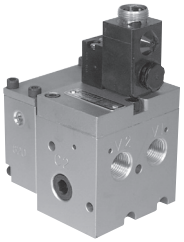
27 Series Pilot Operated Check Valves

Thank You!

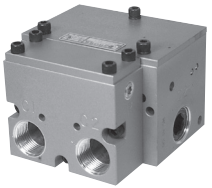
You have purchased a premium-quality ROSS® pneumatic valve. It is a pilot operated check valve with poppet internals, and has been built to the highest standards.

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.

Single PO Check



Dual PO Check Solenoid Controlled



Dual PO Check

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.

Pneumatic equipment should be installed only by persons trained and experienced in such installation.

Air Lines: Before installing a valve in a new or an existing system, the air lines must be blown clean of all contaminants. It is recommended that an air filter be installed in the inlet line close to the valve.

Valve Inlet(s) (V1, V2, or VLV): Inlet ports (some valves have two inlets) should be connected to the outlet(s) of the directional valve (typically ports 2 and/or 4). Be sure that the supply line is of adequate size and does not restrict the air supply because of a crimp in the line, a sharp bend, or a clogged filter element.

Valve Outlet(s) (C1, C2, or CYL): Outlet ports (some valves have two outlets) should be connected to cylinder port(s). For faster pressurizing and exhausting of the cylinder being operated by the valve, locate the check valve as close as possible to the cylinder. The connecting lines must be of adequate size and be free of crimps and sharp bends (unrestrictive).

Valve Exhausts and Vents: Do not restrict the air flow from the exhaust or vent ports of the valve body or pilot body as this can adversely affect the operation of the valve.

Electrical Supply: The voltage and hertz ratings of the valve solenoids (if any) are shown on the pilot housing. The electrical supply must correspond to these ratings. Failure to use an electrical supply of the correct voltage and amperage may result in incorrect operation of the valve. See *Valve Specifications* on page 2 for information on inrush current.

Operating Pressures and Temperatures: Allowable ranges for pressure and temperatures are given in the *Valve Specifications* on page 2. Exceeding the values shown can shorten valve life.

Remote Trapped Pressure Relief: Pilot operated check valves designated for remote trapped pressure relief function (blowdown) require a 1/8-inch supply line to be connected to port P (or port BP where provided). As long as pressure is available at port P (or port BP), the check valve operates normally. Loss of pressure at port P (or port BP) will cause the check valve to relieve trapped pressure. Also, see Pilot Supply below for Solenoid Control.

Pilot Supply:

Pressure Control: Connect a 1/8-inch (1/4-inch on Type B valves) control line to the threaded port in the air cap (labeled VP on some models) at the top of the valve. See *Valve Specifications* on page 2 for required pressures.

Solenoid Control: Pressure for the pilot valve is supplied externally and requires a 1/8-inch pilot supply line connected to port P in the valve. See *Valve specifications* on page 2 for pressure requirements. Loss of pressure to port P during operation will cause the check valve to relieve trapped pressure.

Pipe Installation: To install pipe in valve ports, engage pipe one turn, apply pipe thread sealant (tape not recommended), and tighten pipe. This procedure will prevent sealant from entering and contaminating the valve.

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.

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.

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

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 MobilGrease 28.

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, 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) before beginning any disassembly operation. Service kits for these valves are listed on page 3.

VALVE SPECIFICATIONS

Pressure Controlled Pilot Operated Check Valves WITHOUT Trapped Pressure Relief Function

Construction: Poppet.
Mounting Type: In-Line.
Ambient/Media Temperature:
40° to 175°F (4° to 80°C).
Flow Media: Filtered air.
Inlet Pressure:
15 to 150 psig (1.0 to 10.3 bar).
Signal Pressure: Must be equal to or greater than inlet pressure.

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

Solenoid Pilot Operated Check Valves *WITH* Trapped Pressure Relief Function

Construction: Poppet.
Mounting Type: In-Line.
Solenoids: AC or DC power. Rated for continuous duty.
Standard Voltages: 24 volts DC; 110-120 volts AC, 50/60 Hz.
Power Consumption: 8 VA inrush, 6 VA holding on AC; on DC 4.5 watts with 4-pin Micro connector, 60 watts with 3-pin connector.
Ambient Temperature: 40° to 120°F (4° to 50°C).
Media Temperature: 40° to 175°F (4° to 80°C).
For Internal Pilot Models, Ambient/Media range: 40° to 175°F (4° to 80°C).
Inlet Pressure: 30 to 150 psig (2 to 10 bar).
Pilot Pressure: Must be equal to or greater than inlet pressure.

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.

When servicing the valve yourself, be sure to turn off electrical power to the valve, shut off the air supply, exhaust the air in the system, and lock-out all power sources before beginning any disassembly operation. Listed below are kits for servicing your valve, as well as replacement components.

Valve Body Service Kits.

These kits contain all parts needed for complete reconditioning of a valve body. Included are poppets, spindle, all required gaskets and seals, and instructions for use.

Blow-Down Service Kits.

These kits contain all parts needed for complete reconditioning of a blow-down adaptor. Included are inserts, all required gaskets and seals, and instructions for use.

Replacement Solenoid Pilot Assemblies.

These kits contain replacement solenoid assemblies. See the chart below.

Solenoid Coils. Replacement solenoid coils can be ordered by the part numbers listed in the chart below.

Valve Model	Solenoid Assembly	Coil Only
2778C3900	851C79*	306K33*
2778C3901	976C79*	316K33*
2778C3902	976C7916	316K3316
2778C3904	1086C7916	322K3316
2778C4900	851C79*	306K33*
2778C4901	976C79*	316K33*
2778C4902	976C7916	316K3316
2778C4904	1086C7916	322K3316
2778C5900	851C79*	306K33*
2778C5901	976C79*	316K33*
2778C5902	976C7916	316K3316
2778C5904	1086C7916	322K3316
2778A6900	851C79*	306K33*
2778A6901	976C79*	316K33*
2778A6902	976C7916	316K3316
2778A6904	1086C7916	322K3316

* Specify the required voltage and hertz when ordering.

If you have any questions about installing or servicing your valve, call ROSS *Technical Services* at your nearest ROSS location (see page 4) or in the U.S.A. at: **1-888-TEK-ROSS(835-7677).**

Valve Model	Port Size	Valve Type	Valve Body Kit Number	Blow-Down Kit Number
2751A2903	1/4	B	1671K77	–
2751A2908	1/4	A	1267K77	–
2751A3901	3/8	B	1671K77	–
2751A3908	3/8	A	1267K77	–
2751A3922	3/8	F	1952H77	–
D2751A3922	G 3/8	F	1952H77	–
2751A4902	1/2	B	1671K77	–
2751A4905	1/2	B	1679K77	–
2751A4915	1/2	A	1267K77	–
2751A4922	1/2	F	1952H77	–
D2751A4922	G 1/2	F	1952H77	–
2751A5903	3/4	B	1679K77	–
2751A5917	3/4	F	1953H77	–
2751A6901	1	B	1679K77	–
2751B6904	1	B	1678K77	–
2751B7901	1¼	B	1678K77	–
2751B8902	1½	B	1678K77	–
2768C3900	3/8	C	1263K77	–
2768C3901	3/8	D	1263K77	404H77
2768C3904	3/8	D	1263K77	1704H77
2768C4900	1/2	C	1535H77	–
2768C4901	1/2	D	1535H77	404H77
2768C4904	1/2	D	1535H77	1704H77
2768C5900	3/4	C	1264K77	–
2768C5901	3/4	D	1264K77	404H77
2768C5904	3/4	D	1264K77	1704H77
2768A6900	1	C	1264K77	–
2768A6901	1	D	1264K77	404H77
2768A6904	1	D	1264K77	1704H77
2778C3900	3/8	E	1263K77	404H77
2778C3901	3/8	E	1263K77	404H77
2778C3902	3/8	E	1263K77	404H77
2778C3904	3/8	E	1263K77	404H77
2778C4900	1/2	E	1535H77	404H77
2778C4901	1/2	E	1535H77	404H77
2778C4902	1/2	E	1535H77	404H77
2778C4904	1/2	E	1535H77	404H77
2778C5900	3/4	E	1264K77	404H77
2778C5901	3/4	E	1264K77	404H77
2778C5902	3/4	E	1264K77	404H77
2778C5904	3/4	E	1264K77	404H77
2778A6900	1	E	1264K77	404H77
2778A6901	1	E	1264K77	404H77
2778A6902	1	E	1264K77	404H77
2778A6904	1	E	1264K77	404H77

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.

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