

Dale Series CX, LT Leak Test Solenoid Pilot Valve & Manifolds - *A Model*



Thank You!

You have purchased a premium-quality ROSS pneumatic valve. It is a leak test, compact solenoid pilot valve designed with metal internals, and has been built to the highest standards. With care in its installation and maintenance, you can expect it to have a long and economical service life. So before you go any further, please take a few minutes to look over the information in this folder. Then save it for future reference and for the useful service information it contains. A general service manual with more detailed information is available from ROSS upon request.

VALVE INSTALLATION

Please read and make sure you understand all installation instructions before proceeding with the installation.

Additional technical documentation is available for download at www.rosscontrols.com.

If you have any questions about installation or servicing your valve, please contact ROSS or your authorized ROSS distributor, see contact information listed at the back of this document, or visit www.rosscontrols.com to find your distributor.

CX Series Valves and Manifolds

The CX series valves combines the flexibility of a standard 2-way or 3-way valves with the added benefits of high flow and zero leakage. The valve can be used as a bypass valve or as a zero leak isolation valve for a leak test circuit.

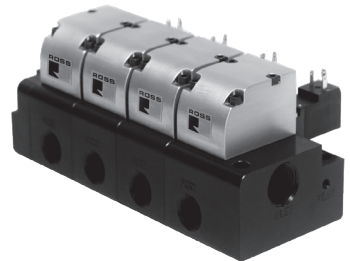
The CX stackable manifold can be ordered with normally open or normally closed valves on the same manifold.

Pilot Pressure: Pilot pressure must be maintained at all times, and must be equal to or greater than the inlet pressure to prevent valve failure. To prevent loss of pilot pressure, it is strongly recommended to use the same air supply for both the inlet and pilot pressures.

Normally Closed – For the CX normally closed 2-way valve. The supply pressure on the "1" port is closed.

Electrical Power Loss: Will cause the normally closed version valve to return to a closed position. Downstream line pressure will not be exhausted. The normally open version valve will return to the open position.

Operation: The CX valve can have vacuum or pressure on either, the port 1 or port 2.

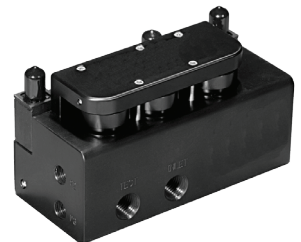


3/4 Manifold

The 3/4 LT series manifold was designed for test applications currently using standard 3-way and 2-way valves.

Benefits include: high flow, zero isolation leakage and elimination of tubing. The manifold can be configured for flow tests, pressure decay tests and differential pressure tests.

The manifold consists of three internal high flow poppets which are actuated by three external solenoids. The first solenoid controls the supply pressure, the second solenoid controls the isolation and the third controls the exhaust. Independent operation of these functions provides exceptional flexibility and eliminates the need for two separate valves.



VALVE INSTALLATION

The supply pressure poppet is normally closed and the exhaust poppet is normally open. Therefore, if power is lost or if a safety stop has cut power, the supply pressure will be closed and the unit under test will be evacuated.

Pilot Pressure: Pilot pressure must be maintained at all times and must be equal to or greater than the inlet pressure to prevent valve failure. To prevent loss of pilot pressure, it is strongly recommended to use the same air supply for both the inlet and pilot pressures.

Normally Closed - The LT is a normally closed 4-way valve. The "INLET" port is normally closed and the "TEST", "P1", "P2" and "P3" ports flow through the "EXHAUST" port.

Electrical Power Loss: Will cause the valve to return to a normally closed position. The inlet pressure will be closed and downstream test pressure will be exhausted.

Operation: Pressure Decay Test

- Step 1 - Close the exhaust by actuating the exhaust solenoid.
- Step 2 - Open inlet pressure by actuating the fill solenoid.
- Step 3 - Allow time to fill and settle.
- Step 4 - Close the isolation poppet by actuating the isolation solenoid.
- Step 5 - Close the inlet pressure by deactivating the fill solenoid.
- Step 6 - Exhaust the valve cavity pressure by deactivating the exhaust solenoid.
- Step 7 - Monitor pressure drop on port "P3" to determine if there is a leak.
- Step 8 - Exhaust the part under test by deactivating the isolation solenoid.

Flow Test: Follow steps 1 through 4 from above.

Step 5 - Monitor flow from port "P2" to port "P3". ("P2" connected to flow sensor inlet, "P3" connected to flow sensor outlet.)

Step 6 - Close the inlet pressure by deactivating the fill solenoid.

Step 7 - Exhaust the part under test by deactivating the isolation and exhaust solenoids.

Differential Pressure Test: Follow steps 1 through 5 from above.

Step 6 - Monitor the difference in pressure between ports "P2" and "P3". ("P2" reflects test part pressure, "P3" reflects ref volume pressure)

Step 7 - Exhaust the part under test and the reference volume by deactivating the isolation and exhaust solenoids.

Applications: • Pressure Decay Test: P1 - Blocked, P2 - Blocked, P3 - Pressure Sensor Port • Flow Test: P1 - Blocked, P2 - Flow Sensor Inlet Port, P3 - Flow Sensor Outlet Port • Differential Pressure Test: P1 - Reference Volume Fill Port, P2 - Pressure Sensor Port 1, P3 - Pressure Sensor Port 2.

4/4 & 5/4 Manifolds

The 4/4 and 5/4 LT series manifolds provide a complete pneumatic control for applications requiring two supply lines. Benefits include: high flow, zero isolation leakage and elimination of tubing. The manifold can

be configured for flow tests, pressure decay tests and differential pressure tests.

The manifold consists of four internal high flow poppets which are actuated by four external solenoids. Two solenoids control the supply pressure, the second solenoid controls the isolation and the third controls the exhaust. Independent operation of these functions supports many applications including: dual pressure tests, vacuum and fill tests or over fill and relieve tests. The supply pressure poppets are normally closed and the isolation and exhaust poppets are normally open. Therefore, if power is lost or if a safety stop has cut power, the supply pressure will be closed and the unit under test will be evacuated.

Applications: • Pressure Decay Test: P1 - Pressure Sensor Port • Flow Test: P1 - Pressure Sensor Port, P2 - Flow Sensor Inlet Port, P3 - Flow Sensor Outlet Port • Differential Pressure Test: P1 - Pressure Sensor Port 1, P2 - Pressure Sensor Port 2



VALVE MAINTENANCE

Pneumatic equipment should be maintained only by persons trained and experienced in the maintenance of such equipment.

Supply Clean Air. Foreign material lodging in valves is a major cause of breakdowns. The use of a 5-micron rated air filter located close to the valve is strongly recommended. The filter bowl should be drained regularly, and if its location makes draining difficult, the filter should be equipped with an automatic drain.

Check Lubricator Supply Rate. A lubricator should put a fine oil mist into the air line in direct proportion to the rate of air flow. Excessive lubrication can cause puddling in the valve and lead to malfunctions. For most applications an oil flow rate in the lubricator of one drop per minute is adequate (note that this valve itself does not require air line lubrication, but some optional adaptors do, i.e., air index, etc.).

Compatible Lubricants. Although this valve does not require air line lubrication, it may be used with lubricated air being supplied to other mechanisms. Some oils contain additives that can harm seals or other valve components and so cause the valve to malfunction. Avoid oils with phosphate additives (e.g., zinc dithiophosphate), and diester oils; both types can harm valve components. The best oils to use are generally 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.

Some compatible oils are listed above at the right. These oils, although believed to be compatible, could change without notice because manufacturers sometimes reformulate their oils. Therefore, use oils specifically compounded for air line service. If it is a synthetic oil, contact the oil manufacturer for compatibility information.

COMPATIBLE LUBRICANTS

Maker	Brand Name
Amoco	American Industrial Oil 32; Amoco, Spindle Oil C; Amolite 32
Citgo	Pacemaker 32
Exxon	Spinesstic 22; Teresstic 32
Mobil	Velocite 10
Non-Fluid Oil	Air Lube 10H/NR
Shell	Turbo T32
Sun	Sunvis 11; Sunvis 722
Texaco	Regal R&O 32
Union	Union Turbine Oil

Cleaning the Valve. If the air supplied to the valve has not been well filtered, the interior of the valve may accumulate dirt and varnish which can affect the valve's performance.

A schedule should be established for cleaning all valves, the frequency depending on the cleanliness of the air being supplied.

To clean the valve use any good commercial solvent. Do *not* scrape varnished surfaces. Also do not use chlorinated solvents or abrasive materials. The former damages seals, and abrasives can do permanent damage to metal parts. Before reassembling the valve, lubricate all sliding surfaces with a grease such as Dow Corning BR2-Plus.

Electrical Contacts. In the electrical circuits associated with the valve solenoids, keep all switches or relay contacts in good condition to avoid solenoid malfunctions.

Replace Worn Components. In some cases it is not necessary to remove the valve from its installation for servicing. However, turn off the electrical power to the valve, shut off the air supply, and exhaust the air in the system before beginning any disassembly operation.

VALVE SERVICE

ROSS would be happy to service this valve for you at its factory repair center. If you purchased your valve from ROSS please contact ROSS customer service, if you purchased your valve thru an authorized ROSS distributor please contact the distributor for return instructions.

However, if you choose to service this valve yourself, it is strongly recommended that you visit our website at www.rosscontrols.com for available downloadable technical documentation.

VALVE SPECIFICATIONS

Pilot Solenoid: DC power. Rated for continuous duty.

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

Power Consumption:

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

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, BSPP.

IMPORTANT NOTE: Please read carefully and thoroughly all the **WARNINGS** and **CAUTIONS** on page 4.

CAUTIONS And WARNINGS



PRE-INSTALLATION or SERVICE

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

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

FILTRATION and LUBRICATION

5. Dirt, scale, moisture, etc. are present in virtually every air system. Although some valves are more tolerant of these contaminants than others, best performance will be realized if a filter is installed to clean the air supply, thus preventing contaminants from interfering with the proper performance of the equipment. ROSS recommends a filter with a 5-micron rating for normal applications.
6. All standard ROSS filters and lubricators with polycarbonate plastic bowls are designed for compressed air applications only. Do *not* fail to use the metal bowl guard, where provided, to minimize danger from high pressure fragmentation in the event of bowl failure. Do not expose these products to certain fluids, such as alcohol or liquefied petroleum gas, as they can cause bowls to rupture, creating a combustible condition, hazardous leakage, and the potential for human injury or damage to property. Immediately replace a crazed, cracked, or deteriorated bowl. When bowl gets dirty, replace it or wipe it with a clean dry cloth.

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

AVOID INTAKE/EXHAUST RESTRICTION

8. Do not restrict the air flow in the supply line. To do so could reduce the pressure of the supply air below the minimum requirements for the valve and thereby cause erratic action.
9. Do not restrict a valve's exhaust port as this can adversely affect its operation. Exhaust silencers must be resistant to clogging and must have flow capacities at least as great as the exhaust capacities of the valves. Contamination of the silencer can result in reduced flow and increased back pressure.

WARNINGS:

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

POWER PRESSES

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

ENERGY ISOLATION/EMERGENCY STOP

11. Per specifications and regulations, ROSS **L-O-X®** 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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