

**Inlet Pressure:** 30 to 150 psig (2.1 to 10.3 bar).

**Pilot Pressure:** Must be equal to or greater than inlet pressure.

**Port Threads:** NPT.

#### For model 3900A0896 (Solenoid)

**Solenoids:** AC or DC power.

**Power Consumption:** 87 VA inrush, 30 VA holding on 50 or 60 Hz; 14 watts on DC.

**Ambient Temperature:** 40 to 120° F (4 to 50° C).

**Media Temperature:** 40 to 175° F (4 to 80° C).

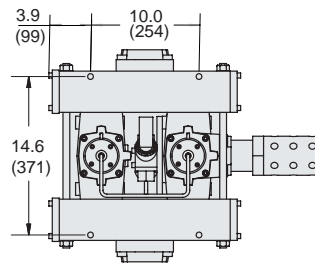
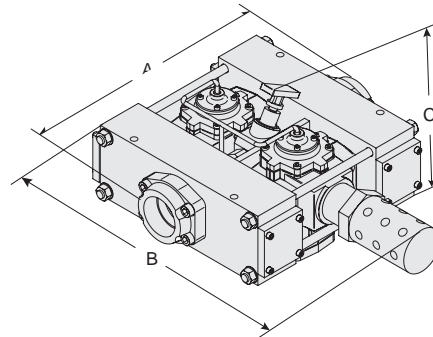
**Flow Media:** Filtered air; 5 micron filter recommended.

**Inlet Pressure:** 30 to 150 psig (2.1 to 10.3 bar).

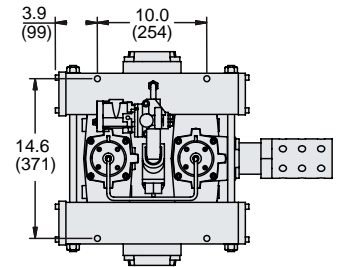
**Pilot Pressure:** Must be equal to or greater than inlet pressure.

**Port Threads:** NPT.

**NOTE:** Per specifications and regulations, these products are defined as energy isolation devices, NOT AS EMERGENCY STOP DEVICES.



Manual Pilot - Model 3900A0829



Solenoid Pilot - Model 3900A0896

## L-O-X® Sensing Port

L-O-X® Sensing Port - Series 15 manual L-O-X® valves and manual L-O-X® valves with EEZ-ON® operation are now provided with 1/8" NPT sensing ports, enabling installation of a pressure sensing device such as the Pop-Up Indicator or Pressure Switch shown below. Standards suggest that machine design should include a method for verifying the release of energy after lockout.

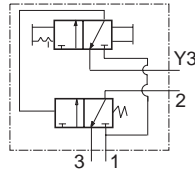
The ROSS 988A30 Pop-Up Indicator is constructed for the industrial environment with a brass body and 1/8" NPT connection. It offers 360° visibility and a redundant verification feature. By pushing on the red plunger, the operator can "feel" the presence of pressure and verify that the indicator is performing its sensing function.

The ROSS 586A86 Pressure Switch offers an electronic pressure sensing option that can be integrated into a safety monitoring system, which confirms energy isolation throughout the circuit.



# Series 27 Manual Piloted Valves with L-O-X® Control

## Port Sizes up to 2½ for Larger Systems



Operated just like the smaller manual L-O-X® valves shown on page 5. The position of the red handle indicates instantaneous full flow pressurizing or exhausting capability.

Following any FRL components, an energy isolation valve is usually the first valve in the line supplying compressed air to equipment. The energy isolation valve should provide a quick means of shutting off the supply of air and exhausting the downstream lines.

The ROSS manual pilot L-O-X® valve has a large red operating handle for high visibility. A short, full inward push of the red operating handle closes off the flow of air, and exhausts the pressure in the downstream line. This action is swift and doesn't require a difficult, slow, or confusing twisting action.

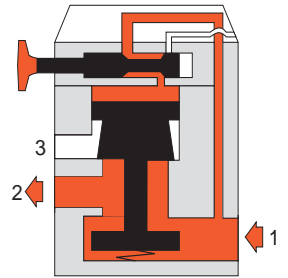
Because of the poppet construction of the main valve body, air pressure provides the forces both to open the valve and to close it. These are large forces so that quick response is ensured even after the valve has been on standby for a long time.

The exhaust port is threaded for the installation of a silencer or a line for remote exhausting.

## VALVE OPERATION

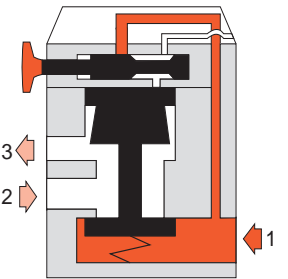
### VALVE OPEN

With the red handle pulled out, pilot air flows to the top of the actuating piston, causing it to open the inlet poppet. Supply air then flows freely from inlet to outlet, and the exhaust port is blocked. A detent keeps the L-O-X® handle in the open position. The handle is designed not to be locked in the open position, thereby allowing for quick shut-off when necessary.



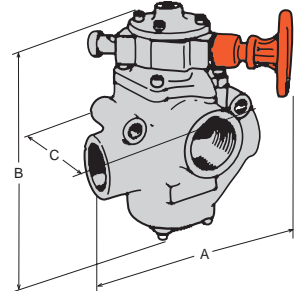
### VALVE CLOSED

With a short push of the red handle inward the flow of supply air is blocked and downstream air is exhausted via the exhaust port. Air pressure on the inlet and exhaust poppets produces a large closing force. The L-O-X® valve should be padlocked in this position to prevent the handle from being pulled outward inadvertently when potential for human injury exists or servicing machinery.



Port Size In-Out Exh.	Valve Model Number*	Avg. Cv		Dimensions inches (mm)			Weight lb (kg)
		1 to 2	2 to 3	A	B	C	
1 1½	Y2783A6006	23.0	34.0	7.4 (187)	8.6 (218)	6.4 (162)	7.0 (3.2)
1¼ 1½	Y2783A7006	30.0	32.0	7.4 (187)	8.6 (218)	6.4 (162)	7.0 (3.2)
1½ 1½	Y2783A8016	30.0	31.0	7.4 (187)	8.6 (218)	6.4 (162)	7.0 (3.2)
1½ 2½	Y2783A8006	68	70	8.4 (213)	10.2 (259)	6.6 (162)	15.3 (6.9)
2 2½	Y2783A9006	70	70	8.4 (213)	10.2 (259)	6.6 (162)	15.3 (6.9)
2½ 2½	Y2783A9016	70	71	8.4 (213)	10.2 (259)	6.6 (162)	15.3 (6.9)

For coordinating silencers, see page 18 (model numbers 5500A8001 and 5500A9002).



## L-O-X® Sensing Port

L-O-X® Sensing Port - Series 15 manual L-O-X® valves and manual L-O-X® valves with EEZ-ON® operation are now provided with 1/8" NPT sensing ports, enabling installation of a pressure sensing device such as the Pop-Up Indicator or Pressure Switch shown below. Standards suggest that machine design should include a method for verifying the release of energy after lockout.

The ROSS 988A30 Pop-Up Indicator is constructed for the industrial environment with a brass body and 1/8" NPT connection. It offers 360° visibility and a redundant verification feature. By pushing on the red plunger, the operator can "feel" the presence of pressure and verify that the indicator is performing its sensing function.

The ROSS 586A86 Pressure Switch offers an electronic pressure sensing option that can be integrated into a safety monitoring system, which confirms energy isolation throughout the circuit.

**STANDARD SPECIFICATIONS:** For valves on this page  
**Ambient/Media Temperature:** 40° to 175°F (4° to 80°C)..  
**Flow Media:** Filtered air; 5 micron recommended.  
**Inlet Pressure:**

Port sizes 1 to 2½: 15 to 150 psig (1.0 to 10.3 bar).

Port sizes 1½ to 2½: 30 to 150 psig (2.1 to 10.3 bar).

**\*Body Paint:** Yellow.

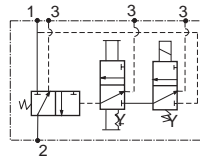
**\*Port Threads:** NPT standard. For BSPP threads, insert a "D" after "Y" to the model number, e.g., YD2783C6006.

**NOTE:** Per specifications and regulations, these products are defined as energy isolation devices, NOT AS EMERGENCY STOP DEVICES.

# Series 27 Solenoid Piloted Valves with L-O-X® Control



## Remote Control in a Full Range of Valve Sizes



The position of the red handle indicates instantaneous full flow pressurizing or exhausting capability.

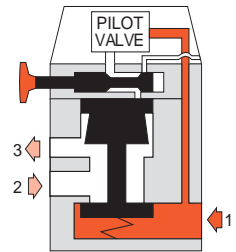
Following any FRL components, an energy isolation valve is usually the first valve in the line supplying compressed air to equipment. The energy isolation valve should provide a quick means of shutting off the supply of air and exhausting the downstream lines.

The shut-off function of the solenoid pilot controlled L-O-X® valve is the same as that of the manual L-O-X® valves. A short, full inward push of the red operating handle closes off the flow of air, and exhausts the pressure in the downstream line. In addition, the solenoid pilot controlled allows the air supply to be turned on or off by remote electrical control whenever the L-O-X® handle is in the outward position. Air flows only if the L-O-X® handle is outward and the solenoid pilot is energized. When the L-O-X® handle is pushed in, air will not flow regardless of the pilot being energized or not. As with all L-O-X® valves, the L-O-X® handle can be padlocked in the closed position. As a further precaution against inadvertent air flow, the solenoid pilot controlled has no manual override. Because of the poppet construction of the main valve body, air pressure provides the forces both to open the valve and to close it. These are large forces so that quick response is ensured even after the valve has been on standby for a long time.

## VALVE OPERATION

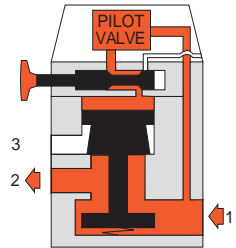
### PILOT DE-ENERGIZED

With the solenoid pilot de-energized (regardless of the position of the L-O-X® handle) the inlet poppet remains closed. The outlet port is connected to the exhaust port so that pressure in the downstream lines is vented to atmosphere.



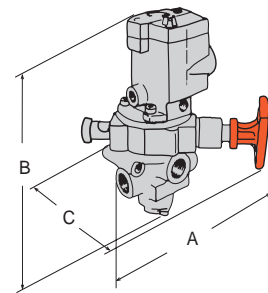
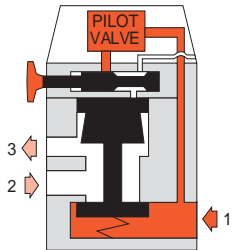
### PILOT ENERGIZED

With the solenoid pilot energized and the L-O-X® control in the open position, air can flow from inlet to outlet port. The exhaust port is closed.



### L-O-X® VALVE CLOSED

With the handle pushed inward, the L-O-X® control is closed, and air to the valve piston is cut off. This allows the inlet poppet to be closed by its spring and the pressure of the inlet air. The outlet is connected to exhaust so downstream pressure is vented.



For coordinating silencers, see page 18 (model numbers 5500A4003, 5500A6003, 5500A8001 and 5500A9002).

Port Size		Valve Model Number*	Avg. Cv		Dimensions inches (mm)			Weight lb (kg)
In-Out	Exh.		1 to 2	2 to 3	A	B	C	
1/4	1/2	Y2773A2072	2.5	3.1	7.1 (181)	8.4 (212)	6.5 (165)	3.5 (1.6)
3/8	1/2	Y2773A3072	3.6	5.3	7.1 (181)	8.4 (212)	6.5 (165)	3.5 (1.6)
1/2	1/2	Y2773A4082	3.3	5.3	7.1 (181)	8.4 (212)	6.5 (165)	3.5 (1.6)
1/2	1	Y2773A4072	6.3	9.2	7.1 (181)	9.0 (228)	6.9 (175)	4.3 (1.9)
3/4	1	Y2773A5072	7.7	11	7.1 (181)	9.0 (228)	6.9 (175)	4.3 (1.9)
1	1	Y2773A6082	8.0	12	7.1 (181)	9.0 (228)	6.9 (175)	4.3 (1.9)
1	1½	Y2773A6072	23	34	8.1 (206)	11.8 (299)	6.9 (175)	8.0 (3.6)
1¼	1½	Y2773A7072	30	32	8.1 (206)	11.8 (299)	6.9 (175)	8.0 (3.6)
1½	1½	Y2773A8082	30	31	8.1 (206)	11.8 (299)	6.9 (175)	8.0 (3.6)
1½	2½	Y2773A8072	68	70	9.3 (235)	13.8 (352)	7.3 (184)	17.5 (7.9)
2	2½	Y2773A9072	70	70	9.3 (235)	13.8 (352)	7.3 (184)	17.5 (7.9)
2½	2½	Y2773A9082	70	71	9.3 (235)	13.8 (352)	7.3 (184)	17.5 (7.9)

## L-O-X® Sensing Port

L-O-X® Sensing Port - Series 15 manual L-O-X® valves and manual L-O-X® valves with EEZ-ON® operation are now provided with 1/8 NPT sensing ports, enabling installation of a pressure sensing device such as the Pop-Up Indicator or Pressure Switch shown below. Standards suggest that machine design should include a method for verifying the release of energy after lockout.

The ROSS 988A30 Pop-Up Indicator is constructed for the industrial environment with a brass body and 1/8" NPT connection. It offers 360° visibility and a redundant verification feature. By pushing on the red plunger, the operator can "feel" the presence of pressure and verify that the indicator is performing its sensing function.

The ROSS 586A86 Pressure Switch offers an electronic pressure sensing option that can be integrated into a safety monitoring system, which confirms energy isolation throughout the circuit.

**STANDARD SPECIFICATIONS:** For valves on this page.

**Ambient Temperature:** 40° to 120°F (4° to 50°C).

**Media Temperature:** 40° to 175°F (4° to 80°C).

**Flow Media:** Filtered air; 5 micron recommended.

**Inlet Pressure:** Port sizes 1/4 to 1½: 15 to 150 psig (1.0 to 10.3 bar).  
Port sizes 1½ to 2½: 30 to 150 psig (2.1 to 10.3 bar).

**\*Body Paint:** Yellow.

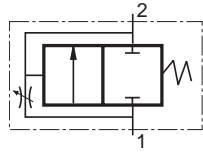
**\*Port Threads:** NPT standard. For BSPP threads, insert a "D" after "Y" to the model number, e.g. YD2773A2072.

**NOTE:** Per specifications and regulations, these products are defined as energy isolation devices, NOT AS EMERGENCY STOP DEVICES.

# Series 27 EEZ-ON® Valves

## A Gradual Start-up for Pneumatic Circuits

### 2/2 EEZ-ON® Valves



The EEZ-ON® valve is designed to allow a gradual buildup of downstream air pressure before opening to full air flow. This gradual pressure buildup allows cylinders and other work elements to move slowly and more safely into their normal working positions before full line pressure is applied. An adjustable restriction within the EEZ-ON® valve determines the rate of downstream pressure buildup, and consequently the time delay for the full opening of the EEZ-ON® valve.

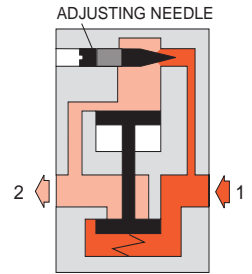
For added safety, the EEZ-ON® valve can be used in conjunction with the L-O-X® valve (see preceding pages) to provide a lockout and exhaust feature. The L-O-X® valve and EEZ-ON® valve can even be used in one combined unit (see L-O-X® valves with EEZ-ON® operation, pages 4 & 13).



#### VALVE OPERATION

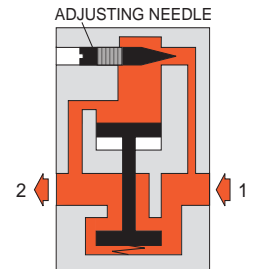
##### AIR PRESSURE TO INLET

When air pressure is first applied to the inlet, air flow to the piston is restricted by the adjustable needle in the delay orifice. Downstream air pressure gradually builds up at a rate determined by the setting of the adjustable needle.



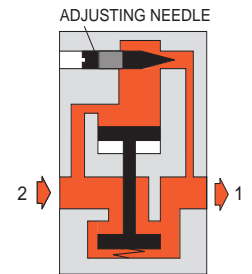
##### VALVE OPENS TO FULL FLOW

When downstream air pressure reaches approximately 40 to 60 percent of inlet pressure, the valve element shifts to the full open position and there is full air flow to the downstream components. This condition continues as long as inlet air pressure is present.

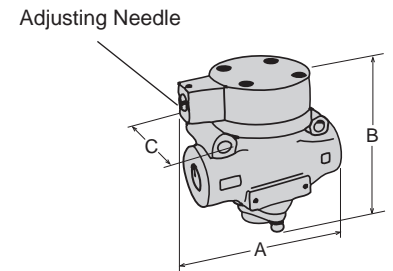


##### INLET PRESSURE REMOVED

When inlet pressure is removed, the exhausting downstream air pressure keeps the inlet poppet open until the downstream pressure drops by approximately 90 percent. The remaining pressure is exhausted via the delay orifice.



Port Size	Valve Model Numbers*	Avg. Cv	Dimensions inches (mm)			Weight lb (kg)
			A	B	C	
1/4	2781A2007	2.3	3.8 (97)	3.8 (97)	3.0 (77)	1.5 (0.7)
3/8	2781A3007	3.8	3.8 (97)	3.8 (97)	3.0 (77)	1.5 (0.7)
1/2	2781A4017	4.0	3.8 (97)	3.8 (97)	3.0 (77)	1.5 (0.7)
1/2	2781A4007	13.0	4.6 (117)	4.5 (114)	3.0 (77)	2.3 (1.0)
3/4	2781A5007	15.0	4.6 (117)	4.5 (114)	3.0 (77)	2.3 (1.0)
1	2781A6017	16.0	4.6 (117)	4.5 (114)	3.0 (77)	2.3 (1.0)
1	2781A6007	24.0	6.6 (168)	7.6 (192)	4.1 (103)	6.0 (2.7)
1¼	2781A7007	29.0	6.6 (168)	7.6 (192)	4.1 (103)	6.0 (2.7)
1½	2781A8017	29.0	6.6 (168)	7.6 (192)	4.1 (103)	6.0 (2.7)



**STANDARD SPECIFICATIONS:** For valves on this page.  
**Ambient/Media Temperature:** 40° to 175°F (4° to 80°C).  
**Flow Media:** Filtered air; 5 micron recommended.  
**Inlet Pressure:** 30 to 150 psig (2.1 to 10.3 bar).

**\*Body Paint:** Gold.

**\*Port Threads:** NPT standard, BSPP. For BSPP threads, add a "D" prefix to the model number, e.g. D2781A2007.

# Series 27 EEZ-ON® Valves

## Gradual Start-up plus Pressure Controlled and Line Exhaust

### 3/2 EEZ-ON® Valves



Internal Pressure Controlled



Solenoid Pilot Controlled

The 3/2 EEZ-ON® valve provides the same gradual pressure buildup as the 2/2 EEZ-ON® valves described on page 11. In addition, the 3/2 valve has an exhaust port so that downstream air is exhausted when the valve is de-energized.

**STANDARD SPECIFICATIONS:** For valves on this page.  
**Ambient/Media Temperature:** 40° to 175°F (4° to 80°C).  
**Power Consumption:** 87 VA holding on 50 or 60 Hz; 14 watts on DC.

**Flow Media:** Filtered air; 5 micron recommended.

**Inlet Pressure:** 15 to 150 psig (1.0 to 10.3 bar).

**\*Body Paint:** Gold.

**\*Port Threads:** NPT standard, BSPP. For BSPP threads, add a "D" prefix to the model number, e.g., D2773B2037.

### VALVE OPERATION

#### PILOT NOT ENERGIZED

Pilot air is blocked by the pilot. Any downstream pressure forces piston B (which slides on the valve stem) upward. This opens the exhaust port and vents the downstream line.

#### PILOT ENERGIZED

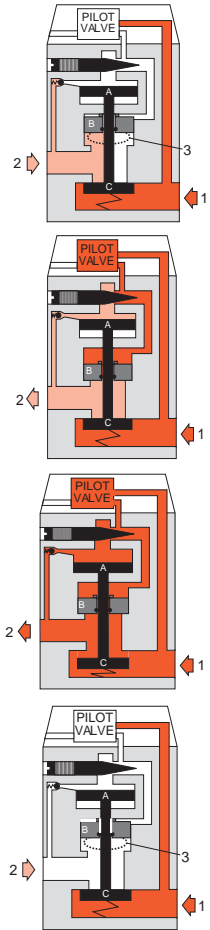
Pilot air forces piston B downward to close the exhaust port. Pilot air also flows past the adjusting needle, opens the ball check and begins slowly to pressurize the outlet line. At the same time, pressure is building up on piston A.

#### FULL PRESSURE

When the pressure on piston A reaches approximately 50 percent of inlet pressure, it is forced downward and opens inlet poppet C. Full inlet pressure now flows freely to the outlet port.

#### PILOT DE-ENERGIZED

Air above pistons A and B is exhausted through the exhaust port of the pilot valve. Air above poppet C forces sliding piston B upward so that the main exhaust port is opened and the pressurized air is exhausted.

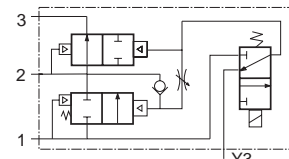


Port Size In-Out Exh.	Valve Model Number*	Avg. Cv		Dimensions inches (mm)			Weight lb (kg)
		1 to 2	2 to 3	A	B	C	
<b>Solenoid Pilot Controlled</b>							
1/4 1/2	2773B2037	2.5	3.1	4.1 (105)	8.8 (224)	3.1 (79)	4.5 (2.0)
3/8 1/2	2773B3037	3.6	5.3	4.1 (105)	8.8 (224)	3.1 (79)	4.5 (2.0)
1/2 1/2	2773B4047	3.3	5.3	4.1 (105)	8.8 (224)	3.1 (79)	4.5 (2.0)
1/2 1	2773B4037	10.0	13.0	4.9 (124)	9.6 (243)	3.6 (92)	5.0 (2.3)
3/4 1	2773B5037	12.0	15.0	4.9 (124)	9.6 (243)	3.6 (92)	5.0 (2.3)
1 1	2773B6047	12.0	16.0	4.9 (124)	9.6 (243)	3.6 (92)	5.0 (2.3)
1 1½	2773B6037	23.0	34.0	6.6 (168)	10.6 (268)	4.8 (123)	8.8 (4.0)
1¼ 1½	2773B7037	30.0	32.0	6.6 (168)	10.6 (268)	4.8 (123)	8.8 (4.0)
1½ 1½	2773B8047	30.0	31.0	6.6 (168)	10.6 (268)	4.8 (123)	8.8 (4.0)
<b>Internal Pressure Controlled</b>							
1/4 1/2	2783C2037	2.5	3.1	4.1 (105)	5.7 (146)	3.1 (79)	4.5 (2.0)
3/8 1/2	2783C3037	3.6	5.3	4.1 (105)	5.7 (146)	3.1 (79)	4.5 (2.0)
1/2 1/2	2783C4047	3.3	5.3	4.1 (105)	5.7 (146)	3.1 (79)	4.5 (2.0)
1/2 1	2783C4037	10.0	13.0	4.9 (124)	7.1 (180)	3.6 (92)	5.0 (2.3)
3/4 1	2783C5037	12.0	15.0	4.9 (124)	7.1 (180)	3.6 (92)	5.0 (2.3)
1 1	2783C6047	12.0	16.0	4.9 (124)	7.1 (180)	3.6 (92)	5.0 (2.3)
1 1½	2783B6037	23.0	34.0	6.6 (168)	7.4 (188)	4.8 (123)	8.8 (4.0)
1¼ 1½	2783B7037	30.0	32.0	6.6 (168)	7.4 (188)	4.8 (123)	8.8 (4.0)
1½ 1½	2783B8047	30.0	31.0	6.6 (168)	7.4 (188)	4.8 (123)	8.8 (4.0)

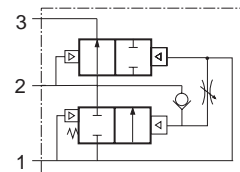
For coordinating silencers, see page 18 (model numbers 5500A4003, 5500A6003, and 5500A8001).

The 3/2 EEZ-ON® valve provides the same gradual pressure buildup as the 2/2 EEZ-ON® valves described above. In addition, the 3/2 valve has an exhaust port so that downstream air is exhausted when the valve is de-energized. At the same time, supply air is positively shut off so that a separate shut-off valve is not required.

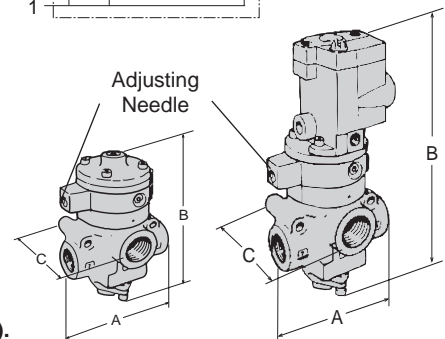
**NOTE:** The 3/2 EEZ-ON® valve is also available with a L-O-X® adapter so that both L-O-X® and EEZ-ON® functions are consolidated in a single valve.



Solenoid Pilot Controlled



Internal Pressure Controlled



# Series 27 Manual L-O-X® Valves with EEZ-ON® Operation



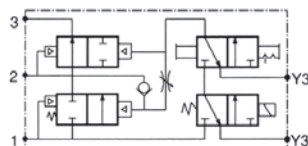
Internal Pressure Controlled



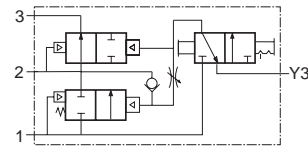
Solenoid Pilot Controlled

These unique valves give pneumatic circuits the soft start-up of the EEZ-ON® valves plus the lockout and exhaust capabilities of L-O-X® valves. They are available with either solenoid or air pilots.

**Blue handle indicates that EEZ-ON® function is included (L-O-X® valves with red handles do not have the EEZ-ON® function).**



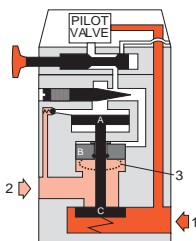
Solenoid Pilot Controlled



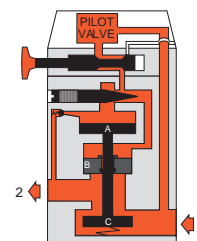
Internal Pressure Controlled

## VALVE OPERATION

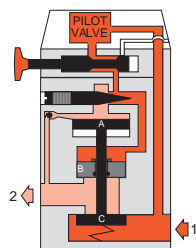
**L-O-X® handle open and pilot not energized.** Pilot air is blocked by the pilot. Any downstream pressure forces piston B (which slides on the valve stem) upward. This opens the exhaust port and vents the downstream line.



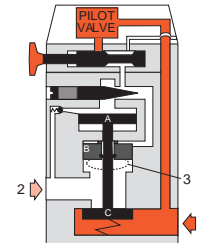
**Full Pressure.** When the pressure on piston A reaches approximately 50 percent of inlet pressure, it is forced downward and opens inlet poppet C. Full inlet pressure now flows freely to the outlet port.



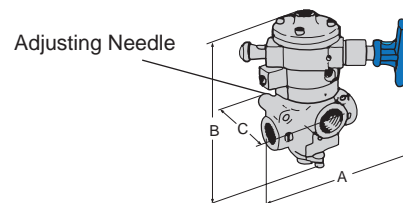
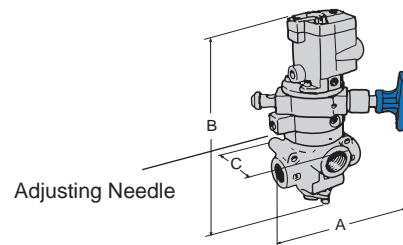
**L-O-X® handle closed and pilot energized.** Pilot air forces piston B downward to close the exhaust port. Pilot air also flows past the adjusting needle, opens the ball check and begins slowly to pressurize the outlet line. At the same time, pressure is building up on piston A.



**L-O-X® handle closed.** At any time the L-O-X® handle can be pushed inward, thereby closing off the flow of pilot air. Pilot air above pistons A and B is then vented to atmosphere. Piston A moves upward and closes inlet poppet C. Sliding piston B also moves upward to open the exhaust port and vents the downstream line.



Port Size In-Out	Exh.	Valve Model Number*	Avg. Cv		Dimensions inches (mm)			Weight lb (kg)
			1 to 2	2 to 3	A	B	C	
<b>Solenoid Pilot Controlled</b>								
1/4	1/2	Y2773B2075	2.5	3.1	7.1 (181)	9.9 (253)	6.5 (165)	5.3 (2.4)
3/8	1/2	Y2773B3075	3.6	5.3	7.1 (181)	9.9 (253)	6.5 (165)	5.3 (2.4)
1/2	1/2	Y2773B4085	3.3	5.3	7.1 (181)	9.9 (253)	6.5 (165)	5.3 (2.4)
1/2	1	Y2773B4075	10.0	13.0	7.1 (181)	10.6 (269)	6.9 (175)	6.0 (2.7)
3/4	1	Y2773B5075	12.0	15.0	7.1 (181)	10.6 (269)	6.9 (175)	6.0 (2.7)
1	1	Y2773B6085	12.0	16.0	7.1 (181)	10.6 (269)	6.9 (175)	6.0 (2.7)
1	1½	Y2773B6075	23.0	34.0	7.4 (188)	11.6 (296)	6.9 (175)	9.5 (4.3)
1¼	1½	Y2773B7075	30.0	32.0	7.4 (188)	11.6 (296)	6.9 (175)	9.5 (4.3)
1½	1½	Y2773B8085	30.0	31.0	7.4 (188)	11.6 (296)	6.9 (175)	9.5 (4.3)
<b>Internal Pressure Controlled</b>								
1	1½	Y2783A6055	23.0	34.0	7.4 (188)	11.6 (296)	6.9 (175)	9.5 (4.3)
1¼	1½	Y2783A7055	30.0	32.0	7.4 (188)	11.6 (296)	6.9 (175)	9.5 (4.3)
1½	1½	Y2783A8065	30.0	31.0	7.4 (188)	11.6 (296)	6.9 (175)	9.5 (4.3)



For coordinating silencers, see page 18 (model numbers 5500A4003, 5500A6003, 5500A8001 and 5500A9002).

### STANDARD SPECIFICATIONS:

**Solenoid Pilot Ambient Temperature:** 40° to 120°F (4° to 50° C).

**Media Temperature:** 40° to 175°F (4° to 80° C).

**Internal Air Pilot Ambient/Media Temperature:**

40° to 175°F (4° to 80° C).

**Flow Media:** Filtered air; 5 micron filter recommended.

**Inlet Pressure:** 42 to 150 psig (2.9 to 10.3 bar).

**\*Body Paint:** Yellow.

**\*Port Threads:** NPT standard, BSPP. For BSPP threads, insert a "D" after "Y" to the model number, e.g., YD2773B2075.

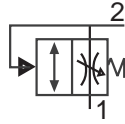
**NOTE:** Per specifications and regulations, these products are defined as energy isolation devices, **NOT AS EMERGENCY STOP DEVICES.**

# Right-Angle EEZ-ON® Valves

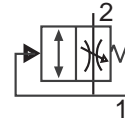
## Port Mounted 2-way Normally Closed EEZ-ON®



EEZ-ON® Valves are used to gradually apply air pressure downstream when supply is initially applied. Select the model you need to operate with supply pressure at either port 1 or port 2. Right-angle design with Banjo for easy positioning of pipe or tubing.

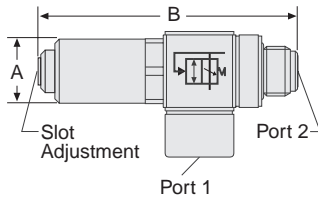


Primary Pressure at port 1



Primary Pressure at port 2

### Models with Threaded Banjo



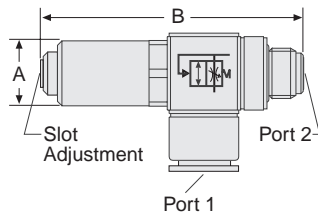
Threaded Banjo

Port Size	Port 1* Port 2**	Valve Model Numbers		Avg. C <sub>v</sub>	Dimensions inches (mm)		Tightening Torque Max. Ft-lb (Nm)
		Primary Pressure At Port 1	Primary Pressure At Port 2		A	B	
1/8	1/8	1969A1010	1969A1011	0.7	0.5 (13)	2.3 (57)	11.06 (15)
1/4	1/4	1969A2010	1969A2011	1.1	0.7 (17)	2.5 (63)	14.75 (20)
3/8	3/8	1969A3010	1969A3011	1.9	0.9 (22)	2.5 (63)	22.13 (30)
1/2	1/2	1969A4010	1969A4011	2.2	1.1 (27)	2.9 (74)	29.50 (40)
G1/8	G1/8	D1969A1010	D1969A1011	0.7	0.5 (13)	2.3 (57)	7.38 (10)
G1/4	G1/4	D1969A2010	D1969A2011	1.1	0.7 (17)	2.4 (61)	8.85 (12)
G3/8	G3/8	D1969A3010	D1969A3011	1.9	0.9 (22)	2.7 (67)	14.75 (20)
G1/2	G1/2	D1969A4010	D1969A4011	2.2	1.1 (27)	2.9 (72)	22.13 (30)

\* Threads in port 1 are female.

\*\* Port 2 threads are male.

### Models with Push-to-Connect Fitting



Push-to-Connect Fitting

Port Size (tube size)	Port 2** (thread size)	Valve Model Numbers		Avg. C <sub>v</sub>	Dimensions inches (mm)		Tightening Torque Max. Ft-lb (Nm)
		Primary Pressure At Port 1	Primary Pressure At Port 2		A	B	
5/32"	1/8	1969A1020	1969A1021	0.5	0.5 (13)	2.3 (57)	11.06 (15)
1/4"	1/8	1969A1030	1969A1031	0.5	0.5 (13)	2.3 (57)	11.06 (15)
1/4"	1/4	1969A2020	1969A2021	0.6	0.7 (17)	2.5 (63)	14.75 (20)
3/8"	1/4	1969A2030	1969A2031	0.6	0.7 (17)	2.5 (63)	14.75 (20)
3/8"	3/8	1969A3020	1969A3021	1.5	0.9 (22)	2.8 (69)	22.13 (30)
4 mm	G1/8	D1969A1020	D1969A1021	0.5	0.5 (13)	2.3 (57)	7.38 (10)
6 mm	G1/8	D1969A1030	D1969A1031	0.5	0.5 (13)	2.3 (57)	7.38 (10)
8 mm	G1/8	D1969A1040	D1969A1041	0.5	0.5 (13)	2.3 (57)	7.38 (10)
6 mm	G1/4	D1969A2020	D1969A2021	0.6	0.7 (17)	2.4 (61)	8.85 (12)
8 mm	G1/4	D1969A2030	D1969A2031	0.6	0.7 (17)	2.4 (61)	8.85 (12)
10 mm	G1/4	D1969A2040	D1969A2041	0.6	0.7 (17)	2.4 (61)	8.85 (12)
8 mm	G3/8	D1969A3020	D1969A3021	1.5	0.9 (22)	2.7 (67)	14.75 (20)
10 mm	G3/8	D1969A3030	D1969A3031	1.5	0.9 (22)	2.7 (67)	14.75 (20)

# Port 1 tubing size in inches (") or millimeters (mm).

\*\* Port 2 threads are male.

**STANDARD SPECIFICATIONS:** For valves on this page.  
**Ambient/Media Temperature:** 15° to 160°F (-10° to 70°C).  
**Flow Media:** Filtered air; 5 micron recommended.  
**Operating Pressure:** 45 to 150 psig (3.1 to 10.3 bar).

# Modular L-O-X®

# Air Entry Combination Lockout Valve with Integrated Filter/Regulator

**Ports: 1/4, 3/8, 1/2**  
**Flow to 105 scfm**



The Modular L-O-X® Air Entry is a combination Lockout Valve with Integrated Filter/Regulator in a high flow, compact space saving design. Full flow exhaust meets all the applicable standards.

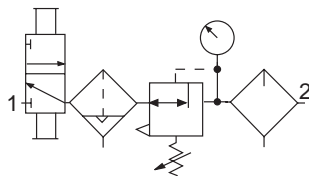
### FEATURES:

- Filter and regulator consolidated into a single space-saving assembly
- Modular mounting for easy servicing
- Internal automatic drain; optional manual drain or float drain (metal bowl only)
- Reverse flow, self-relieving piston-type regulator; non-relieving optional
- Tamper-resistant pressure setting
- Has a visible indicator of pressure release (verification port)
- Only lockable in the off position
- Has a full size exhaust port (equal to or larger than supply)
- Easy to operate (positive push/pull operation-detented)
- Optional EEZ-ON® operation available.

### APPLICATIONS:

- Packaging • Material handling • Conveyor panels • All Air Entry points

**Lockout/Filter/Regulator  
ISO Symbol**  
Lockout  
Automatic Drain  
Self-relieving



## HOW TO ORDER

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

<b>MD3</b>	<b>53P</b>	<b>B</b>	<b>A</b>	<b>B</b>	<b>5</b>	<b>B</b>	<b>B</b>	<b>-</b>	
<b>BOWL SIZE</b>	<b>ELEMENT TYPE</b>	<b>BOWL DRAIN</b>	<b>PIPE SIZE</b>	<b>GAUGE</b>	<b>ADJUSTMENT RANGE</b>	<b>ADD ON L-O-X®</b>			
53P - Polycarbonate Bowl (4 oz) 53M - Metal Bowl with sight gauge (6 oz)	A - 40 Micron B - 5 Micron; standard	A - Auto Drain/Differential Pressure M - Manual Drain F - Float Drain (metal bowl only)	2 - 1/4 NPTF 3 - 3/8 NPTF 4 - 1/2 NPTF C - 1/4 BSPP D - 3/8 BSPP E - 1/2 BSPP	A - No Gauge B - (0-200 psig) C - (0-60 psig) D - No Gauge with Panel Mount Nut E - (0-200 psig) Gauge with Panel Mount Nut F - (0-60 psig) Gauge with Panel Mount Nut	A - 0-150 psig (0-10 bar); reverse flow B - 0-100 psig (0-6.8 bar); standard, reverse flow C - 0-50 psig (0-3.4 bar); reverse flow	1 - Outlet Side 2 - Inlet Side 3 - L-O-X® with EEZ-ON® on Outlet Side 4 - L-O-X® with EEZ-ON® on Inlet Side X - no L-O-X®			

**STANDARD SPECIFICATIONS:** For valves on this page.

#### Ambient/Media Temperature:

Plastic or Metal bowl: 40° to 125°F (4° to 52°C).

**Body:** Zinc.

**Bonnet:** Acetal.

**Bowl:** 4-oz (120-ml) polycarbonate plastic with zinc shatterguard; optional zinc bowl with clear nylon sight glass (6-oz).

**Bowl Drain:** Internal automatic drain; optional manual drain or float drain (metal bowl only).

**Cap Color:** Black.

**Filter Element:** 5-micron rated polyethylene filter element; optional 40-micron element.

**Fluid Media:** Compressed air.

**Inlet Pressure:** 15 psig (1.0 bar) minimum with automatic drain.

**Plastic bowl:** 150 psig (10.3 bar).

**Metal bowl:** 200 psig (13.8 bar).

**Outlet Pressure:** Adjustable up to 150 psig (10.3 bar); optional adjusting springs.

**Pressure Adjustment:** Removable, knob.

**Pressure Gauge:** 0 to 200 psig (0 to 13.8 bar); 1/4 NPT gauge ports front and rear; 0 to 60 psig (0 to 4 bar) optional.

**Panel Mounting:** 1.56 inch (37.1 mm) hole required.

**Ports:** Tapped inlet, outlet and exhaust ports.

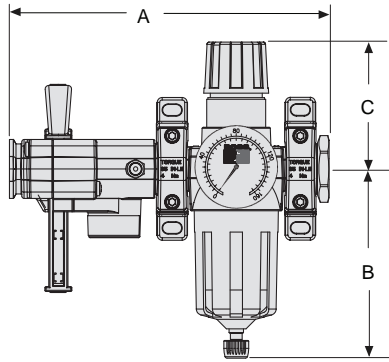
**Seals/Elastomers:** Nitrile.

**Valve:** Brass.

**Valve Color:** Yellow body, red lockout slide.

**Slide:** Acetal.

**Threads:** NPT standard, BSPP.

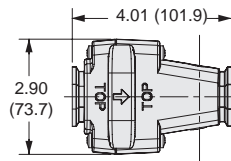


### DIMENSIONS inches (mm)

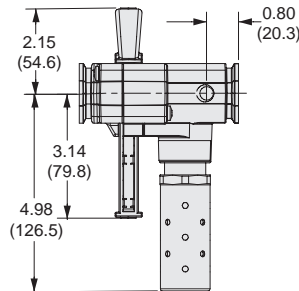
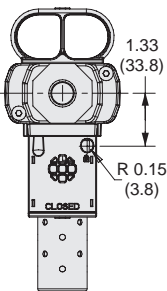
Bowl	A	B *	C **	Depth †	Weight † lb (kg)
Polycarbonate	7.7 (195.6)	4.81 (122.2)	3.23 (82.0)	2.9 (73.7)	3.12 (1.4)
Metal	7.7 (195.6)	6.43 (163.4)	3.23 (82.0)	2.9 (73.7)	3.18 (1.4)

\* Bowl removal clearance: add 3.1 (79).  
 \*\* Dome removal clearance: add 0.63 (16).  
 † Less gauge.

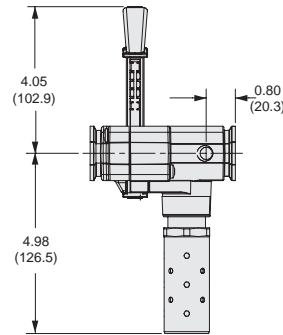
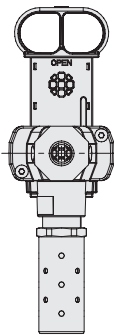
Top View



Valve in Closed Position



Valve in Open Position

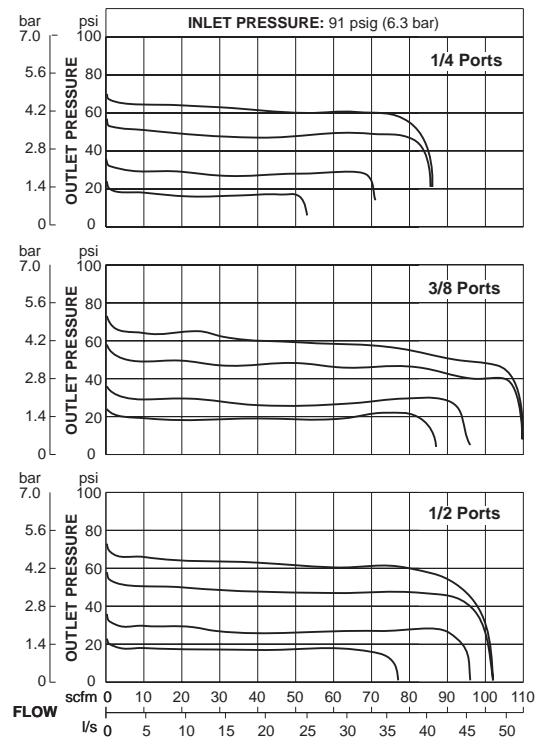


### REPLACEMENT FILTER ELEMENT KITS

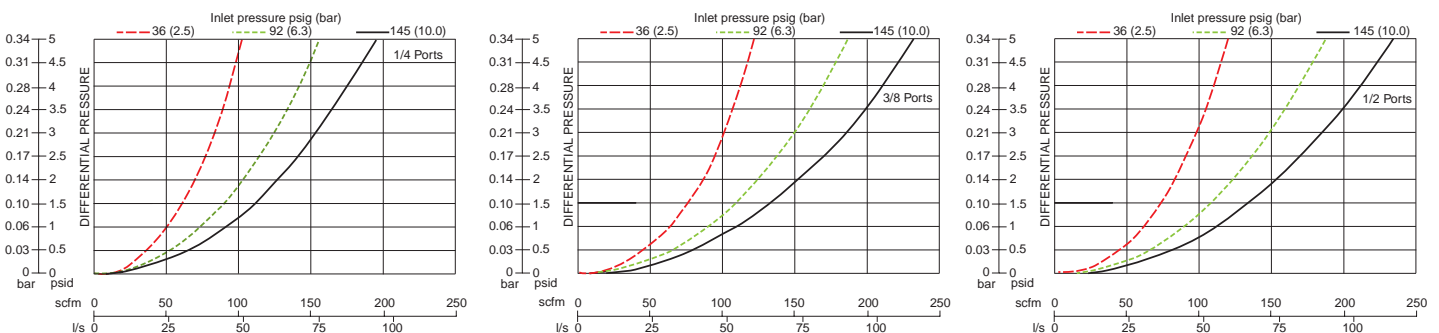
Element Rating	Kit Number
5-µm (Std. element)	936K77
40-µm	938K77

Accessories not included with the product, see accessories page 18-19 for ordering information.

### FILTER/REGULATOR FLOW CHARACTERISTICS

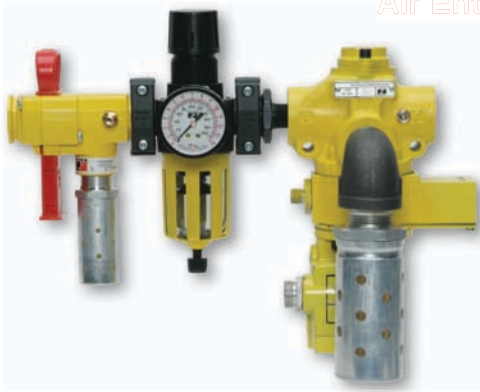


### LOCKOUT VALVE FLOW CHARACTERISTICS





## Air Entry Packages with 3/2 Normally Closed Sensing Valve



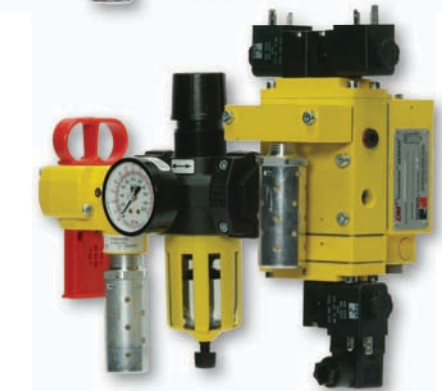
- Pre-engineered panel-mounted design with air entry via filter and regulator “FR”, or filter, regulator, and lubricator “FRL”. Includes 3/2 Normally Closed Sensing Valve which senses poppet position and state. Electrical feedback via DPST switch (Double-Pole Single-Throw).
- Applications include Air Dump and Trapped-Pressure Release.

## Air Entry Packages with Control Reliable Energy Isolation



- Pre-engineered panel-mounted design with air entry via a filter and regulator “FR”, or filter, regulator and lubricator “FRL”.
- Includes DM<sup>1</sup> Series E Double Valve with Monitoring:
  - a) Self-contained dynamic monitoring system requires no further valve monitoring controls,
  - b) Ready-to-run: If an abnormality clears itself upon the removal of electricity to both solenoids, it will be ready-to-run again. It does not remember the abnormality & stay in a locked-out state until intentionally reset. Therefore, cumulative abnormalities may go undetected,
  - c) Status indicator switch for valve condition (ready-to-run) feedback.

**Do not use in power press clutch/brake applications.**



- Pre-engineered panel-mounted design with air entry via a filter and regulator “FR”, or filter, regulator and lubricator “FRL”.
- Includes DM<sup>2</sup> Series E Double Valve with Monitoring & Memory:
  - a) Self-contained dynamic monitoring system requires no further valve monitoring controls,
  - b) Dynamic memory of abnormal function prevents unintentional reset with removal of air or electricity.
- All necessary features for safety applications are included:
  - a) Electrical reset valve,
  - b) Status indicator switch for valve condition (ready-to-run) feedback.

**Do not use in power press clutch/brake applications.**

	Model Number*	Air Entry Type	Port Size		C <sub>v</sub>		Dimensions (inches/mm)		
			In-Out	Exh.	1 to 2	2 to 3	Length	Width	Depth
Cat-2 with SV27	RC208-09	FR	1/2	1	6.3	9.2	14.80 (374.9)	11.00 (279.0)	6.60 (167.7)
Cat-2 with SV27	RC208L-09	FRL	1/2	1	6.3	9.2	14.80 (374.9)	11.00 (279.0)	6.60 (167.7)
Cat-3 with DM <sup>1</sup> Series E	RC304-09	FR	1/4	1/2	1.3	2.4	13.00 (330.0)	11.00 (279.0)	5.40 (134.7)
Cat-3 with DM <sup>1</sup> Series E	RC306-09	FR	3/8	1/2	1.9	2.4	13.00 (330.0)	11.00 (279.0)	5.40 (134.7)
Cat-3 with DM <sup>1</sup> Series E	RC304L-09	FRL	1/4	1/2	1.3	2.4	13.00 (330.0)	11.00 (279.0)	5.40 (134.7)
Cat-3 with DM <sup>1</sup> Series E	RC306L-09	FRL	3/8	1/2	1.9	2.4	13.00 (330.0)	11.00 (279.0)	5.40 (134.7)
Cat-4 with DM <sup>2</sup> Series E	RC404-09	FR	1/4	1/2	1.3	2.4	13.00 (330.0)	11.00 (279.0)	5.40 (134.7)
Cat-4 with DM <sup>2</sup> Series E	RC406-09	FR	3/8	1/2	1.9	2.4	13.00 (330.0)	11.00 (279.0)	5.40 (134.7)
Cat-4 with DM <sup>2</sup> Series E	RC404L-09	FRL	1/4	1/2	1.3	2.4	13.00 (330.0)	11.00 (279.0)	5.40 (134.7)
Cat-4 with DM <sup>2</sup> Series E	RC406L-09	FRL	3/8	1/2	1.9	2.4	13.00 (330.0)	11.00 (279.0)	5.40 (134.7)

\* NPT port threads. Specify voltage and hertz when ordering. The standard Air Entry Packages are supplied with metal bowl and manual drain, for auto drain insert an “A” before the dash (-) in the model number, e.g., RC208A-09.

# Accessories

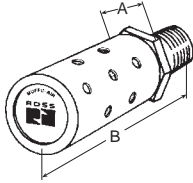
## Muffl-Air® Silencers

ROSS MUFFL-AIR® silencers substantially reduce exhaust noise levels yet produce little back pressure. Typical impact noise reduction is in the 20–25 dB range.

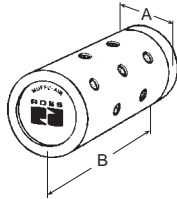
**Pressure Range:** 150 psig (10 bar) maximum.



MUFFL-AIR® Silencer  
male threads illustrated



**Male Pipe Threads**  
For ports 1/8 through 1¼



**Female Pipe Threads**  
For ports 1¼ through 2½

Port Size	NPT Threads	Model Numbers	Avg. C <sub>v</sub>	Dimensions inches (mm)		Weight lb (kg)
				A	B	
1/8	Male	5500A1003	2.0	0.8 (21)	2.2 (56)	0.3 (0.1)
1/4	Male	5500A2003	2.0	0.8 (21)	2.2 (56)	0.3 (0.1)
3/8	Male	5500A3013	2.0	0.8 (21)	2.2 (56)	0.3 (0.1)
3/8	Male	5500A3003	5.7	1.3 (32)	3.8 (96)	0.5 (0.2)
1/2	Male	5500A4003	7.0	1.3 (32)	3.8 (96)	0.5 (0.2)
3/4	Male	5500A5013	7.0	1.3 (32)	3.8 (96)	0.5 (0.2)
3/4	Male	5500A5003	15	2.0 (51)	5.6 (142)	1.5 (0.7)
1	Male	5500A6003	18	2.0 (51)	5.6 (142)	1.5 (0.7)
1¼	Male	5500A7013	18	2.0 (51)	5.6 (142)	1.5 (0.7)
1¼	Female	5500A7001	37	2.5 (64)	5.9 (149)	2.3 (1.0)
1½	Female	5500A8001	38	2.5 (64)	5.9 (149)	2.3 (1.0)
2	Female	5500B9001	50	3.0 (77)	7.3 (185)	3.5 (1.6)
2½	Female	5500A9002	65	4.0 (102)	6.9 (173)	3.5 (1.6)

\* NPT port threads. For BSPP threads, add a "D" prefix to the model number.

**Pressure Range:** 150 psig (10 bar) maximum.

## Multiple Lock-out Device

For use with any ROSS model with L-O-X® capability.

Model Numbers	Dimensions inches (mm)			Weight lb (kg)
	Width	Length	Thickness	
356A30	3.0 (1.4)	3.0 (1.4)	0.4 (.18)	0.3 (0.1)



## Pneumatic Energy Release Verification Options

### Visual Pop-Up Indicator or Pressure Switch (electrical)

- May be installed on all L-O-X® and manual L-O-X® with EEZ-ON® operation valves with pressure sensing port
- Provides a means to verify the release of downstream pressure to next obstruction

Verification Option	Model Number	Inlet Port Size*
Pop-Up Indicator	988A30	1/8
Pressure Switch	586A86	1/8

\* NPT port threads.



Pop-Up Indicator

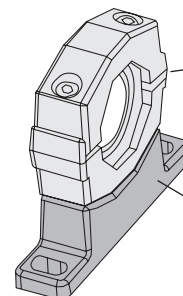
Pressure Switch

## CLAMP for MODULE CONNECTIONS

Specially designed clamps provide a quick and easy assembly or disassembly of MD3 modules. Two allen-head bolts quickly tighten or loosen the clamp using a 5/32 or 4mm hex key. The clamp contains a plate carrying two O-rings to provide positive sealing between modules. Order clamp by part number **R-A118-105**. Combined clamp and bracket (below) can be ordered by part number **R-A118-105M**.

## MOUNTING BRACKET

Two brackets are normally used to mount an FRL to a vertical surface. The mounting bracket attaches to the module-connecting clamp (see above) with a single screw. Each bracket then employs two bolts (1/4" or 6mm) to connect the assembly to the mounting surface. Order bracket and screw by part number **R-A118-103**. Combined bracket and clamp (above) can be ordered by part number **R-A118-105M**.



Module  
Connecting Clamp  
Part No. R-A118-105

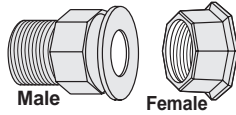
Combined  
Clamp & Bracket  
Part No. R-A118-105M

Mounting Bracket  
Part No. R-A118-103

# Accessories

## Male and Female End Ports

Either male or female end ports can be attached to threaded inlet and outlet lines. This allows all modules of an FRL assembly to be removed easily and quickly without having to unthread the end modules. The end ports are attached to the modules with clamps (see at left). End ports can be included in an assembled FRL or ordered separately by the following part numbers:

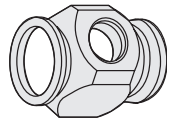


Port Size	Male Part Number*	Female Part Number*
1/4 NPTF	R-118-109-2F	R-118-100-2
3/8 NPTF	R-118-109-3F	R-118-100-3
1/2 NPTF	R-118-109-4F	R-118-100-4
3/4 NPTF	R-118-109-6F	R-118-100-6

For BSPP threads, add a "W" suffix to the model number, e.g., R-118-109-2FW.

## Extra Port Blocks

An extra port block can be placed between modules to provide two auxiliary 1/4 NPTF ports. Its mounting position can be rotated to obtain the most convenient operating orientation. If only one auxiliary port is to be used, the unused port must be closed with a pipe plug. (The inlet and outlet are not threaded.)



Port Size	Part Number*
1/4 NPTF	R-118-106-2
3/8 NPTF	R-118-106-3
1/2 NPTF	R-118-106-4

For BSPP threads, add a "W" suffix to the model number, e.g., R-118-109-2FW.

## CAUTIONS

### PRE-INSTALLATION or SERVICE

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

- 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.
- 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

- 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.
- 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.

*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.*

### ENERGY ISOLATION/EMERGENCY STOP

- Per specifications and regulations, ROSS L-O-X® valves and L-O-X® valves with EEZ-ON® operation 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. THE WARRANTY EXPRESSED ABOVE IS IN LIEU OF AND EXCLUSIVE OF ALL OTHER WARRANTIES AND ROSS EXPRESSLY DISCLAIMS ALL OTHER WARRANTIES EITHER EXPRESSED OR IMPLIED WITH RESPECT TO MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. ROSS 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 ROSS 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 ROSS MAY EXTEND THE LIABILITY OF ROSS AS SET FORTH HEREIN.



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This catalog presents an overview of the extensive ROSS product line. Other literature is available for engineering, maintenance, and service requirements. If you need products or specifications not shown here, please contact ROSS or your ROSS distributor. They will be happy to assist you in selecting the best product for your application.