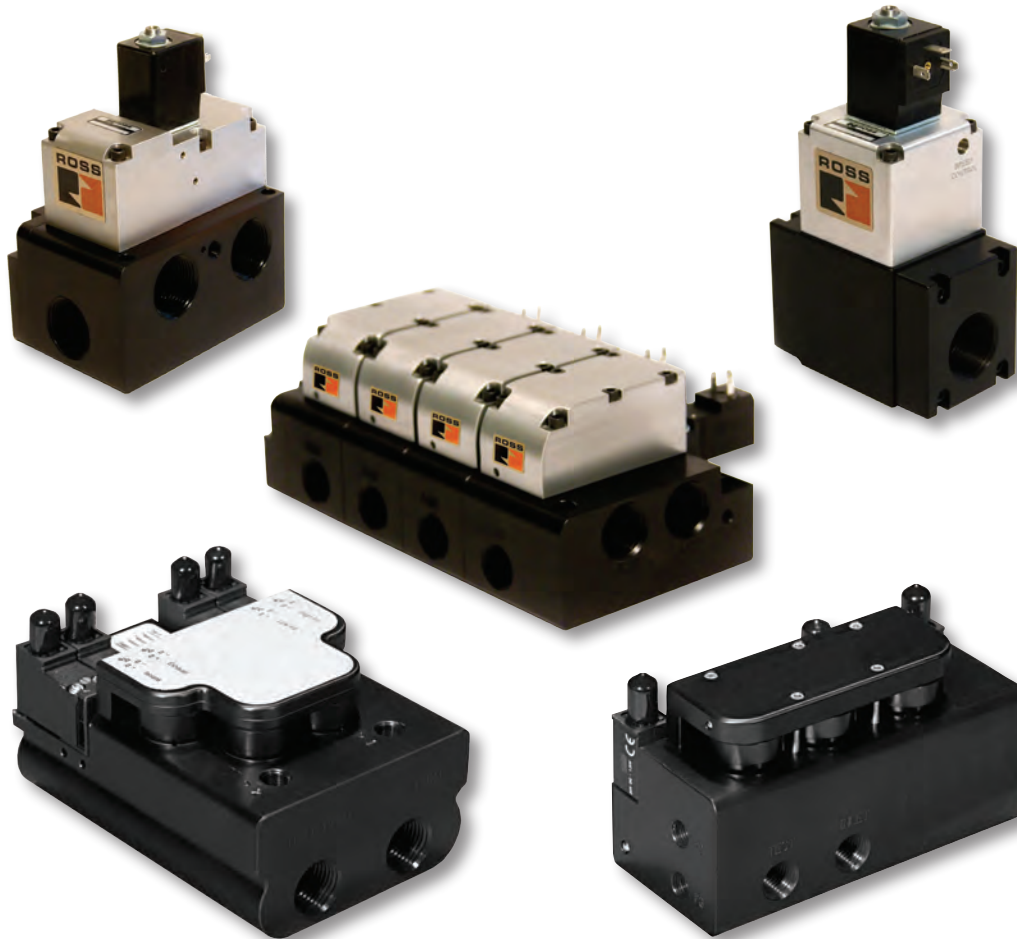


**Dale Series**  
**CP, CX, LF, LX & LT**  
**Manifold Compact Poppet Valves**  
**Inline Poppet Valves**  
**Leak Tight Valves & Manifolds**



• *Manufacturers of Premium Pneumatic Controls since 1921* •



Consider it **DONE!**

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*If you need products or specifications not shown within this bulletin, please contact ROSS® for more information or visit ROSS' website at [www.rosscontrols.com](http://www.rosscontrols.com).*

For additional information consult your ROSS distributor or call ROSS Technical Services  
in the U.S.A. at 1-888-TEK-ROSS (835-7677).

# The ROSS Poppet Valve . . . A ROSS Speciality from the Beginning

## Positive Sealing

Inlet air pressure forces the inlet poppet downward, pushing the poppet seal firmly against the seat. The higher the inlet pressure, the greater the sealing force. Note that the seal is engaged perpendicular to the seat; there is no sliding action to damage and wear the seal, or to cause erratic friction.

## Self-Cleaning and Dirt Tolerant

The flow velocity for a given volume of air is dependent upon the area through which it is flowing. The smaller the area, the greater the velocity.

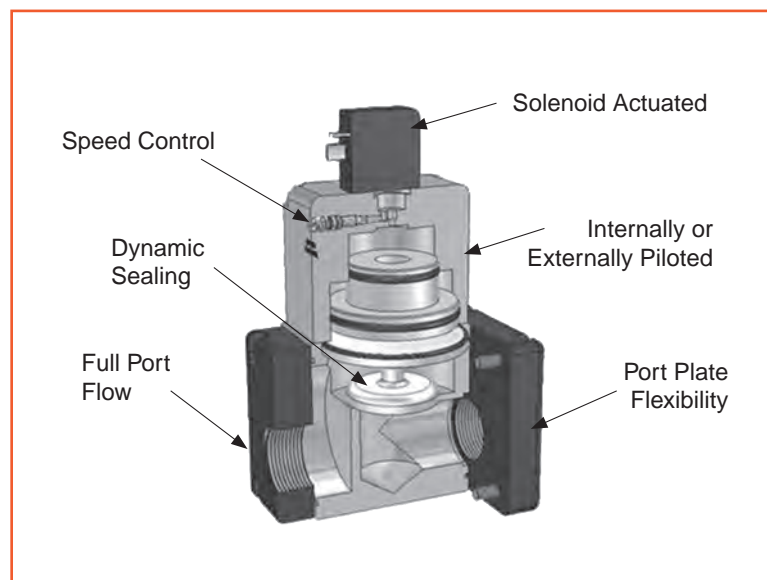
In poppet valves, the smallest flow-through area is across the poppet's seal and seat. This produces a very high velocity which blows all dirt and foreign matter out of the seat area for a virtually leak-proof seal.

## Repeatability Over the Life of the Valve

High velocity air flow begins at the instant when the inlet poppet moves off the seat; flow enhances actuation right from the start.

## Self-Compensating for Wear

Because of its superior design, any change in the height of the valve seal (due to compression) is automatically compensated for by an equal change in the length of stroke.

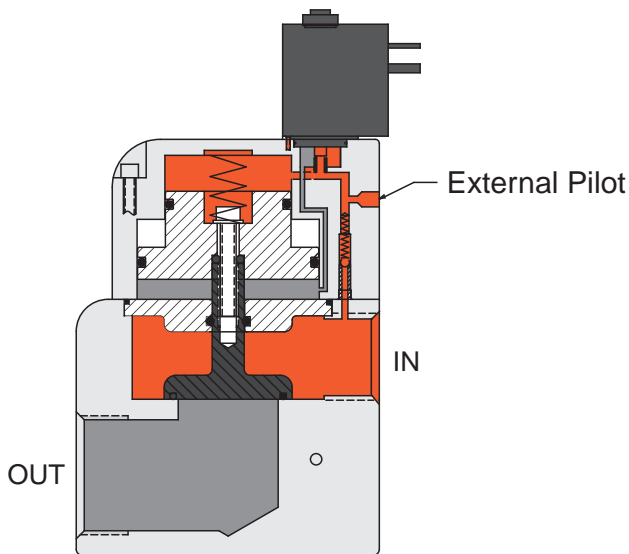


# Why do Poppet Valves Pop?

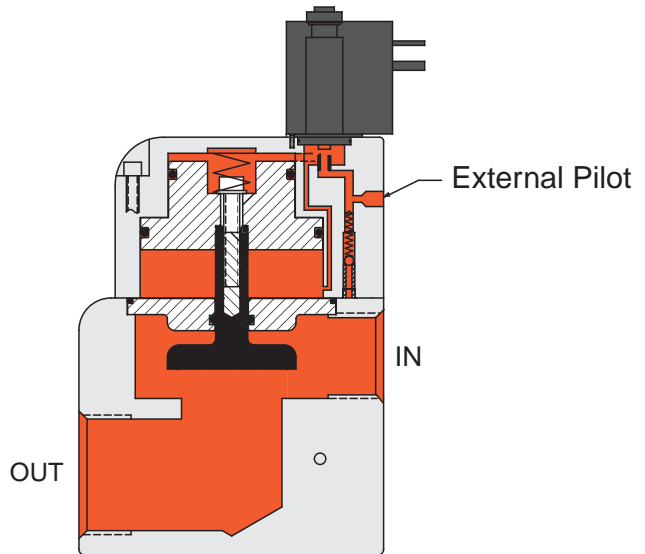
ROSS poppet valves pop open and closed almost instantly. Surface areas of the double piston and poppet are carefully calculated to produce strong shifting forces in both direction. This results in a design which ensures high speed, repeatability and high shifting forces.

## 2/2 Normally Closed

1 - Valve Not Actuated

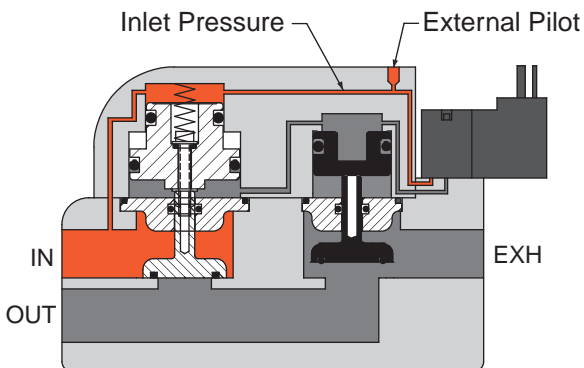


2 - Valve Actuated

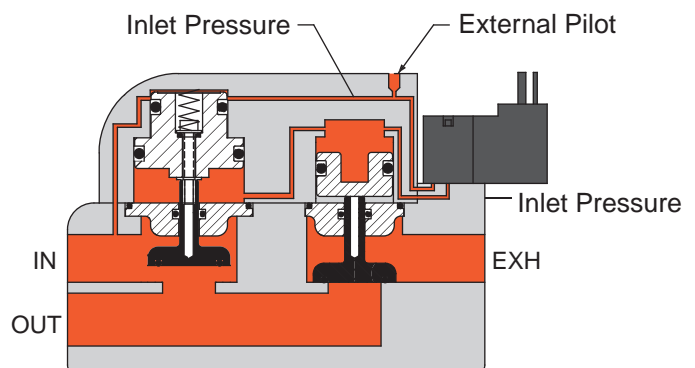


## 3/2 Normally Closed

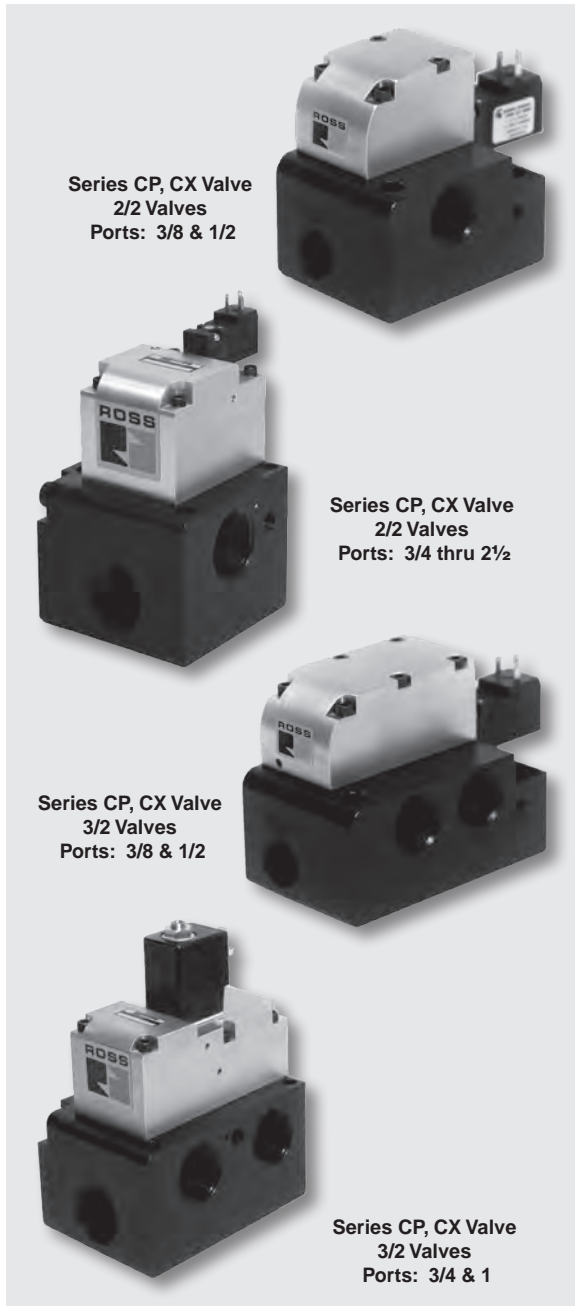
1 - Valve Not Actuated



2 - Valve Actuated



# Dale Series CP & CX Single Station Compact Poppet Valves



The Series CP and CX 2- or 3-way valves are available in normally-open, normally-closed with solenoid and remote pilot configurations. The 2-way valves range from 3/8" to 2 1/2" pipe size with an impressive Cv range of 3.5 to 100. This high-flow capability is a unique and valuable feature in such a compact valve manifold design. The 3-way valves range from 1/2" to 1" pipe size and have a Cv range of 3.2 to 12.3.

These valves can be ordered with inline or manifold base-mounted configurations (with through-holes), depending on the application requirements. This manifold capability allows customers to save time and money otherwise spent on piping and reduces potential leak paths, which saves energy.

For added flexibility, the valves are available with customer-specified manifolds, allowing them to combine normally-open, normally-closed, solenoid pilot or remote pressure control operation together in one manifold to create simple valve systems for traditionally complicated applications. For example, a common application for these valves is on equipment where media of different pressure levels (including vacuum) may need to be applied sequentially to a common work piece. Instead of piping up several valves together with hard pipe, the Series CP and CX valves can be configured into a common manifold. This is mostly possible due to the valves' revolutionary port pressure independence which can solve many configuration issues and provide customers with infinite design possibilities.

## FEATURES:

- Cost effective
- Compact design
- Robust construction
- High flow
- Port pressure independent
- Poppet construction for near zero leakage & high dirt tolerance
- Self-cleaning
- Wear compensating
- Ease of maintenance and repair
- Non-Lube service
- Continuous duty rated
- Repeatability throughout the life of the valve
- Leak tight construction (Series CX)

## APPLICATIONS:

- Pulp & Paper - Pulp slurries
- Steel Mills - Pickling slurries
- Vacuum Process
- Process Industry - Liquids
- Packaging - Food and chemical
- Blow Molding & Thermoforming
- Power Generation - Cooling water
- Industrial Mineral
- Automation - Leak Test (Series CX)
- General Purpose Process Solutions

For applications where weight is a consideration, the Series CP and CX valves are a great solution because of their lightweight anodized aluminum alloy construction. Due to their leak tight design, the Series CX models are well-equipped for leak testing applications. Whatever the application, though, customers can look forward to time savings and ease of maintenance because the valves provide non-lube service and its manifolds can be serviced or repaired in minutes.

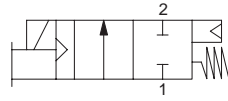
These cost effective valves offer customers a super high-flow product in a small, manifold-ready design. Continuing ROSS' 80 years tradition of innovation and reliability, the Series CP and CX have a dirt-tolerant poppet design and continuous duty rating which ensure long service life in a broad array of applications.

**Note:** 3/2 valves for vacuum applications consult Ross.

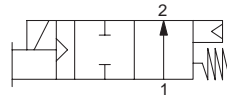


# Series CP, CX Solenoid Pilot Controlled Valves

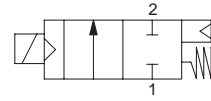
## Single Solenoid Pilot Controlled, Spring Assisted Air Return 2/2 Valves



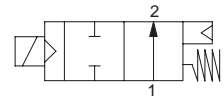
1/2" & 1" bodies  
Normally Closed (NC)



1/2" & 1" bodies  
Normally Open (NO)



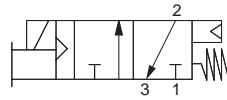
1 1/2" & 2 1/2" bodies  
Normally Closed (NC)



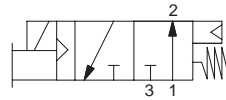
1 1/2" & 2 1/2" bodies  
Normally Open (NO)

Port Sizes		Valve Model Number*		Avg. C <sub>v</sub>	Length	Dimensions inches (mm)			Weight lb (kg)
1	2	NC	NO			Width	Height NC	Height NO	
1/2	3/8	CP14NA37101W	CP24NA37101W	3.5	3.83 (97.3)	2.83 (71.9)	2.85 (72.4)	2.85 (72.4)	1.4 (0.6)
1/2	1/2	CP14NA47101W	CP24NA47101W	3.5	3.83 (97.3)	2.83 (71.9)	2.85 (72.4)	2.85 (72.4)	1.4 (0.6)
1	3/4	CP16NA57101W	CP26NA57101W	12.3	4.16 (105.7)	3.45 (87.6)	5.63 (143.0)	5.63 (143.0)	3.5 (1.6)
1	1	CP16NA67101W	CP26NA67101W	12.3	4.16 (105.7)	3.45 (87.6)	5.63 (143.0)	5.63 (143.0)	3.5 (1.6)
1 1/2	1 1/4	CP18NA77101W	CP28NA77101W	44.9	5.37 (136.6)	5.00 (127.0)	8.52 (216.4)	8.86 (225.0)	10.0 (4.6)
1 1/2	1 1/2	CP18NA87101W	CP28NA87101W	44.9	5.37 (136.6)	5.00 (127.0)	8.52 (216.4)	8.86 (225.0)	10.0 (4.6)
2 1/2	2	CP10NA97101W	CP20NA97101W	100	6.35 (161.3)	6.75 (171.5)	10.40 (264.1)	10.73 (272.5)	19.5 (8.9)
2 1/2	2 1/2	CP10NA07101W	CP20NA07101W	100	6.35 (161.3)	6.75 (171.5)	10.40 (264.1)	10.73 (272.5)	19.5 (8.9)

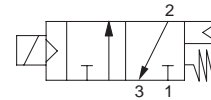
## 3/2 Valves



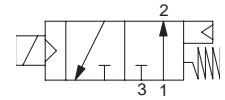
1/2" body  
Normally Closed (NC)



1/2" body  
Normally Open (NO)



1" body  
Normally Closed (NC)



1" body  
Normally Open (NO)

Port Sizes		Valve Model Number*		Avg. C <sub>v</sub>	Length	Dimensions inches (mm)			Weight lb (kg)
1	2	NC	NO			Width	Height NC	Height NO	
1/2	3/8	CP34NA37101W	CP44NA37101W	3.5	4.57 (116.1)	2.83 (71.9)	2.85 (72.4)	2.85 (72.4)	1.8 (0.8)
1/2	1/2	CP34NA47101W	CP44NA47101W	3.5	4.57 (116.1)	2.83 (71.9)	2.85 (72.4)	2.85 (72.4)	1.8 (0.8)
1	3/4	CP36NA57101W	CP46NA57101W	12.3	5.00 (127.0)	3.45 (87.6)	6.33 (160.8)	6.99 (177.5)	5.3 (2.4)
1	1	CP36NA67101W	CP46NA67101W	12.3	5.00 (127.0)	3.45 (87.6)	6.33 (160.8)	6.99 (177.5)	5.3 (2.4)

\* For models with external pilot supply, replace shaded "1" in the model number with a "5", e.g., CP14NA37501W.

For BSPP threads, replace "N" in the model number with a "D", e.g., CP14DA37101W.

For 120 volts AC, 50/60 Hz, replace suffix "W" with "Z", e.g., CP14NA37101Z.

Electrical connectors not included, see page 7 for ordering information.

**Models for vacuum, liquid or leak tight construction: for 2/2 valves replace prefix "CP" with "CX", e.g., CX14NA37101W; for 3/2 valves, consult ROSS.**

### STANDARD SPECIFICATIONS (for valves on this page):

For Series CP, CX Solenoid Pilot Controlled Valves.

**Pilot Solenoid:** AC or DC power. Rated for continuous duty.

Voltage and hertz ratings shown on pilot housing.

**Standard Voltages:** 24 volts DC; 120 volts AC 50/60 Hz.

#### Power Consumption:

2/2 Valves, NC & NO with 1/2" and 1" inlet, 3/2 Valves NC & NO with 1/2" inlet: 3 VA on AC; 2.5 watts on DC.

2/2 Valves NC & NO with 1/2" and 2 1/2" inlet, 3/2 Valves NC & NO with 1" inlet: 36 VA inrush, 23 VA holding on AC; 15 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 recommended.

**Inlet Pressure:** Vacuum to 145 psig (10 bar), (vacuum service requires external pilot supply).

**Pilot Pressure:** 30 to 145 psig (2 to 10 bar). Must be equal to or greater than inlet pressure. For vacuum service models requiring external pilot supply, a pilot pressure of at least 30 psig (2 bar) is required.

**Override:** Standard on 2/2 valves, 3/8" thru 1" bodies and 3/2 valves, 3/8" and 1/2" bodies. Non-Locking.

**Port Threads:** NPT, BSPP.

**Note:** For liquid applications, consult ROSS.

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



# Series CP, CX Solenoid Pilot Controlled Valves

## ELECTRICAL CONNECTORS:

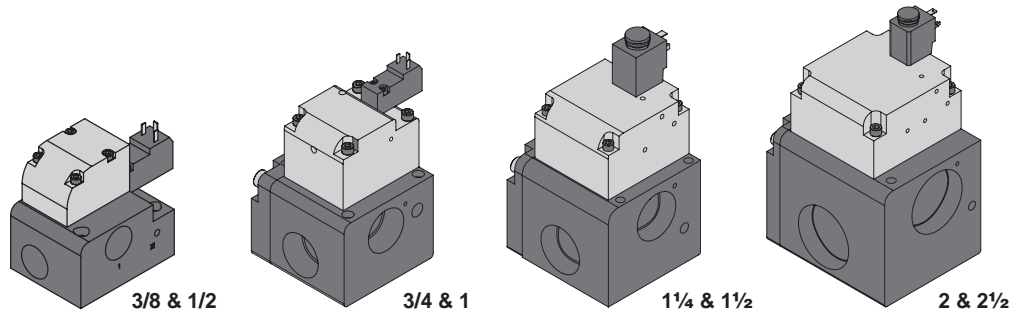
For Series CP, CX Solenoid Pilot Controlled Valves.



### Part Numbers of Electrical Connectors

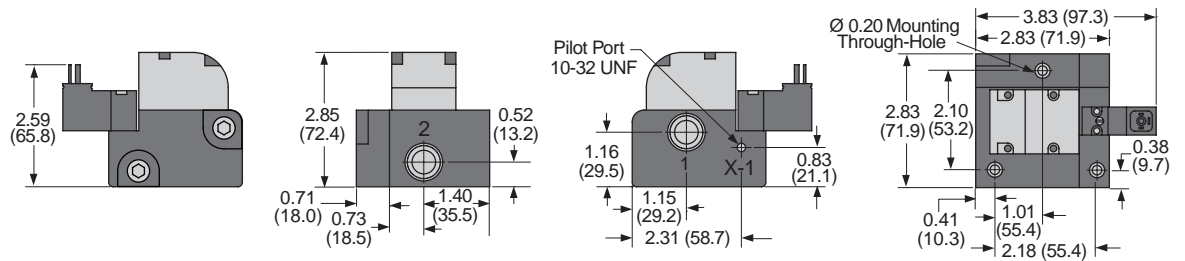
Valve Type	Port Size	Lighted Connector Only		Lighted Connector Pre-wired*	
		24 volts DC	110 Volts AC	24 volts DC	110 Volts AC
2/2	1/2 - 1	2306K77-W	2306K77-Z	2307K77-W	2307K77-Z
2/2	1½ - 2½	936K87-W	936K87-Z	720K77-W	720K77-Z
3/2	1/2	2306K77-W	2306K77-Z	2307K77-W	2307K77-Z
3/2	NC 1	936K87-W	936K87-Z	720K77-W	720K77-Z
3/2	NO 1	267K77-W	267K77-Z	382K77-W	382K77-Z

\*Pre-wired connectors include a 2 meter (6½ ft.) cord.

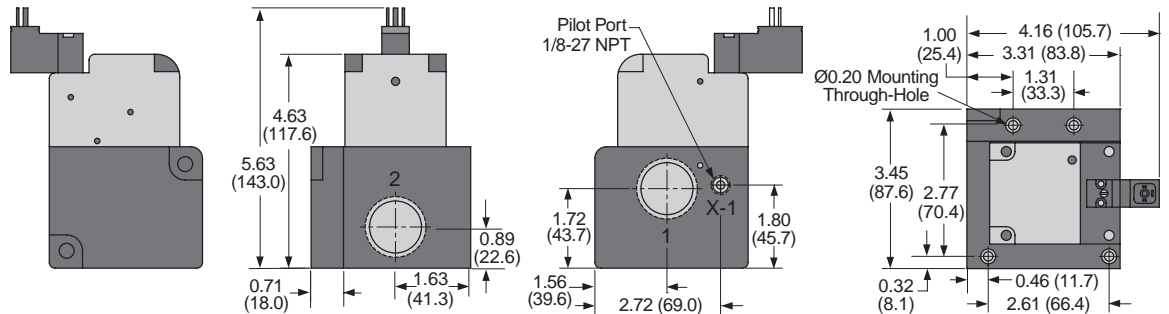


## 2/2 Valve Dimensions – inches (mm)

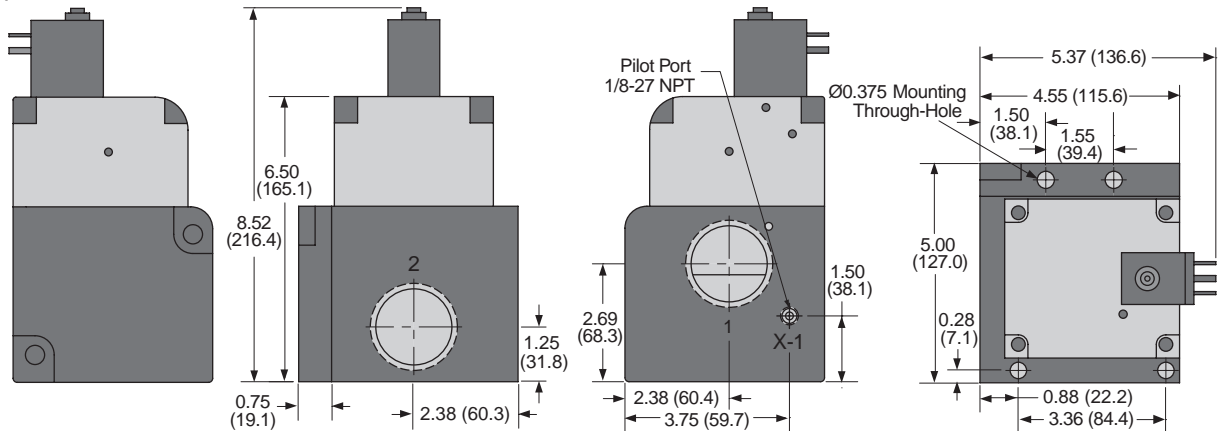
### Port Sizes: 3/8 & 1/2



### Port Sizes : 3/4 & 1



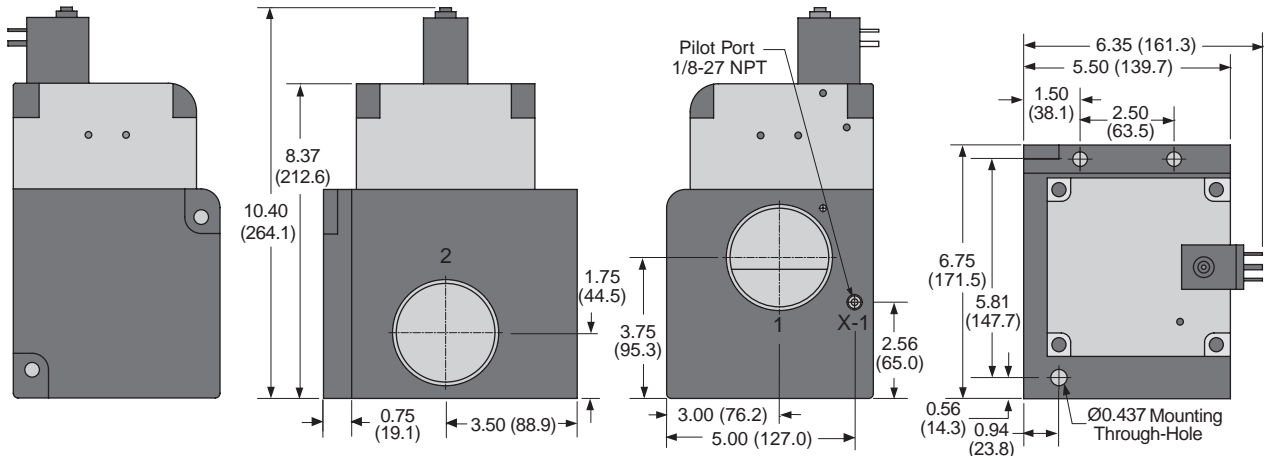
### Port Sizes: 1¼ & 1½



# Series CP, CX Solenoid Pilot Controlled Valves

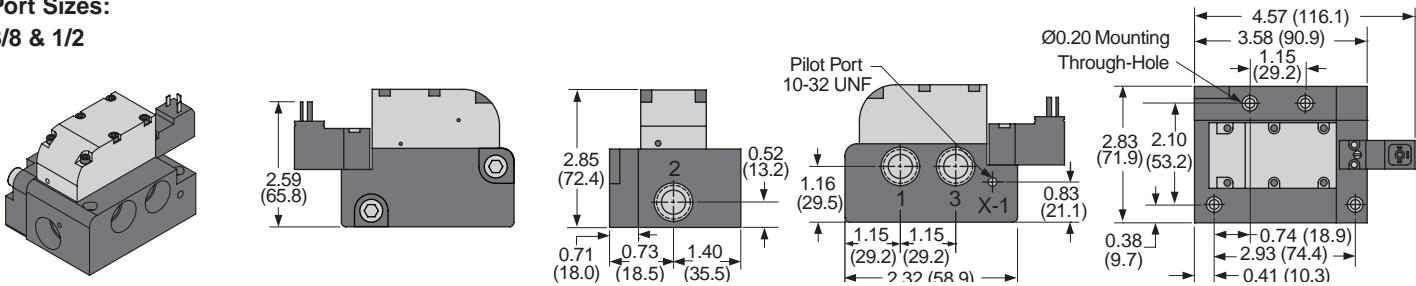
## 2/2 Valve Dimensions – inches (mm)

Port Sizes:  
2 & 2½

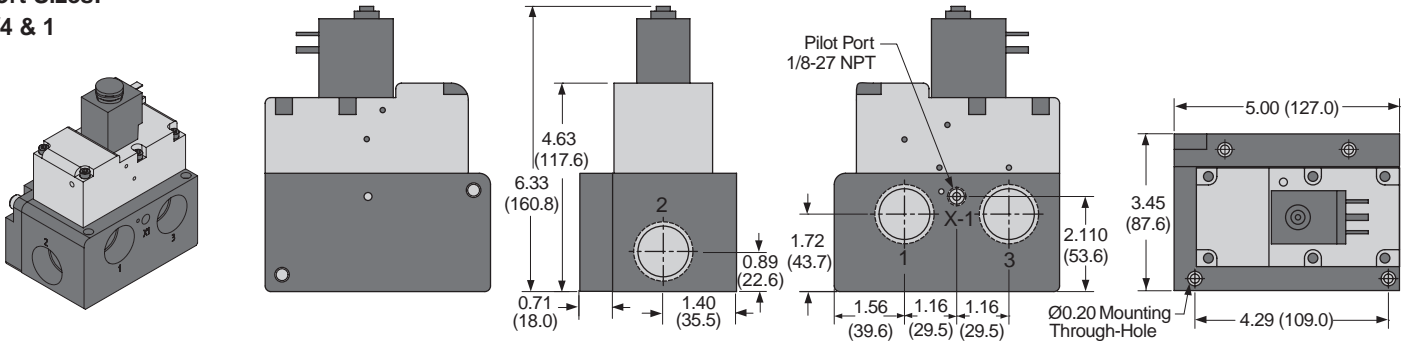


## 3/2 Valve Dimensions – inches (mm)

Port Sizes:  
3/8 & 1/2

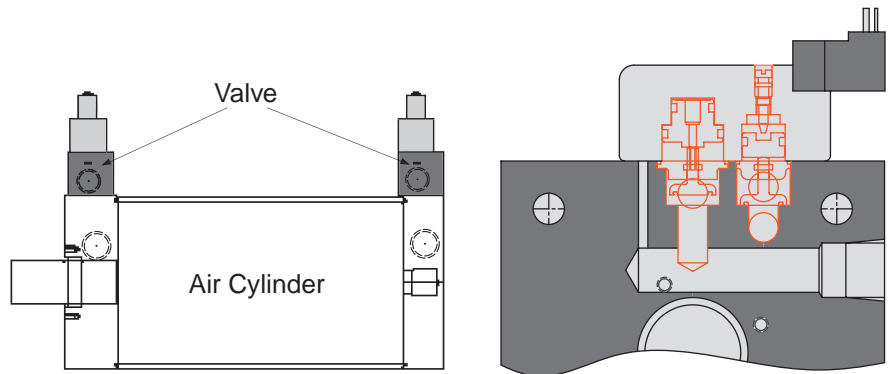


Port Sizes:  
3/4 & 1



## Applications Examples

The CP series 3-way valves can be ported from the bottom and attach directly to the rod and cap end a cylinder. The CP series 3-way can also be supplied as a cartridge valve that can be machined directly into the cylinder heads. Both methods increase speed, eliminate line loss, improve cylinder control, and greatly reduce operating cost.

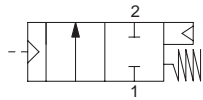




# Series CX Pressure Controlled Valves

## Pressure Controlled, Spring Assisted Air Return

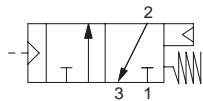
### 2/2 Valves



2/2 Normally Closed (NC)

Port Sizes		Valve Model Number*	Avg. $C_v$	Dimensions inches (mm)			Weight
1	2	NC		Length	Width	Height	lb (kg)
1/2	3/8	CX14NA35501	3.5	3.19 (81.1)	2.83 (71.9)	2.85 (72.4)	1.4 (0.6)
1/2	1/2	CX14NA45501	3.5	3.19 (81.1)	2.83 (71.9)	2.85 (72.4)	1.4 (0.6)
1	3/4	CX16NA55501	12.3	3.53 (89.6)	3.45 (87.6)	4.49 (125.5)	3.5 (1.6)
1	1	CX16NA65501	12.3	3.53 (89.6)	3.45 (87.6)	4.49 (125.5)	3.5 (1.6)
1½	1¼	CX18NA75501	44.9	4.55 (115.6)	5.00 (127.0)	6.88 (174.6)	10.0 (4.6)
1½	1½	CX18NA85501	44.9	4.55 (115.6)	5.00 (127.0)	6.88 (174.6)	10.0 (4.6)
2½	2	CX10NA95501	100	5.50 (139.7)	6.75 (171.5)	8.75 (222.2)	19.5 (8.9)
2½	2½	CX10NA05501	100	5.50 (139.7)	6.75 (171.5)	8.75 (222.2)	19.5 (8.9)

### 3/2 Valves



3/2 Normally Closed (NC)

Port Sizes		Valve Model Number*	Avg. $C_v$	Dimensions inches (mm)			Weight
1	2	NC		Length	Width	Height	lb (kg)
1/2	3/8	CX34NA35501	3.5	3.19 (81.1)	2.83 (71.9)	2.85 (72.4)	1.4 (0.6)
1/2	1/2	CX34NA45501	3.5	3.19 (81.1)	2.83 (71.9)	2.85 (72.4)	1.4 (0.6)
1	3/4	CX36NA55501	12.3	3.53 (89.6)	3.45 (87.6)	4.49 (125.5)	3.5 (1.6)
1	1	CX36NA65501	12.3	3.53 (89.6)	3.45 (87.6)	4.49 (125.5)	3.5 (1.6)

\* For BSPP threads, replace "N" in the model number with a "D", e.g., CX34DA35501.

#### STANDARD SPECIFICATIONS (for valves on this page):

For Series CX Pressure Controlled Valves.

**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.

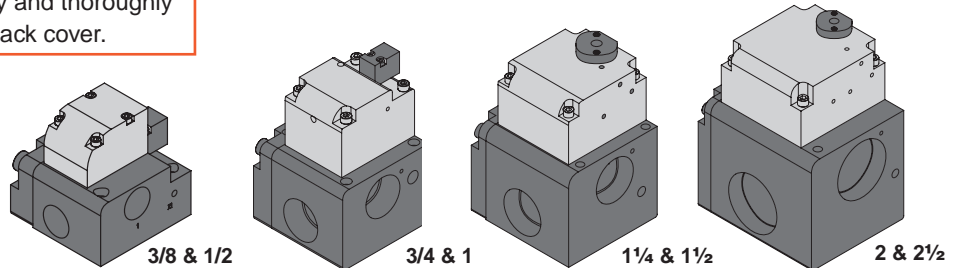
**Inlet Pressure:** Vacuum to 250 psig (17 bar).

**Pilot Pressure:** 30 to 145 psig (2 to 10 bar). Must be equal to or greater than inlet pressure. For vacuum service models requiring external pilot supply, a pilot pressure of at least 30 psig (2 bar) is required.

**Port Threads:** NPT, BSPP.

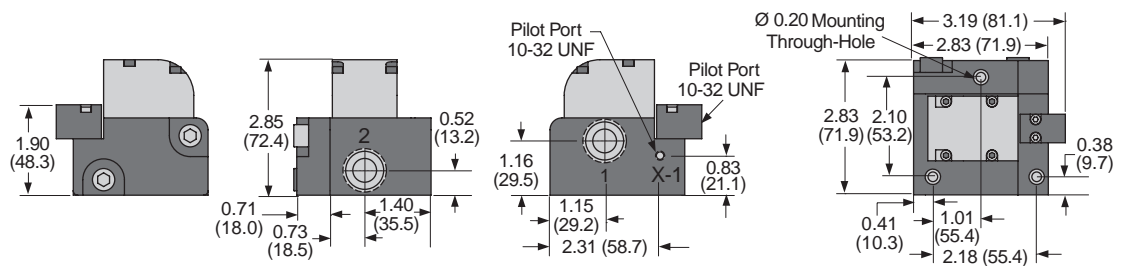
**Note:** For liquid applications, consult ROSS.

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

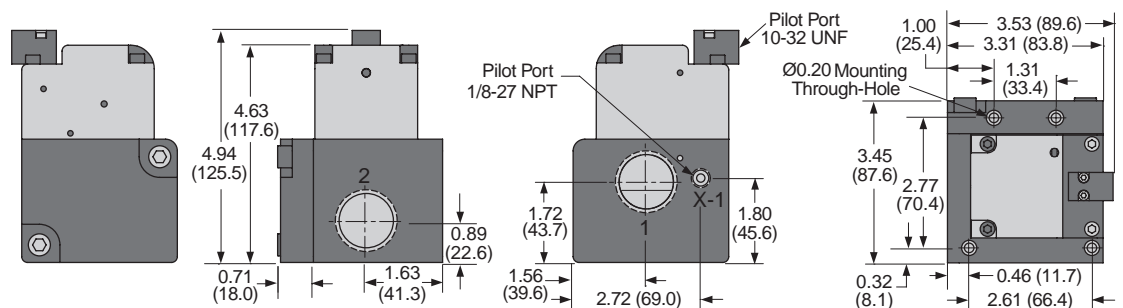


2/2 Valve Dimensions – inches (mm)

#### Port Sizes: 3/8 & 1/2



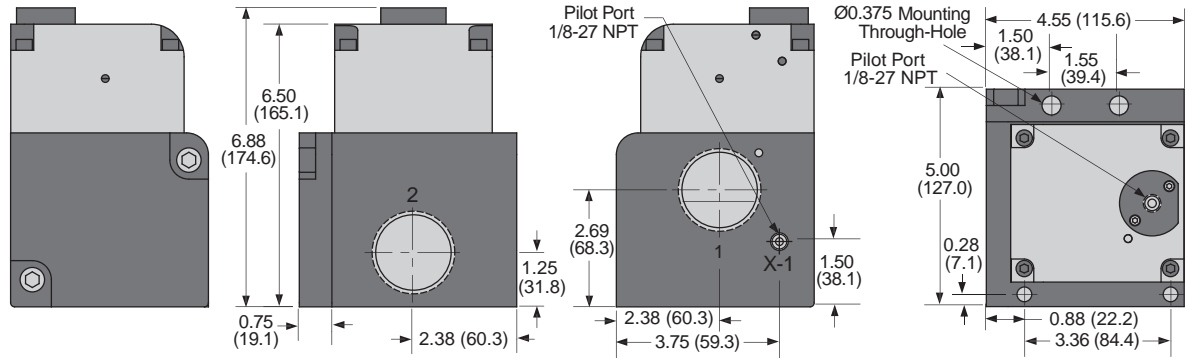
#### Port Sizes : 3/4 & 1



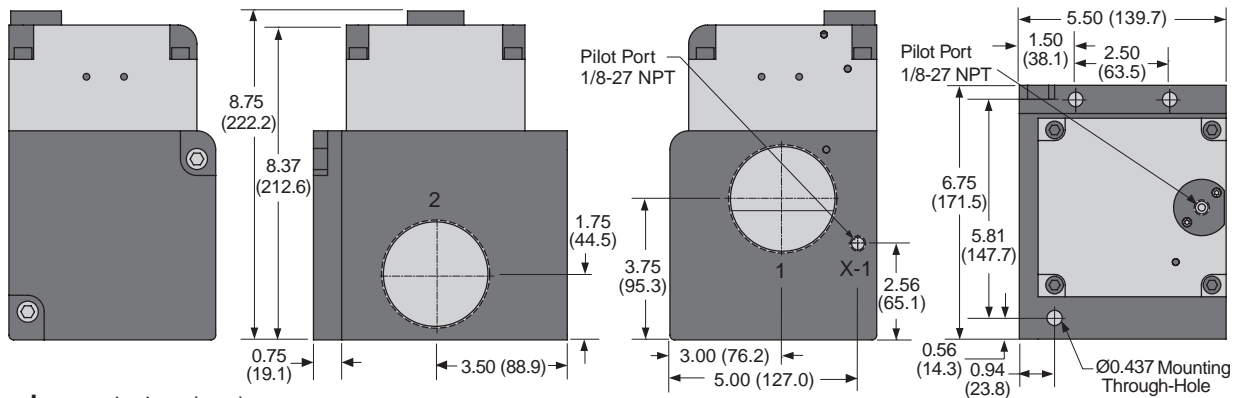
# Series CP, CX Pressure Controlled Valves

## 2/2 Valve Dimensions – inches (mm)

Port Sizes:  
1/4 & 1/2

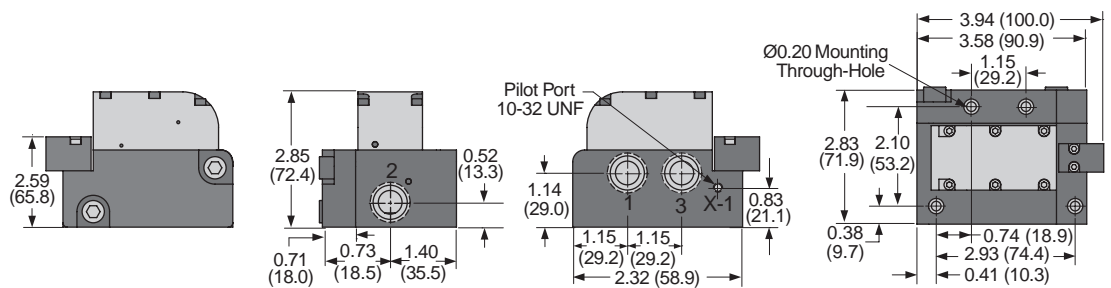
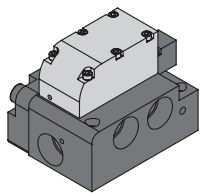


Port Sizes:  
2 & 2 1/2

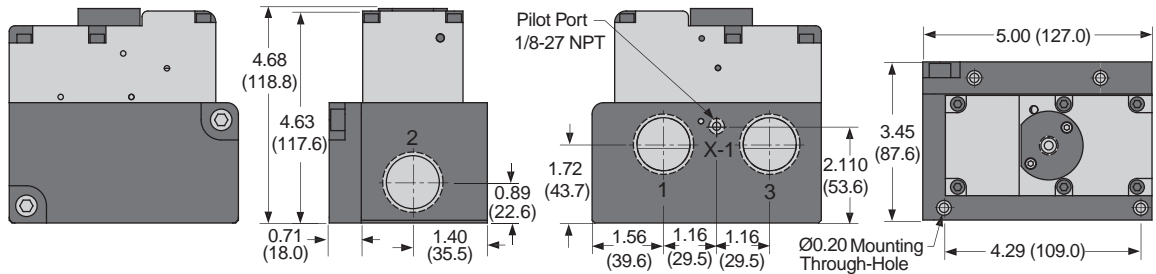
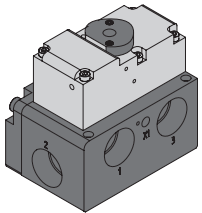


## 3/2 Valve Dimensions – inches (mm)

Port Sizes:  
3/8 & 1/2

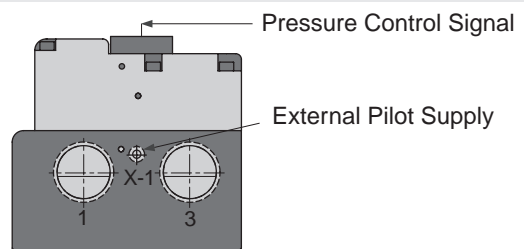


Port Sizes:  
3/4 & 1



## Additional Valve Information

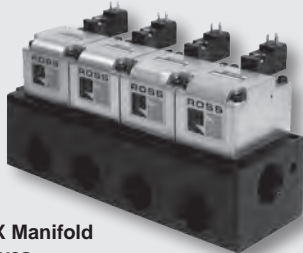
**Note:** The Dale series pressure controlled valves require both an external pilot supply and a control signal to operate the valve. When a pressure control signal is applied the valve shifts to the open position.



# Series CP, CX Manifold Compact Poppet Valves



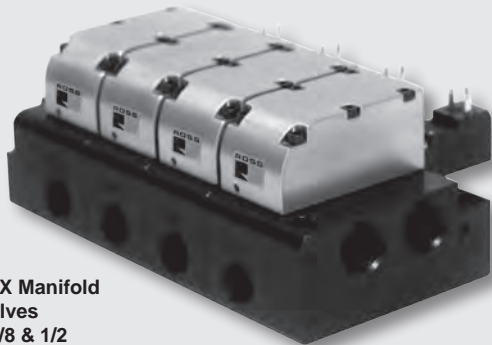
Series CP, CX Manifold  
2/2 Valves  
Ports: 3/8 & 1/2



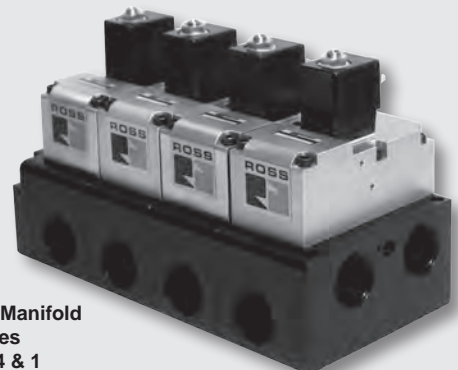
Series CP, CX Manifold  
2/2 Valves  
Ports: 3/4 & 1



Series CP, CX Manifold  
2/2 Valves  
Ports: 1 1/4 thru 2 1/2



Series CP, CX Manifold  
3/2 Valves  
Ports: 3/8 & 1/2



Series CP, CX Manifold  
3/2 Valves  
Ports: 3/4 & 1

The Dale Series CP and CX poppet valves provide flexible and innovative solutions for applications requiring port pressure independence and compact manifold mounting.

The Dale Series family offers customers a high-flow product in a compact envelope with minimal weight. The valves utilize a robust, dirt-tolerant poppet design that ensures long service life.

Constructed of lightweight anodized aluminum, the valves also provide bonded Buna-N sealing surfaces. The Dale Series valves have non-lube service for easy maintenance, are easy to repair and feature pressure/media independent ports.

The CP and CX models have either inline or stackable manifold design with through-hole mounting. They are offered in 1/2, 1, 1 1/2 and 2 1/2" sizes, 2 and 3-way normally-closed, normally-open design and solenoid or remote pilot-operated configurations. The unique CP and CX designs allow customers to combine normally-open, normally-closed, solenoid pilot or remote pressure control operated valves together on a single manifold for enhanced design flexibility. The CX model is designed for processes requiring leak tight valves (such as vacuum applications). The CP and CX models work well in process solution, channel selection and process routing applications.

## FEATURES:

- Cost effective
- Compact design
- Robust construction
- High flow
- Port pressure independent
- Poppet construction for near zero leakage & high dirt tolerance
- Self-cleaning
- Wear compensating
- Ease of maintenance and repair
- Non-Lube service
- Continuous duty rated
- Repeatability throughout the life of the valve
- Leak tight construction (Series CX)

## APPLICATIONS:

- Pulp & Paper - Pulp slurries
- Steel Mills - Pickling slurries
- Vacuum Process
- Process Industry - Liquids
- Packaging - Food and chemical
- Blow Molding & Thermoforming
- Power Generation - Cooling water
- Industrial Mineral
- Automation - Leak Test (Series CX)
- General Purpose Process Solutions

For applications where weight is a consideration, the Series CP and CX valves are a great solution because of their lightweight anodized aluminum alloy construction. Due to their leak tight design, the Series CX models are well-equipped for leak testing applications. Whatever the application, though, customers can look forward to time savings and ease of maintenance because the valves provide non-lube service and its manifolds can be serviced or repaired in minutes.

These cost effective valves offer customers a super high-flow product in a small, manifold-ready design. Continuing ROSS' 80 years tradition of innovation and reliability, the Series CP and CX have a dirt-tolerant poppet design and continuous duty rating which ensure long service life in a broad array of applications.

**Note:** 3/2 valves for vacuum applications consult ROSS.

# Series CP, CX Manifold, Solenoid Pilot Controlled Valves

## Single Solenoid Pilot Controlled, Spring Assisted Air Return 2/2 & 3/2 Valves

When ordering the Dale Series CP, CX preassembled manifold valves with the same model number select the part number from the chart on the right.

Manifolds can be ordered from two to ten stations.

For solenoid pilot controlled, indicate the number of stations with the digit preceding the voltage code.

Solenoid Pilot Controlled, manifold part number example:

**CP14NA37114W**, 4 = Number of Stations

Complete valves-on-manifold assemblies can be ordered to fit your precise requirements.

When ordering the Dale Series CP, CX manifold valves with different valve functions, please see page 16 for ordering information.

Port Sizes		Valve Model Number*		Avg. C <sub>v</sub>
1	2	Normally Closed	Normally Open	
<b>2/2 Solenoid Pilot Controlled</b>				
1/2	3/8	CP14NA3711XW	CP24NA3711XW	3.7
1/2	1/2	CP14NA4711XW	CP24NA4711XW	3.7
1	3/4	CP16NA5711XW	CP26NA5711XW	13.7
1	1	CP16NA6711XW	CP26NA6711XW	13.7
1½	1¼	CP18NA7711XW	CP28NA7711XW	44.9
1½	1½	CP18NA8711XW	CP28NA8711XW	44.9
2½	2	CP10NA9711XW	CP20NA9711XW	100
2½	2½	CP10NA0711XW	CP20NA0711XW	100
<b>3/2 Solenoid Pilot Controlled</b>				
1/2	3/8	CP34NA3711XW	CP44NA3711XW	3.6
1/2	1/2	CP34NA4711XW	CP44NA4711XW	3.6
1	3/4	CP36NA5711XW	CP46NA5711XW	12.3
1	1	CP36NA6711XW	CP46NA6711XW	12.3

\* For models with external pilot supply, replace shaded "1" in the model number with a "5", e.g., CP14NA3751XW.

For the number of stations desired, replace "X" in the model number with the specific number of stations., e.g., CP14NA37516W (6-station assembly).

For 120 volts AC, 50/60 Hz, replace suffix "W" with "Z", e.g., CP14NA3711XZ.

For BSPP threads, replace "N" in the model number with a "D", e.g., CP14DA3711XW.

Electrical connectors not included, see below for ordering information.

**Models for vacuum, liquid or leak tight construction: for 2/2 valves replace prefix "CP" with "CX", e.g., CX14NA3711XW; for 3/2 valves, consult ROSS.**

### STANDARD SPECIFICATIONS (for valves on this page):

For Series CP, CX Solenoid Pilot Controlled Valves.

**Pilot Solenoid:** AC or DC power. Rated for continuous duty. Voltage and hertz ratings shown on pilot housing.

**Standard Voltages:** 24 volts DC; 120 volts AC 50/60 Hz.

**2/2 Valves, NC & NO with 1/2" and 1" inlet, 3/2 Valves NC & NO with 1/2" inlet:** 3 VA on AC; 2.5 watts on DC.

**2/2 valves NC & NO with ½" and 2½" inlet, 3/2 Valves NC & NO with 1" inlet:** 36 VA inrush, 23 VA holding on AC; 15 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 recommended.

**Inlet Pressure:** Vacuum to 145 psig (10 bar), (vacuum service requires external pilot supply).

**Pilot Pressure:** 30 to 145 psig (2 to 10 bar). Must be equal to or greater than inlet pressure. For vacuum service models requiring external pilot supply, a pilot pressure of at least 30 psig (2 bar) is required.

**Override:** Standard on 2/2 valves, 3/8" thru 1" bodies and 3/2 valves, 3/8" and 1/2" bodies. Non-Locking.

**Port Threads:** NPT, BSPP.

**Note:** For fluid applications, consult ROSS.

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

### ELECTRICAL CONNECTORS:

For Series CP, CX Solenoid Pilot Controlled Valves.

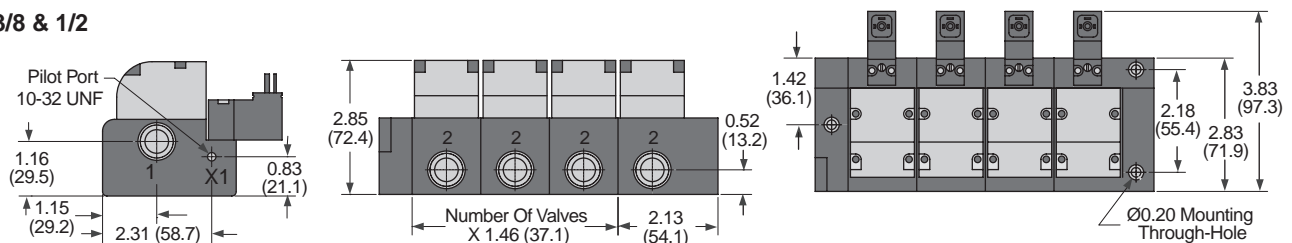


Valve Type	Port Size	Part Numbers of Electrical Connectors			
		Lighted Connector Only		Lighted Connector Pre-wired*	
		24 volts DC	110 Volts AC	24 volts DC	110 Volts AC
2/2	1/2 - 1	2306K77-W	2306K77-Z	2307K77-W	2307K77-Z
2/2	1½ - 2½	936K87-W	936K87-Z	720K77-W	720K77-Z
3/2	1/2	2306K77-W	2306K77-Z	2307K77-W	2307K77-Z
3/2	NC 1	936K87-W	936K87-Z	720K77-W	720K77-Z
3/2	NO 1	267K77-W	267K77-Z	382K77-W	382K77-Z

\*Pre-wired connectors include a 2 meter (6½ ft.) cord.

### 2/2 Valve Manifold Dimensions – inches (mm)

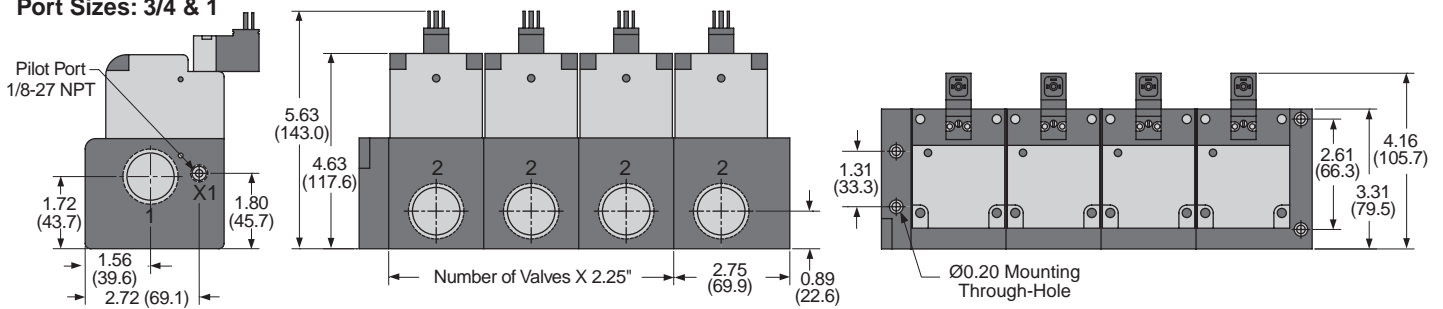
#### Port Sizes: 3/8 & 1/2



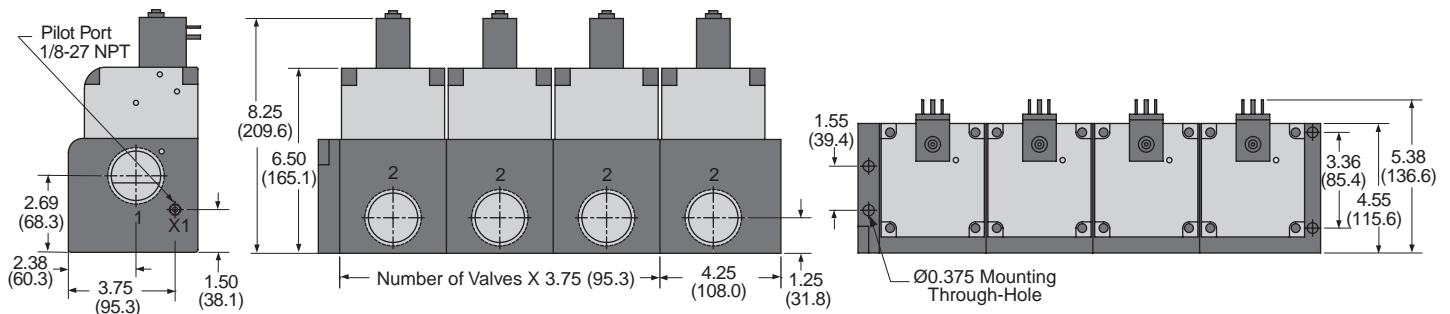
# Series CP, CX Manifold, Solenoid Pilot Controlled Valves

## 2/2 Valve Manifold Dimensions – inches (mm)

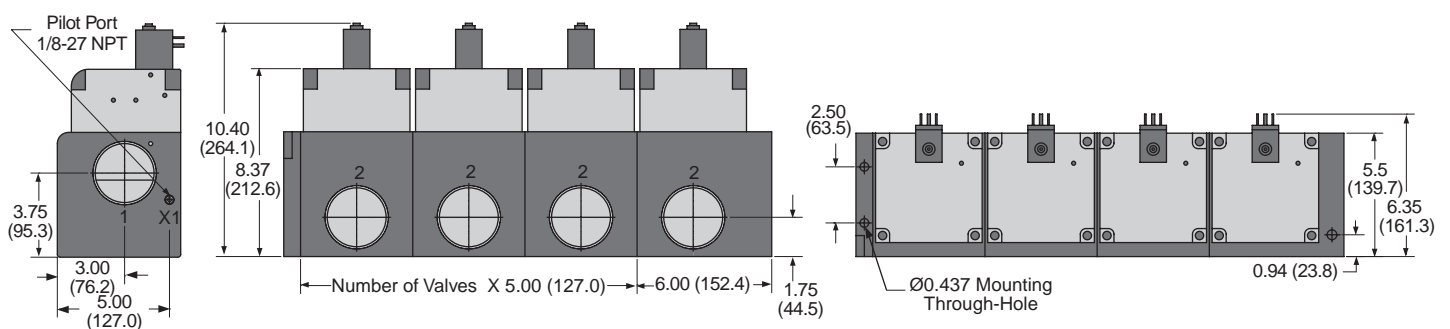
### Port Sizes: 3/4 & 1



### Port Sizes: 1 1/4 & 1 1/2

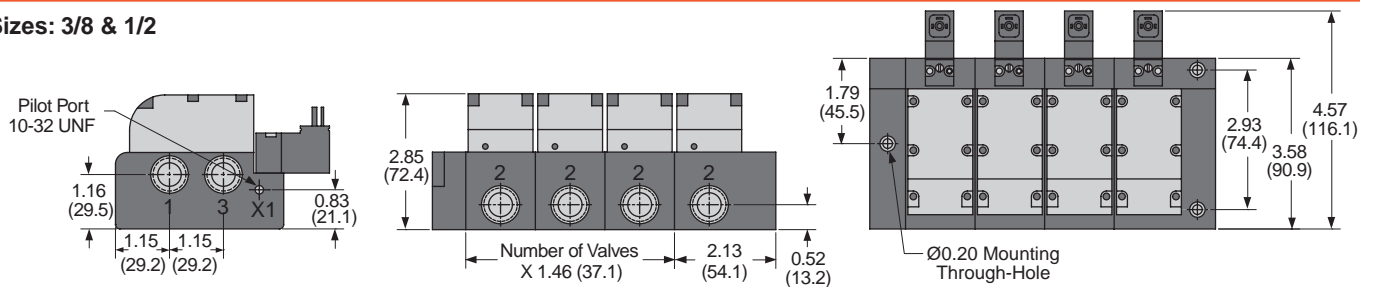


### Port Sizes: 2 & 2 1/2

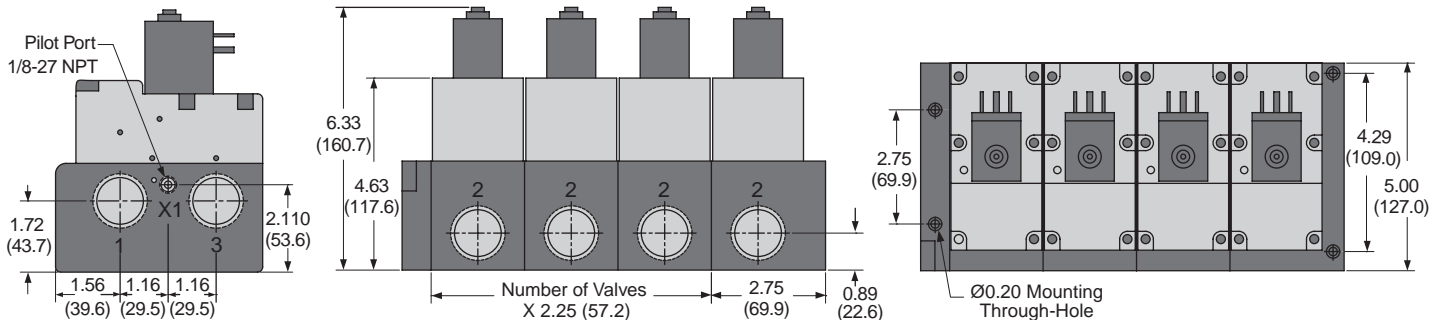


## 3/2 Valve Manifold Dimensions – inches (mm)

### Port Sizes: 3/8 & 1/2



### Port Sizes: 3/4 & 1





# Series CX Manifold, Pressure Controlled Valves

## Pressure Controlled, Spring Assisted Air Return 2/2 & 3/2 Valves

When ordering the Dale Series CX preassembled manifold valves with the same model number select the part number from the chart on the right.

Manifolds can be ordered from two to ten stations.  
For pressure controlled, indicate the number of stations with the last digit.

Pressure Controlled, manifold part number example:  
CX14NA35514, 4 = Number of Stations

Complete valves-on-manifold assemblies can be ordered to fit your precise requirements.

Blocking plates and threaded end plates available, contact ROSS for more information.

When ordering the Dale Series CX manifold valves with different valve functions, please see page 16 for ordering information.

Port Sizes		Valve Model Number*	Avg. C <sub>v</sub>
1	2	Normally Closed	
<b>2/2 Pressure Controlled</b>			
1/2	3/8	CX14NA3551X	3.7
1/2	1/2	CX14NA4551X	3.7
1	3/4	CX16NA5551X	13.7
1	1	CX16NA6551X	13.7
1½	1¼	CX18NA7551X	44.9
1½	1½	CX18NA8551X	44.9
2½	2	CX10NA9551X	100
2½	2½	CX10NA0551X	100
<b>3/2 Pressure Controlled</b>			
1/2	3/8	CX34NA3551X	3.6
1/2	1/2	CX34NA4551X	3.6
1	3/4	CX36NA5551X	12.3
1	1	CX36NA6551X	12.3

\* For the number of stations desired, replace "X" in the model number with the specific number of stations., e.g., CX14NA35516 (6-station assembly).  
For BSPP threads, replace "N" in the model number with a "D", e.g., CX14DA3551X.

### STANDARD SPECIFICATIONS:

For Series CX Pressure Controlled Valves.

**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:** Vacuum to 250 psig (17 bar).

**Pilot Pressure:** 30 to 145 psig (2 to 10 bar). Must be equal to or greater than inlet pressure. For vacuum service models requiring external pilot supply, a pilot pressure of at least 30 psig (2 bar) is required.

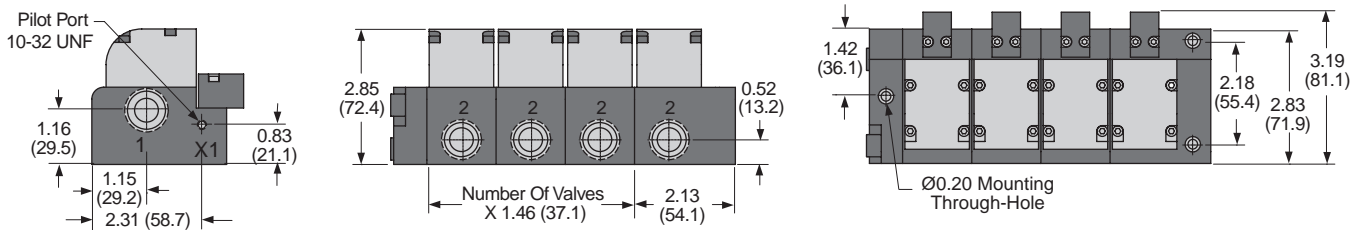
**Port Threads:** NPT, BSPP.

**Note:** For fluid applications, consult ROSS.

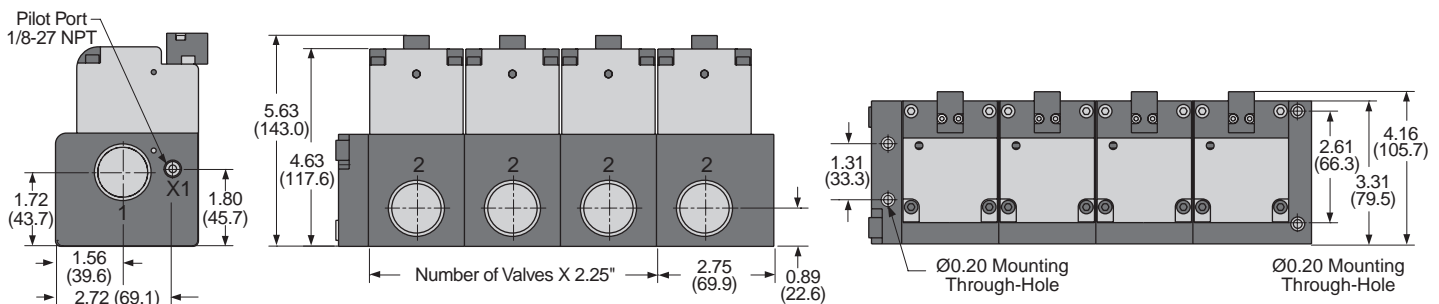
**IMPORTANT NOTE:** Please read carefully and thoroughly all of the **CAUTIONS** on the inside back cover.

### 2/2 Valve Manifold Dimensions – inches (mm)

#### Port Sizes: 3/8 & 1/2



#### Port Sizes: 3/4 & 1

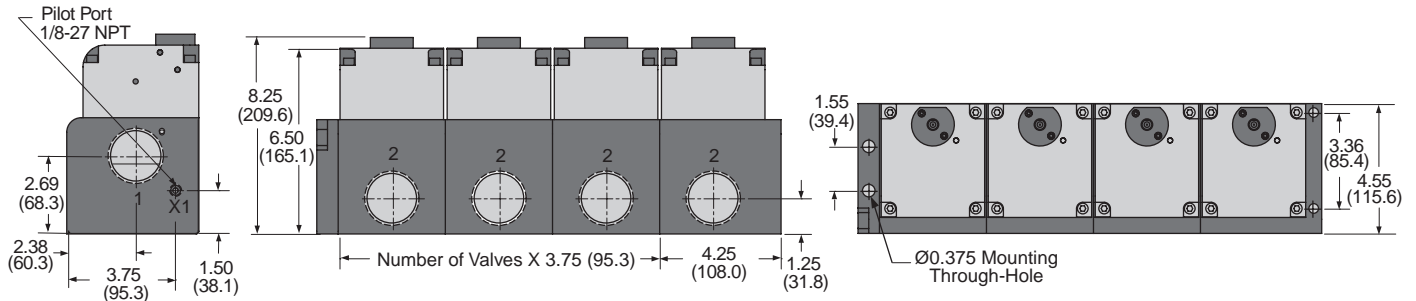




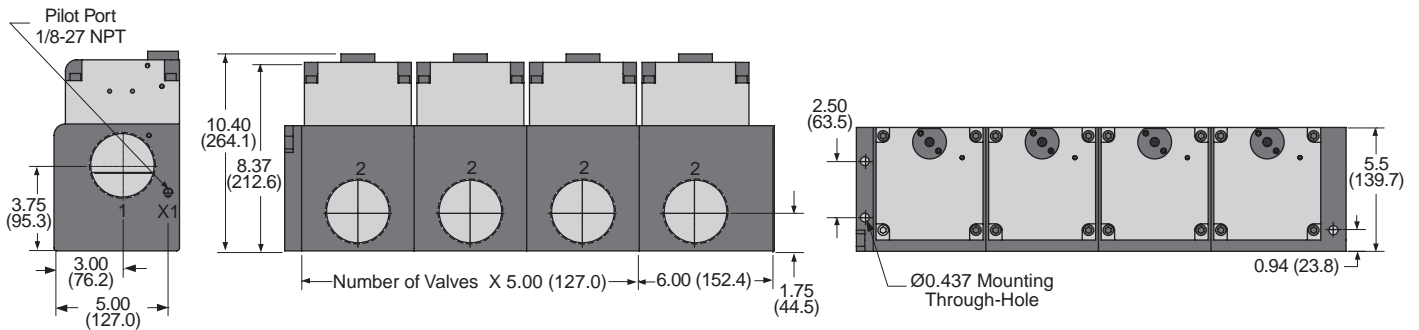
# Series CP, CX Manifold, Pressure Controlled Valves

## 2/2 Valve Manifold Dimensions – inches (mm)

### Port Sizes: 1¼ & 1½

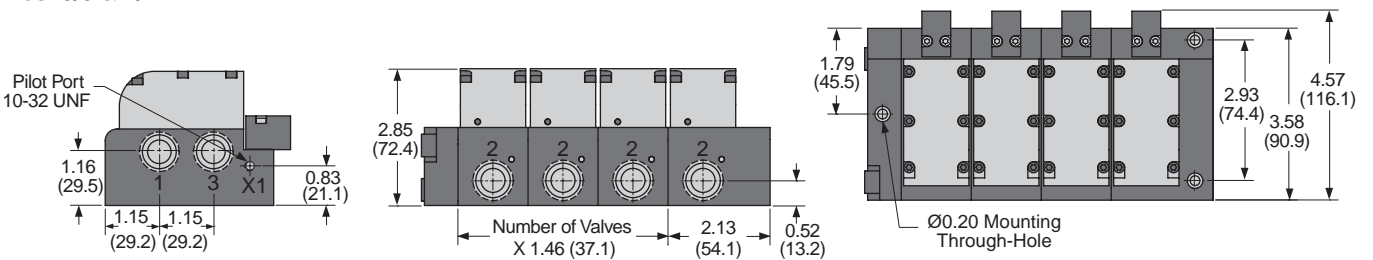


### Port Sizes: 2 & 2½

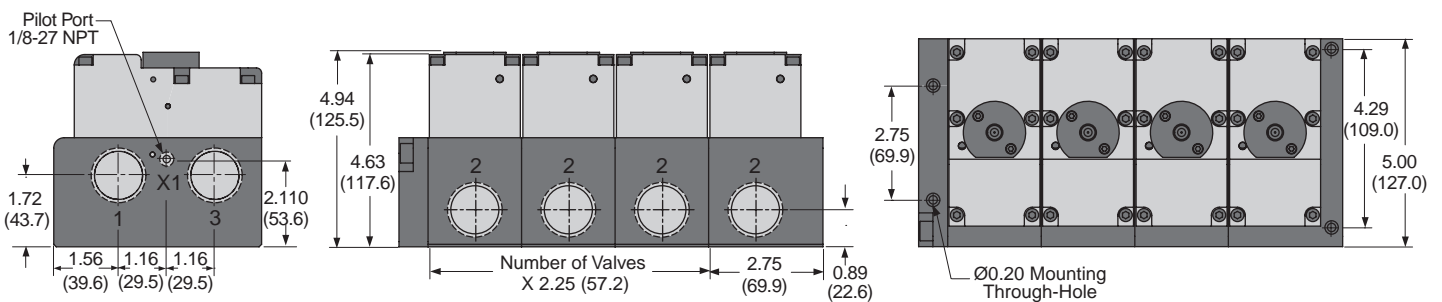


## 3/2 Valve Manifold Dimensions – inches (mm)

### Port Sizes: 3/8 & 1/2



### Port Sizes: 3/4 & 1



# Series CP, CX Assembled Manifolds Ordering Information

Complete valves-on-manifold assemblies can be ordered to fit your precise requirements. A copy of this page can be used to provide ROSS with your specific assembly instructions.

When ordering the Dale Series CP, CX manifold valves with different valve functions - for example a normally closed, normally open and 2 pressure controlled valves, list the valves in the chart below.

Manifolds can be ordered from two to ten stations.

Blocking plates and threaded end plates available, contact ROSS for more information.

**Note:** Be sure that these instructions are identified by your company name and address, as well as a contact name.

Valve Position Number*	Valve Model Number	Valve Function

\*Inlet station 1 is on the right, while viewing manifold from the outlet ports.

Ordered By: \_\_\_\_\_ Date: \_\_\_\_\_

Company Name \_\_\_\_\_

Address \_\_\_\_\_

City, State, Zip Code \_\_\_\_\_

Contact Name \_\_\_\_\_ P.O. No \_\_\_\_\_

Example:

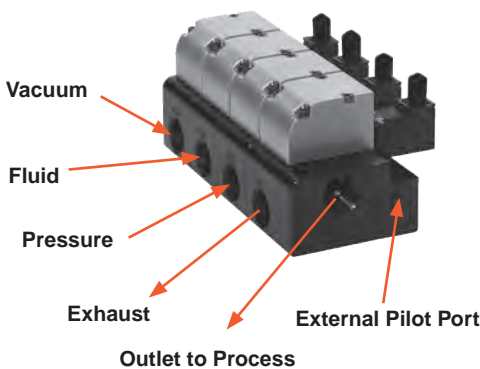
Valve Position Number*	Valve Model Number	Valve Function
1	CP14NA37101Z	Normally Closed (NC)
2	CP24NA37111Z	Normally Open (NO)
3	CP14NA35111	Pressure Controlled
4	CP14NA35111	Pressure Controlled

\*Inlet station 1 is on the right, while viewing manifold from the outlet ports.

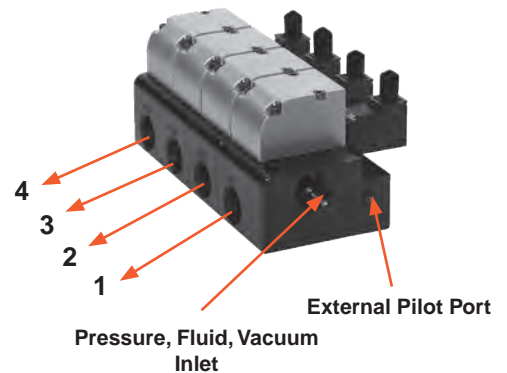
After the chart is complete, submit to ROSS for preassembly part number, price and delivery.

## Applications Examples

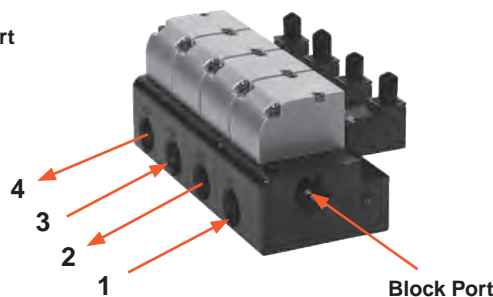
Process Solutions



Channel Selection



Process Routing



# Series LF, LX Inline Poppet Valves



The Dale Series LF and LX models are inline mounted, have full port flow and port plate flexibility. They are available in 3/8, 1/2, 3/4, 1, 1 1/4, 1 1/2, 2, and 2 1/2 port sizes and are offered in 2-way normally-open or normally-closed, and solenoid or pressure controlled configurations. The valves have a Cv range of 3.6 to 64.7.

The LF models are a superior choice to commonly used diaphragm and ball valves. Diaphragm valves have disadvantages such as short life cycles, single flow direction and the potential to fail catastrophically. Ball valves are also problematic with their slow activation, expense, repair difficulty, and requirement of a secondary valve.

The Dale Series LF valves, however, are solenoid-operated, easy to repair, fail to open or closed, have a dirt-tolerant poppet design, bi-directional flow and speed control, provide full flow, and are cost effective. The LF and LX models are a good fit for leak testing, pick and place, vacuum and semiconductor manufacturing applications, among others.

The LF models are available in internally or externally-piloted designs; the LX models are available in external pilot design only and are leak tight.

## FEATURES:

- Cost effective
- Compact design
- Robust construction
- Full flow
- Speed Control - fast shift or controlled shift in both ways, to eliminate hammering
- Poppet construction for near zero leakage & high dirt tolerance
- Ease of maintenance and repair
- Continuous duty rated
- Repeatability throughout the life of the valve
- Leak tight construction (Series LX)

## APPLICATIONS:

- Pulp & Paper - Pulp slurries
- Steel Mills - Pickling slurries
- Packaging - Food and chemical
- Power Generation - Cooling water
- Industrial Mineral
- Vacuum
- Leak Test (Series CX)
- Thermoforming
- Transportation
- Fiberglass
- Rubber Mixing
- Pressure Pilot Valves

The Series LF and LX valves do not restrict airflow at inlet or outlet, so they are suitable for applications where full flow is required. For applications where weight is a consideration, the Series LF and LX valves are a great solution because of their lightweight anodized aluminum alloy construction. Due to their leak tight design, the Series LX models are well-equipped for leak testing applications.

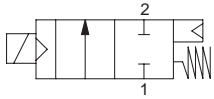
Whatever the application, though, customers can look forward to time savings and ease-of-maintenance because the valves provide non-lube service and are easily repairable.

These cost effective valves offer customers a super high-flow product in a small design. Continuing ROSS' 80 years tradition of innovation and reliability, the Series LF and LX have a dirt-tolerant poppet design and continuous duty rating which ensure long service life in a broad array of applications.

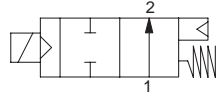


# Series LF, LX Solenoid Pilot Controlled Valves

## Single Solenoid Pilot Controlled, Spring Assisted Air Return 2/2 Valves



Normally Closed (NC)



Normally Open (NO)

Port Sizes		Valve Model Number*		Avg. C <sub>v</sub>	Length	Dimensions inches (mm)			Weight lb (kg)
1	2	NC	NO			Width	Height NC	Height NO	
3/8	3/8	LF13NA37101W	LF23NA37101W	3.6	3.12 (79.4)	1.88 (47.7)	4.81 (122.2)	5.45 (138.4)	1.5 (0.7)
1/2	1/2	LF14NA47101W	LF24NA47101W	3.6	3.12 (79.4)	1.88 (47.7)	4.81 (122.2)	5.45 (138.4)	1.5 (0.7)
3/4	3/4	LF15NA57101W	LF25NA57101W	12.2	4.12 (104.7)	2.50 (63.5)	6.96 (176.8)	7.30 (185.4)	3.5 (1.6)
1	1	LF16NA67101W	LF26NA67101W	12.2	4.12 (104.7)	2.50 (63.5)	6.96 (176.8)	7.30 (185.4)	3.5 (1.6)
1¼	1¼	LF17NA77101W	LF27NA77101W	36.1	9.12 (231.7)	3.75 (95.3)	5.50 (139.7)	9.46 (240.3)	9.3 (4.2)
1½	1½	LF18NA87101W	LF28NA87101W	36.1	9.12 (231.7)	3.75 (95.3)	5.50 (139.7)	9.46 (240.3)	9.3 (4.2)
2	2	LF19NA97101W	LF29NA97101W	64.7	10.72 (272.2)	5.00 (127.0)	7.50 (190.5)	10.99 (279.1)	19.3 (8.8)
2½	2½	LF10NA07101W	LF20NA07101W	64.7	10.72 (272.2)	5.00 (127.0)	7.50 (190.5)	10.99 (279.1)	19.3 (8.8)

\* For models with external pilot supply, replace shaded "1" in the model number with a "5", e.g., LF13NA37501Z.

For BSPP threads, replace "N" in the model number with a "D", e.g., LF13DA37101W.

For 120 volts AC, 50/60 Hz, replace suffix "W" with "Z", e.g., LF13NA37101Z.

Electrical connectors not included, see below for accessories.

### STANDARD SPECIFICATIONS (for valves on this page):

**Pilot Solenoid:** AC or DC power. Rated for continuous duty. Voltage and hertz ratings shown on pilot housing.

**Standard Voltages:** 24 volts DC; 120 volts AC 50/60 Hz.

#### Power Consumption:

Port size 3/8" and 1/2" inlet: 9.8 VA on AC; 7.5 watts on DC.

Port size 3/4 thru 2½" inlet: 36 VA inrush, 23 VA holding on AC; 15 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 recommended.

**Inlet Pressure:** Vacuum to 145 psig (10 bar), (vacuum service requires external pilot supply).

**Pilot Pressure:** 30 to 145 psig (2 to 10 bar). Must be equal to or greater than inlet pressure. For vacuum service models requiring external pilot supply, a pilot pressure of at least 30 psig (2 bar) is required.

**Port Threads:** NPT, BSPP.

**Note:** For fluid applications, consult ROSS.

### ELECTRICAL CONNECTORS: For Series LF, LX Solenoid Pilot Controlled Valves.

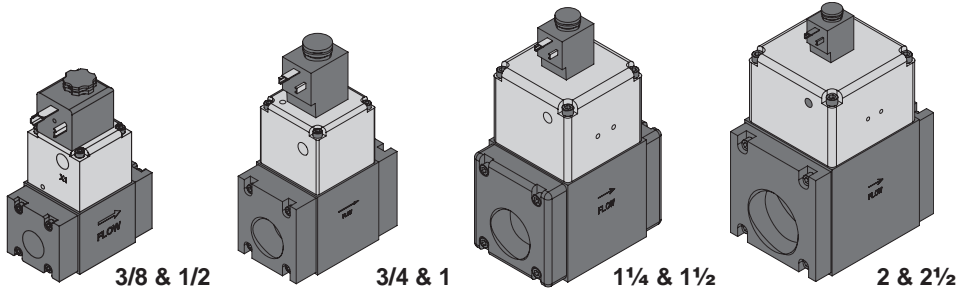


Valve Port Size	Part Numbers of Electrical Connectors			
	Lighted Connector Only		Lighted Connector Pre-wired*	
	24 Volts DC	110 Volts AC	24 Volts DC	110 Volts AC
NC 3/8, 1/2	267K77-W	267K77-Z	382K77-W	382K77-Z
NO 3/8 - 1	267K77-W	267K77-Z	382K77-W	382K77-Z
NC 3/4 - 2½	936K87-W	936K87-Z	720K77-W	720K77-Z
NO 1¼ - 2½	936K87-W	936K87-Z	720K77-W	720K77-Z

\*Pre-wired connectors include a 2 meter (6½ ft.) cord.

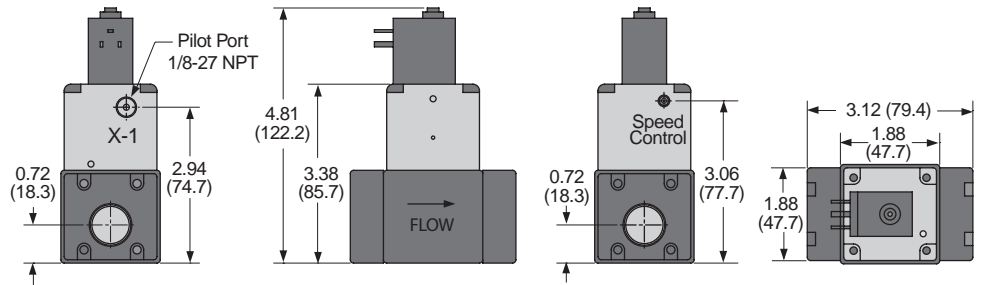
**IMPORTANT NOTE:** Please read carefully and thoroughly all of the **CAUTIONS** on the inside back cover.

# Series LF, LX Solenoid Pilot Controlled Valves

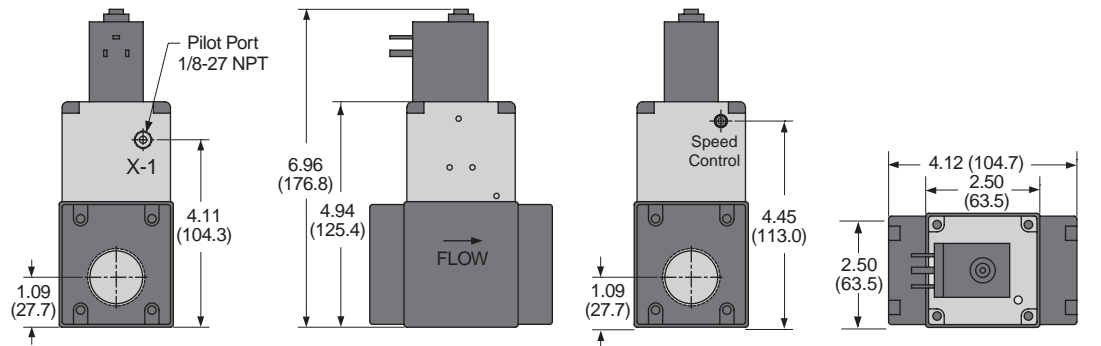


Valve Dimensions – inches (mm)

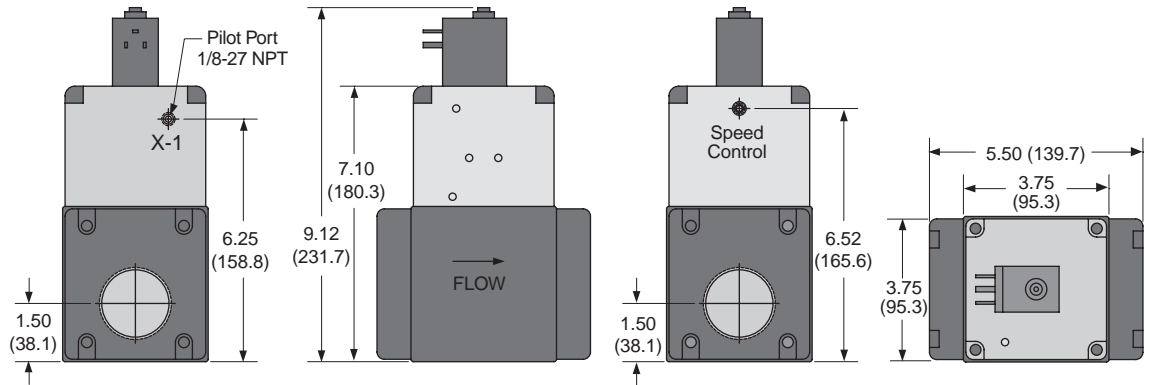
## Port Sizes: 3/8 & 1/2



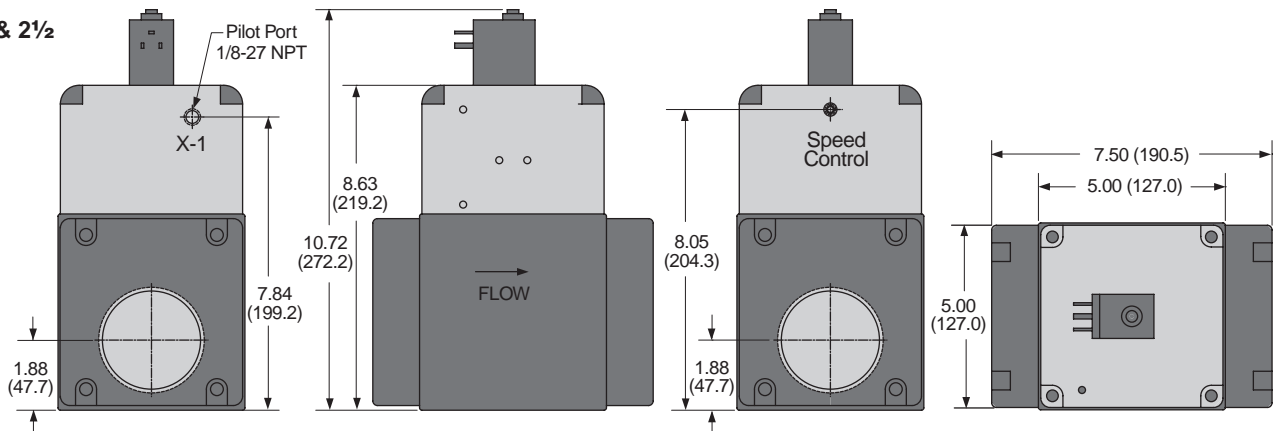
## Port Sizes: 3/4 & 1



## Port Sizes: 1 1/4 & 1 1/2



## Port Sizes: 2 & 2 1/2



# Series LX Pressure Controlled Valves

## 2/2 Valves



Port Sizes		Valve Model Number*	Avg. $C_v$	Dimensions inches (mm)			Weight
1	2	NC	$C_v$	Length	Width	Height	lb (kg)
3/8	3/8	LX13NA35501	3.6	3.83 (97.3)	2.83 (71.9)	2.85 (72.4)	1.4 (0.6)
1/2	1/2	LX14NA45501	3.6	3.83 (97.3)	2.83 (71.9)	2.85 (72.4)	1.4 (0.6)
3/4	3/4	LX15NA55501	12.2	4.16 (105.7)	3.45 (87.6)	5.63 (143.0)	3.5 (1.6)
1	1	LX16NA65501	12.2	4.16 (105.7)	3.45 (87.6)	5.63 (143.0)	3.5 (1.6)
1¼	1¼	LX17NA75501	36.1	5.37 (136.6)	5.00 (127.0)	8.52 (216.4)	10.0 (4.6)
1½	1½	LX18NA85501	36.1	5.37 (136.6)	5.00 (127.0)	8.52 (216.4)	10.0 (4.6)
2	2	LX19NA95501	64.7	6.35 (161.3)	6.75 (171.5)	10.40 (264.1)	19.5 (8.9)
2½	2½	LX10NA05501	64.7	6.35 (161.3)	6.75 (171.5)	10.40 (264.1)	19.5 (8.9)

\* For BSPP threads, replace "N" in the model number with a "D", e.g., LX13DA35501.

### 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.

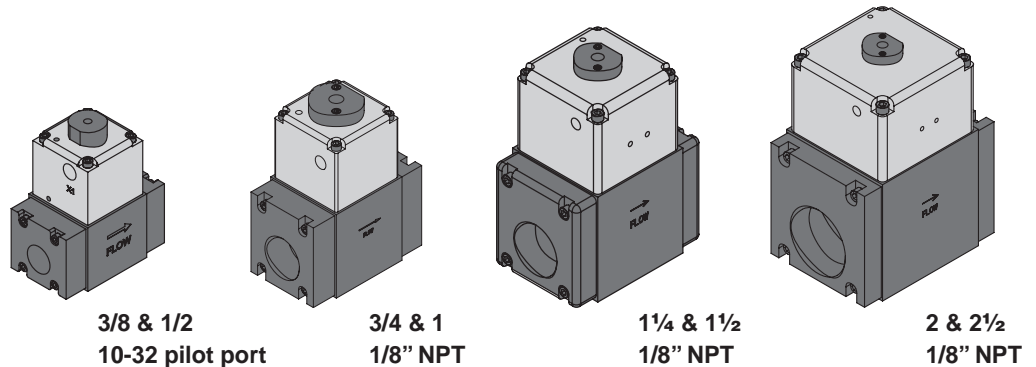
**Inlet Pressure:** Vacuum to 250 psig (17 bar).

**Pilot Pressure:** 30 to 145 psig (2 to 10 bar). Must be equal to or greater than inlet pressure. For vacuum service models requiring external pilot supply, a pilot pressure of at least 30 psig (2 bar) is required.

**Port Threads:** NPT, BSPP.

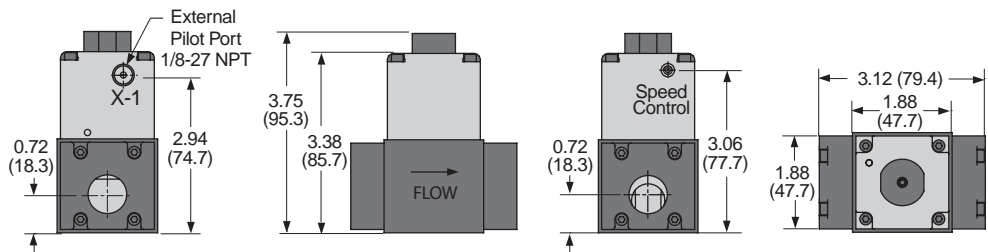
**Note:** For fluid applications, consult ROSS.

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

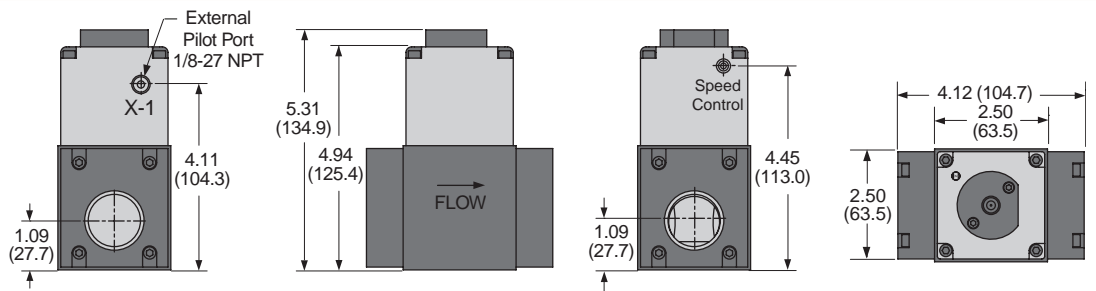


Valve Dimensions – inches (mm)

### Port Sizes: 3/8 & 1/2



### Port Sizes: 3/4 & 1

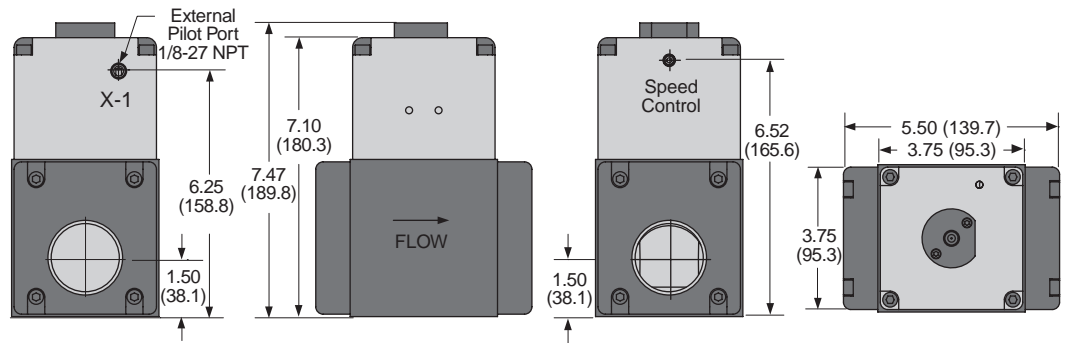




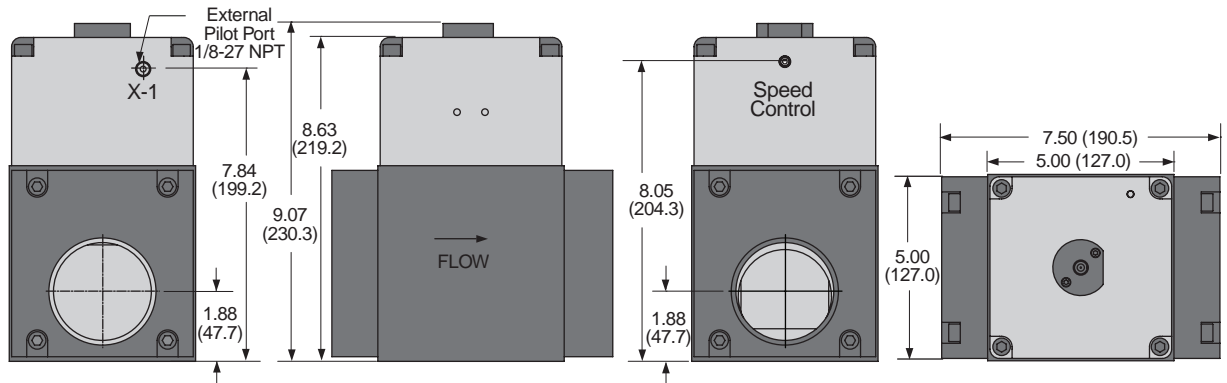
# Series LX Pressure Controlled Valves

Valve Dimensions – inches (mm)

Port Sizes: 1¼ & 1½

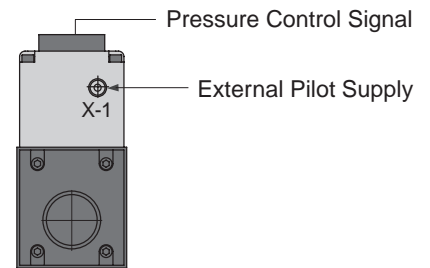


Port Sizes: 2 & 2½



## Additional Valve Information

**Note:** The Dale series pressure controlled valves require both an external pilot supply and a control signal to operate the valve. When a pressure control signal is applied the valve shifts to the open position.



## The LF & LX Advantage

The LF & LX Series provides superior performance over a diaphragm valve with a rugged poppet design, bi-directional flow and high cycle life.

The LF & LX Series provides superior performance over a ball valve with solenoid actuation, shifting speed, cycle life, and most important, a cost effective alternative.

Diaphragm  
Valve

Improved  
Performance



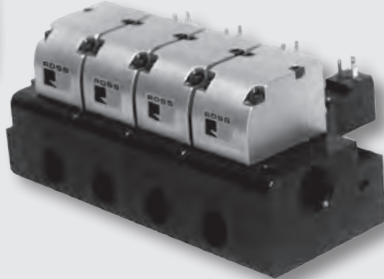
Cost  
Effective

Ball  
Valve

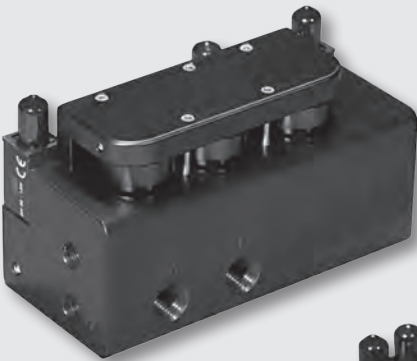
# Series CX & LT Leak Test Valves & Manifolds



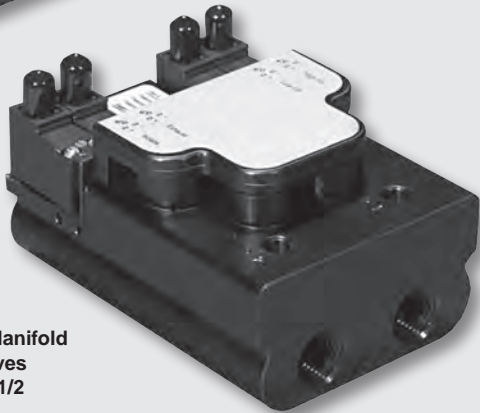
Series CP, CX Valve  
2/2 Valves  
Ports: 3/8 & 1/2



Series CX Manifold  
2/2 Valves  
Ports: 3/8 & 1/2



Series LT Manifold  
3/4 Valves  
Port: 1/4



Series LT Manifold  
5/4 Valves  
Port: 1/2

The Series CX Leak test Valves are available in 2/2 inline mount, and 2/2 stackable manifolds with 3/8" and 1/2" size ports. The series LT 3/4 are available with 1/4" ports or 4/4 and 5/4 with 1/2" size ports. The valve's internal 1/2" orifice has a flow range from 2.2 to 5.0 Cv.

These continuous-duty rated valves provide high-flow capability in a compact, low weight package and offer non-lube service for ease-of-use.

The Series CX & LT valves are part of a recent trend in leak test systems which utilize a new and innovative manifold block design. This unique configuration allows customers to leak test without added piping, which saves installation time and money and reduces cycle time. Its integrated flow and pressure sensor ports also decrease test volume and the need for extra fittings.

These valves offer customers a good value with their robust poppet construction. This bubble tight design provides excellent sealing capabilities and provides a long service life in dirty environments. The valve's independent internal poppet design also allows it to adapt to various system design requirements.

Because the Series LT design is leak tight, there is no leak path from pilot pressure to the test chamber, eliminating cross over leakage. Customers also benefit from the product's minimal energy consumption and reduced heating effects due to its low 1.2 watt solenoids.

In one application, the Series LT valves replaced an 18 watt product, instantly solving a customer's excessive heating effect problem.

## FEATURES:

- Cost effective
- Compact design
- Robust construction
- High flow
- Leak tight
- Non-Lube service
- Continuous duty rated
- Ease of maintenance and repair
- Repeatability throughout the life of the valve

## APPLICATIONS for Series CX:

- Pulp & Paper - Pulp slurries
- Steel Mills - Pickling slurries
- Vacuum Process
- Process Industry - Liquids

- Packaging - Food and chemical
- Blow Molding & Thermoforming
- Power Generation - Cooling water
- Industrial Mineral
- Automation - Leak Test (Series CX)
- General Purpose Process Solutions

## APPLICATIONS for Series LT:

- Pressure isolation or decay test
- Bypass fill or isolation valves

- Flow test
- Differential or two-channel pressure decay test

For flexible design application, the valves are port pressure independent and can be field configured for flow, pressure decay or differential pressure testing.

# Series CX Leak Test Valves & Manifolds

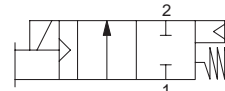
## Leak Test Valves

2/2 Valves, normally closed (NC) or normally open (NO)

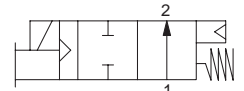
**Operator:** External pilot, solenoid actuated.

**Applications:** Directional control, Pressure isolation.

The CX 2/2 valve completes the product line with a leak tight high flow 2-way valve that is suitable for any application.



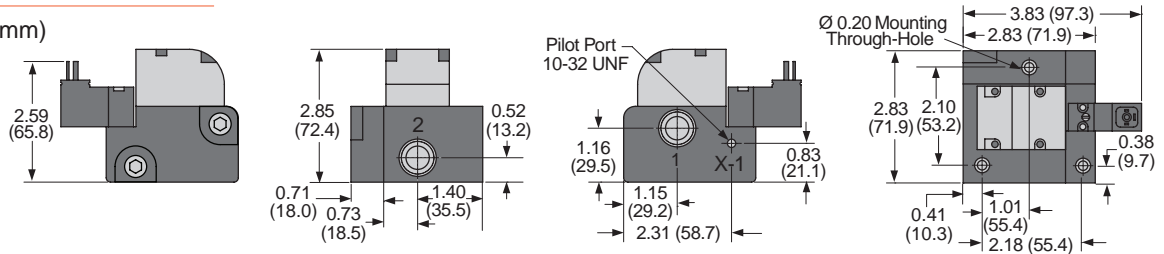
Normally Closed (NC)



Normally Open (NO)

Port Sizes		Valve Model Number*		Avg. $C_v$	Length	Dimensions inches (mm)		Height NO	Weight lb (kg)
1	2	NC	NO			Width	Height NC		
1/2	3/8	CX14NA37501W	CX24NA37501W	3.5	3.83 (97.3)	2.83 (71.9)	2.85 (72.4)	2.85 (72.4)	1.4 (0.6)
1/2	1/2	CX14NA47501W	CX24NA47501W	3.5	3.83 (97.3)	2.83 (71.9)	2.85 (72.4)	2.85 (72.4)	1.4 (0.6)

### Dimensions – inches (mm)



## Leak Test Manifolds

Complete valves-on-manifold assemblies can be ordered to fit your precise requirements.

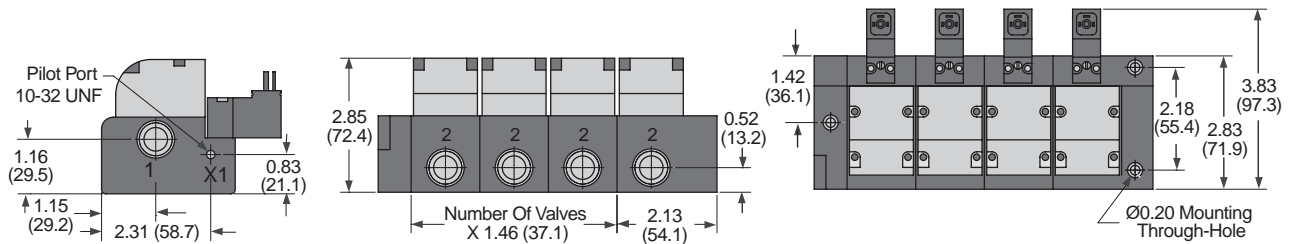
When ordering the Dale Series CX manifold valves with different valve functions, please see page 16 for ordering information.

**Operator:** External pilot, solenoid actuated.

**Applications:** Pressure Decay, Bypass Fill and Pressure isolation.

Port Sizes		Valve Model Number*		Avg. $C_v$
1	2	NC	NO	
<b>2/2 Solenoid Pilot Controlled</b>				
1/2	3/8	CX14NA3751XW	CX24NA3751XW	3.7
1/2	1/2	CX14NA4751XW	CX24NA4751XW	3.7

### Dimensions – inches (mm)



\* For the number of stations desired, replace "X" in the model number with the specific number of stations., e.g., CX14NA37516W (6-station assembly).

For 120 volts AC, 50/60 Hz, replace suffix "W" with "Z", e.g., CP14NA3750XZ.

For BSPP threads, replace "N" in the model number with a "D", e.g., CX14DA3750XW.

Electrical connectors not included, see page 7 for ordering information.

### STANDARD SPECIFICATIONS:

For Series CX Solenoid Pilot Controlled Valves.

**Pilot Solenoid:** DC power. Rated for continuous duty.

**Standard Voltages:** 24 volts DC; 120 volts AC, 50/60 Hz.

**Power Consumption:** *Per Solenoid:* 3 VA on AC; 2.5 watts on DC.

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

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

**Inlet Pressure:** Vacuum to 145 psig (10 bar).

**Pilot Pressure:** 30 to 145 psig (2 to 10 bar). Must be equal to or greater than inlet pressure. For vacuum service models a pilot pressure of at least 30 psig (2 bar) is required.

**Override:** Standard on 2/2 valves, 3/8" thru 1" bodies and 3/2 valves, 3/8" and 1/2" bodies. Non-Locking.

**Port Threads:** NPT, BSPP.

**Note:** For fluid applications, consult ROSS.

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

# Series LT Leak Test Valves & Manifolds

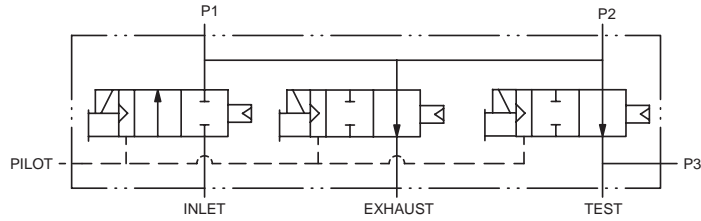
## 3/4 Manifolds

The LT 3/4 manifold has excellent flow, is compact and adaptable. This product can be field configured for flow, pressure decay, or differential pressure testing by selecting different combinations of the three sensor ports.

Manifold valve 3-port 4-position, normally closed.

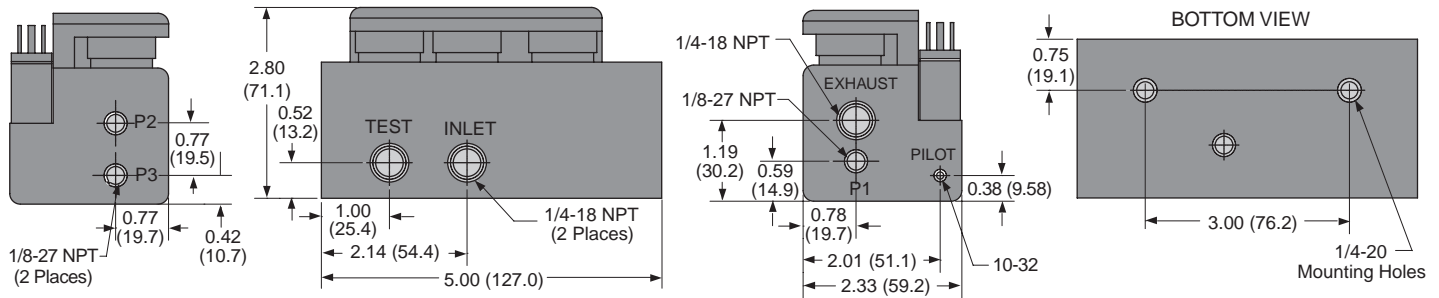
**Operator:** External pilot, multi solenoid actuated.

**Applications:** Single inlet for Decay, Flow, and Differential tests.



### Dimensions – inches (mm)

Port Size	Model Number	Avg. $C_v$	Dimensions inches (mm)			Weight lb (kg)	
			1	2	Normally Closed		Length
1/4	1/4	LT32NA27500W	2.2	5.00 (127.0)	2.33 (59.2)	2.80 (71.1)	2.9 (1.3)

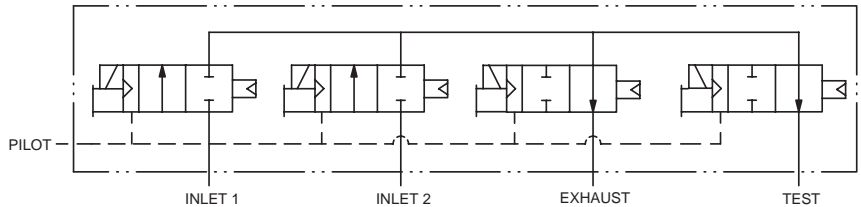


## 4/4 Manifolds

Manifold valve 4-port 4-position, normally closed.

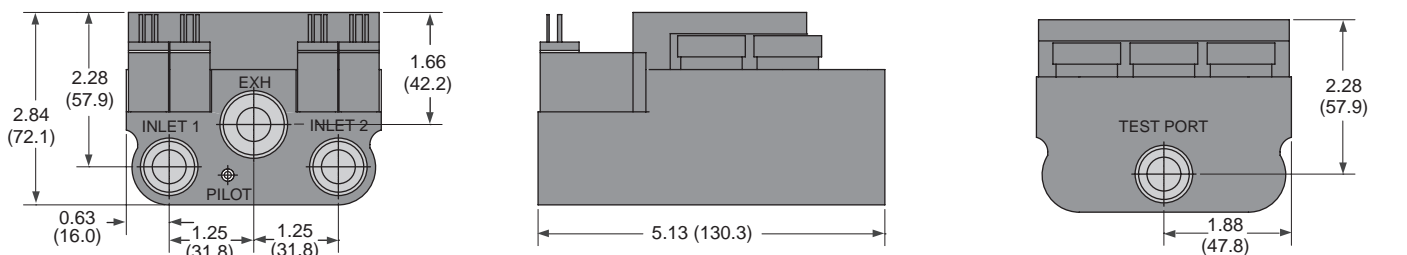
**Operator:** External pilot, multi-solenoid actuated.

**Applications:** Flow and Pressure Decay.



Port Size	Model Number	Avg. $C_v$	Dimensions inches (mm)			Weight lb (kg)	
			1	2	Normally Closed		Length
1/2	1/2	LT44NA47500W	5.0	5.13 (130.3)	3.75 (95.3)	2.84 (72.1)	3.2 (1.5)

### Dimensions – inches (mm)



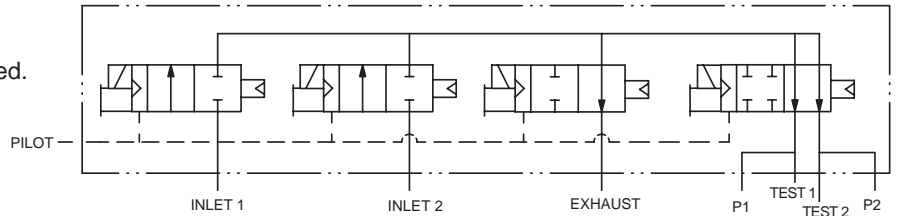
# Series LT Leak Test Valves & Manifolds

## 5/4 Manifolds

Manifold valve 5-port 4-position, normally closed.

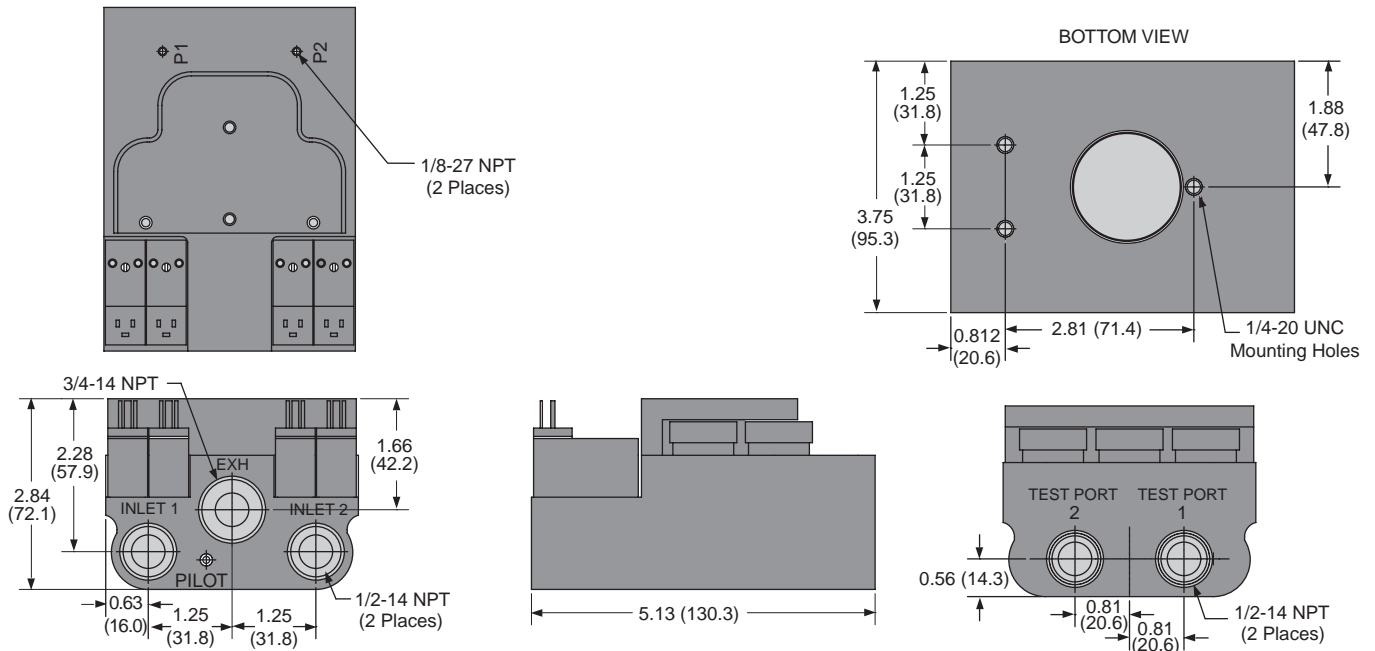
**Operator:** External piloted, multi-solenoid actuated.

**Applications:** Two channel Pressure Decay, Differential Pressure.



Port Size	Model Number	Avg. $C_v$	Dimensions inches (mm)			Weight	
1	2	Normally Closed	Length	Width	Height	lb (kg)	
1/2	1/2	LT54NA47500W	5.0	5.13 (130.3)	3.75 (95.3)	2.84 (72.1)	3.2 (1.5)

Dimensions – inches (mm)



The LT 4/4 and 5/4 manifolds are “all in one” directional control valves designed to fill, isolate, and test pressure containing vessels. All manifolds contain integrated sensor ports for flow, pressure decay or differential pressure testing. With dual inlet ports, and independent actuation of four internal poppets these manifolds also provide a flexible, high flow, compact air distribution solution for many other applications.

\* For 120 volts AC, 50/60 Hz, replace suffix “W” with “Z”, e.g., LT32NA27500Z.

Electrical connectors not included, see page 26 for ordering information.

### STANDARD SPECIFICATIONS:

For Series LT 3/4, 4/4, 5/4 Manifolds.

**Pilot Solenoid:** DC power. Rated for continuous duty.

**Standard Voltages:** 24 volts DC; 120 volts AC, 50/60 Hz.

**Power Consumption:**

*Per Solenoid:* 3 VA on AC; 2.5 watts on DC.

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

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

**Sensor Port:** 1/8 NPT sensor ports.

**Pilot Pressure:** 50 to 145 psi (3.4 to 10 bar). Must be equal to or greater than inlet pressure.

**Inlet Pressure:** 2 to 145 psi (0.13 to 10 bar).

**Port Threads:** NPT.

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



# Series LT Leak Test Valves & Manifolds

## ELECTRICAL CONNECTORS:

For Series LT Valves.



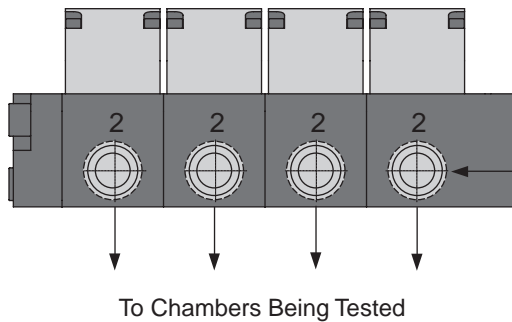
Valve Port Size	Part Numbers of Electrical Connectors			
	Lighted Connector Only		Lighted Connector Pre-wired*	
	24 volts DC	110 Volts AC	24 volts DC	110 Volts AC
1/4, 1/2	2306K77-W	2306K77-Z	2307K77-W	2307K77-Z

\*Pre-wired connectors include a 2 meter (6½ ft.) cord.

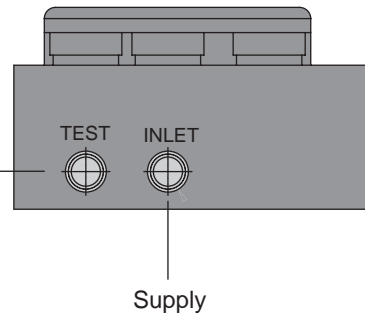
## Applications Examples

The Dale series CX and LT can be combined to simplify the most complex test circuits. The LT manifold with integrated sensor ports is the primary valve used for the fill, isolate and test functions. In this example the test port of the LT is connected to the CX manifold allowing four chambers to be tested one at a time. The flexibility of combining the LT and CX manifolds creates a compact package, reduces leak paths, and provides an all in one test solution.

Manifold Shown below:  
2/2 Valve, 4-Station, Normally Closed  
Port 1/2", 24 Volts DC  
CX14NA47514W

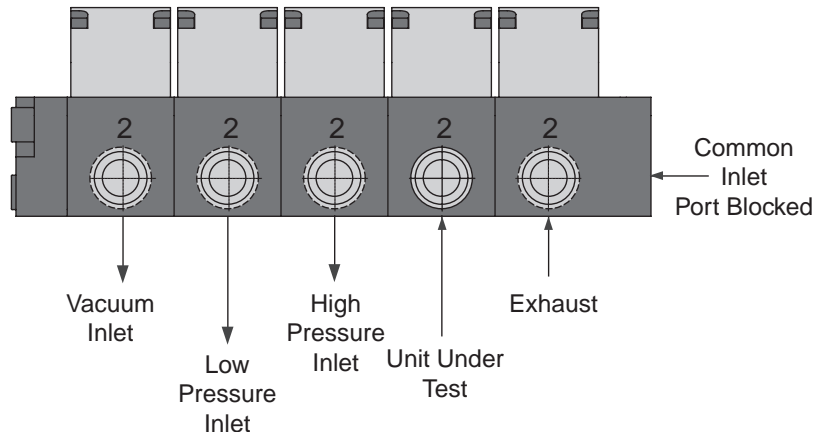


Manifold Shown below:  
3/4, Leak Test Manifold, 24 Volts DC  
LT32NA27500W



The CX series manifold port pressure independence and bidirectional flow capabilities allows the user to create a simple manifold solution for the most complex test circuits. The following example shows a test performing a vacuum test, followed by a low pressure test, and finishing with a high pressure test using a single CX manifold. The vacuum, low pressure and high pressure valves are NC (normally closed). The isolation and exhaust valves are NO (normally open), allowing the valve to go to a safe mode if power is cut.

**Note:** Once the unit under test is filled and the isolation poppet is closed the pressure or vacuum in the common valve chamber can be exhausted. This prevents the possibility of leak up that could cause the unit under test to pass a test it should have failed.





# Cautions



## PRE-INSTALLATION or SERVICE

1. Before servicing a valve or other pneumatic component, be sure that all sources of energy are turned off, the entire pneumatic system is shut off and exhausted, and all power sources are locked-out (ref: OSHA 1910.147, EN 1037).
2. All ROSS products, including service kits and parts, should be installed and/or serviced only by persons having training and experience with pneumatic equipment. Because any installation can be tampered with or need servicing after installation, persons responsible for the safety of others or the care of equipment must check every installation on a regular basis and perform all necessary maintenance.
3. All applicable instructions should be read and complied with before using any fluid power system in order to prevent harm to persons or equipment. In addition, overhauled or serviced valves must be functionally tested prior to installation and use.
4. 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.

## FILTRATION and LUBRICATION

5. Dirt, scale, moisture, etc. are present in virtually every air system. Although some valves are more tolerant of these contaminants than others, best performance will be realized if a filter is installed to clean the air supply, thus preventing contaminants from interfering with the proper performance of the equipment. ROSS recommends a filter with a 5-micron rating for normal applications.
6. All standard ROSS filters and lubricators with polycarbonate plastic bowls are designed for compressed air applications only. Do *not* fail to use the metal bowl guard, where provided, to minimize danger from high pressure fragmentation in the event of bowl failure. Do not expose these products to certain fluids, such as alcohol or liquefied petroleum gas, as they can cause bowls to rupture, creating a combustible condition, hazardous leakage, and the potential for human injury. 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 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 and/or human injury. If you have questions regarding whether a lubricant used on your system is compatible with ROSS products, please contact ROSS.

## AVOID INTAKE/EXHAUST RESTRICTION

8. Do not restrict the air flow in the supply line. To do so could reduce the pressure of the supply air below the minimum requirements for the valve and thereby cause erratic action.
9. Do not restrict a valve's exhaust port as this can adversely affect its operation. Exhaust silencers must be resistant to clogging and 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 inadequately maintained silencer installed with a ROSS product.*

## POWER PRESSES

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

## ENERGY ISOLATION/EMERGENCY STOP

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

# WARRANTY

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

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