

W70 Series ANSI Valves



Thank You!

You have purchased a premium-quality ROSS® pneumatic valve. It is a stainless-steel spool-and-sleeve valve 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 document. Then, save it for future reference and for the useful service information it contains.



ROSS W70 Series valves and bases
(bases sold separately).

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 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 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 Ports: Your valve is a multipurpose valve and may have any of its ports restricted and/or pressurized provided there is sufficient pilot pressure. Conventional port usage is identified below.

Valve Inlet (Port 1): Be sure that the supply line is of adequate size and does not restrict the air supply because of a crimp in the line, sharp bends, or a clogged filter element.

Valve Outlets (Ports 2 & 4): For faster pressurizing and exhausting of the mechanism being operated by the valve, locate the valve as close as possible to the mechanism. The lines must be of adequate size and be free of crimps and sharp bends.

Valve Exhausts (Ports 3 & 5): These ports may be restricted to control cylinder speed. To reduce exhaust noise use an efficient silencer. ROSS silencers reduce impact noise by as much as 25 dB, and produce little back pressure.

Electrical Supply: The voltage and hertz ratings for solenoid pilot-operated valves can be found on the side of each pilot housing. Ensure that the electrical supply used is equal to these ratings to avoid solenoid burnout. The electrical connection for these valves is achieved at the base to valve interface by means of mating connectors.

If power is supplied by a transformer it must be capable of handling the inrush current without significant voltage drop. See *Valve Specifications* on page 2 for information on in-rush 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.

Pilot Supply:

Pressure Control: For valves with single remote pressure control, connect the control line to port 14 in the sub-base or manifold. For valves with double remote pressure control, connect the control lines to both ports 12 and 14 in the base. See *Valve Specifications* on page 2 for required pressures.

Solenoid Control: Pressure for the pilot valves is supplied from the inlet port. Be sure that the external pilot supply port in the base is plugged or pilot air will escape.

If the valve must operate with an inlet pressure less than the required pilot pressure (see *Valve Specifications* on page 2), an external pilot supply must be provided. Connect to the appropriate port in the base.

Vacuum or Non-Air Service: Such applications require an external pilot supply for solenoid valves. Connect to the appropriate port in the base.

Pipe Installation: To install pipe in valve or base 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.

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.

To clean the valve use a solvent which will dry without leaving a residue. This is especially important for the spool-and-sleeve assembly. Do not use a chlorinated solvent or abrasive materials. The former damages seals and abrasives can do permanent harm to metal parts.

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

To reassemble the spool and sleeve put one drop of Anderol 735 (or equivalent lubricant) on each spool land. Insert the spool into the sleeve and rotate it several times to ensure even distribution of the lubricant. If the valve is used in a non-lubricated application, do not use a lubricant for reassembly which can dry out and leave a residue. Dry assembly of the spool and sleeve is preferable. Each spool and sleeve is a matched set, so care must be taken not to reverse the position of the spool in the sleeve. Before inserting the spool-and-sleeve into the valve body, very lightly lubricate the O-rings with a compatible lubricant. *Do not use Anderol; it causes the O-rings to deteriorate.*

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. Service kits for these valves are listed on page 3.

VALVE SPECIFICATIONS

Construction Design	Spool and Sleeve
Mounting Type	Base
Flow Media	Filtered air
Construction Material	Valve Body: Cast Aluminum Spool: Stainless Steel Seals: Buna-N

Pressure Controlled Valves	
Temperature	Ambient/Media: 40° to 175°F (4° to 80°C) <i>For other temperature ranges, consult ROSS.</i>
Operating Pressure	Vacuum to 150 psig (10 bar) Pilot Supply - External: ANSI Size 1 & 20: Minimum 30 psig (2 bar) ISO Size 2.5, 4 & 10: Minimum 15 psig (1 bar) <i>Pilot supply pressure must be equal to or greater than inlet pressure.</i>

Solenoid Pilot Controlled Valves	
Solenoids	Rated for continuous duty. AC power; DC for ANSI size 1 models only.
Voltage	24 volts DC; 110-120 volts AC, 50/60 Hz

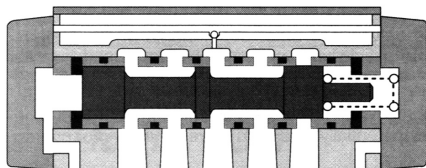
Power Consumption (each solenoid)	Solenoid Pilot models ANSI Size 1: 10 VA inrush, 24 VA holding on 50 or 60 Hz; 5 watts on DC. Solenoid Pilot models ANSI Size 2.5, 4, 10 & 20: 87 VA inrush, 55 VA holding on 50 or 60 Hz; 14 watts on DC. Direct Solenoid Pilot models ANSI Size 1: 140 VA inrush, 30 VA holding on 50 or 60 Hz; 20 watts on DC. Direct Solenoid Pilot models ANSI Size 2.5, 4, 10 & 20: 380 VA inrush, 79 VA holding.
Temperature	Ambient: 40° to 120°F (4 to 50°C) Media: 40° to 175°F (4° to 80°C) <i>For other temperature ranges, consult ROSS.</i>
Pilot Supply	Internal or External
Operating Pressure	Vacuum to 150 psig (10 bar) Pilot Supply - Internal or External: ANSI Size 1 & 20: Minimum 30 psig (2 bar) ISO Size 2.5, 4 & 10: Minimum 15 psig (1 bar) <i>When external pilot supply, pressure must be equal to or greater than inlet pressure.</i>
Manual Override	Flush; Rubber, non-locking

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

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.



Typical cross section of a ROSS W70 Series spool-&-sleeve valve body. Spring return model shown.

Listed below and in the chart at the right are the service kits and other parts required to repair or refurbish W70 Series valves.

Valve Body Service Kits. These kits contain all parts needed for a complete reconditioning of a valve body. Included are a spool-and-sleeve assembly, all required gaskets and seals, detent assemblies for valves requiring them, and instructions for use. Order by the part number given in the chart at the right.

Valve-to-Base Gasket. If your valve is removed from its base for any reason, a new valve-to base gasket must be used to ensure a leak-free seal. (This gasket is already included as a part of valve body service kits.) Order by the part number given in the chart at the right.

Solenoid Pilot Kits: These kits contain all parts needed to recondition the pilot valve. Order by the following kit numbers:

Pilots using solenoid 304B33:

Kit Number: **714K77**

Pilots using solenoid 347B04 or 411B04:

Kit Number: **946K87**

Solenoids: Replacement solenoids can be ordered by the part numbers given in the chart at the right. Specify the correct voltage and hertz when ordering.

*Solenoid pilot models shown on the right have internal pilot supply, and their model numbers all end in the digits "1" or "2." Corresponding model numbers for external pilot supply end in the digits "3" or "4," and use the same kits as the internal supply models.

Valve Model Number*	Valve Body Service Kit	Gasket & Seal Kit	Valve-Base Gasket	Solenoid Number
W7016A2331	708K77	—	553B11	171C95
W7016A2332	709K77	—	553B11	171C95
W7016A3331	276K87	305A87	549B11	349B04
W7016A3332	277K87	305A87	549B11	349B04
W7016C4331	W742K87	W769A87	958B11	349B04
W7016C4332	W743K87	W769A87	958B11	349B04
W7017A2331	1059K77	—	553B11	171C95
W7017A2332	275K87	—	553B11	171C95
W7017A3331	279K87	305A87	549B11	349B04
W7017A3332	282K87	305A87	549B11	349B04
W7017C4331	W744K87	W769A87	958B11	349B04
W7017C4332	W745K87	W769A87	958B11	349B04
W7056A2331	708K77	—	553B11	—
W7056A2332	—	—	553B11	—
W7056A3331	276K87	305A87	549B11	—
W7056A3332	277K77	305A87	549B11	—
W7056B4331	W742K87	W769A87	356B11	—
W7056B4332	W743K87	W769A87	356B11	—
W7056A6331	W746K87	W770A87	344B11	—
W7056A6332	W747K87	W770A87	344B11	—
W7056A8331	W750K87	W771A87	339C11	—
W7056A8332	W751K87	W771A87	339C11	—
W7057A2331	—	—	553B11	—
W7057A2332	275K87	—	553B11	—
W7057A3331	279K87	305A87	549B11	—
W7057A3332	282K87	305A87	549B11	—
W7057B4331	W787K87	W769A87	958B11	—
W7057B4332	W788K87	W769A87	958B11	—
W7057A6331	W748K87	W770A87	344B11	—
W7057A6332	W749K87	W770A87	344B11	—
W7057A8331	W752K87	W771A87	339C11	—
W7057A8332	W753K87	W771A87	339C11	—
W7076A2331	708K77	—	553B11	304B33
W7076A2332	709K77	—	553B11	304B33
W7076A3331	276K87	305A87	549B11	347B04
W7076A3332	277K87	305A87	549B11	347B04
W7076D4331	W742K87	W769A87	958B11	411B04
W7076D4332	W743K87	W769A87	958B11	411B04
W7076C6331	W746K87	W770A87	344B11	411B04
W7076C6332	W747K87	W770A87	344B11	411B04
W7076C8331	W750K87	W771A87	339C11	411B04
W7076C8332	W751K87	W771A87	339C11	411B04
W7077A2331	—	—	553B11	304B33
W7077A2332	275K87	—	553B11	304B33
W7077A3331	279K87	305A87	549B11	347B04
W7077A3332	282K87	305A87	549B11	347B04
W7077D4331	W744K87	W769A87	958B11	411B04
W7077D4332	W745K87	W769A87	958B11	411B04
W7077C6331	W748K87	W770A87	344B11	411B04
W7077C6332	W749K87	W770A87	344B11	411B04
W7077C8331	W752K87	W771A87	339C11	411B04
W7077C8332	W753K87	W771A87	339C11	411B04

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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