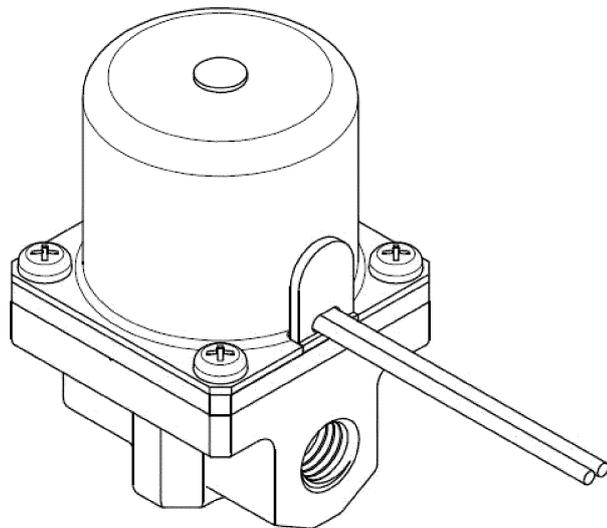


Instruction Manual Multilex Valve AB2 Series



- Be sure to read this instruction manual before using the product.
- In particular, read the safety instructions carefully.
- Keep this instruction manual in a safe place so that it can be taken out and read immediately when needed.

3rd Edition

CKD

To Use This Product Safely

When designing and manufacturing equipment using our company's products, you have an obligation to check that safety can be ensured for the systems operated by the equipment's mechanical mechanisms, air pressure control circuits, or water control circuits and for the electrical controls that control them, and to manufacture safe equipment.

To use our products safely, it is important to select, use, and handle them properly, and perform proper maintenance management for them.

To ensure the safety of equipment, be sure to observe the warnings and precautions.

Furthermore, we ask that you check that safety can be ensured for equipment and manufacture safe equipment.



Warning

- 1. This product has been designed and manufactured as equipment and a component for general industrial machinery. Therefore, handling should be performed by persons with sufficient knowledge and experience.**

- 2. Be sure to use the product within its specifications.**

The product cannot be used outside its own specifications. In addition, never modify or add to the product.

Furthermore, this product is intended for use in general industrial equipment and components, and is therefore not applicable for outdoor use or for use under the following conditions or in the following environments.

(However, if you consult us before adopting it and understand our product's specifications, it will be applicable, but take safety measures to avoid danger in the unlikely event of a failure.)

- ① Use in equipment and applications that come into direct contact with atomic energy, railways, aviation, ships, vehicles, medical equipment, beverages, food, etc., and applications requiring safety, such as entertainment equipment, emergency shutdown circuits, press machines, brake circuits, and applications for safety measures.
- ② Use in applications where significant impacts on people and property are expected and where safety is particularly important.

- 3. Be sure to observe all applicable organization standards, laws, regulations, etc. regarding safety related to equipment design and management.**

ISO4414, JIS B 8370 (General rules for pneumatic systems)

JFPS2008 (Principles for pneumatic cylinder selection and use)

High Pressure Gas Safety Act, Industrial Safety and Health Act and other safety regulations, organization standards, laws and regulations, etc.

- 4. Never handle this product or remove any pipes or equipment until safety has been confirmed.**

- ① Before inspecting or maintaining machinery or equipment, be sure to confirm that all systems involving this product are safe.
- ② Even when machinery or equipment is not operating, there may be hot or live parts present, so be careful.
- ③ When inspecting or maintaining equipment, shut off the energy sources (air supply, water supply) and the power to the relevant equipment, exhaust any compressed air in the system, and take care to avoid water leakage and electrical leakage.

- ④ When starting or restarting machinery or equipment that uses pneumatic equipment, be sure to check that the safety of the system has been ensured, including measures to prevent the machinery or equipment from jumping out, and proceed with caution.

5. To prevent accidents, be sure to observe the warnings and precautions on the following pages.

■The safety precautions shown here are categorized into three levels: "Danger," "Warning," and "Caution."



Danger

Limited cases where improper handling may result in a dangerous situation resulting in death or serious injury, and the urgency (degree of imminence) of the danger occurring is high.



Warning

Cases where improper handling may result in danger of death or serious injury.



Caution

Cases where improper handling may result in a dangerous situation resulting in minor injury or property damage only.

Furthermore, even the matters described under "Caution" may lead to serious consequences depending on the situation.

All safety precautions contain important information, so be sure to observe them.

Warranty Precautions

- **Warranty period**

The warranty period for our products is one year after delivery the location specified by you.

- **Warranty coverage**

If a failure occurs during the above warranty period that is clearly our responsibility, we will provide a replacement product or necessary replacement parts free of charge, or repair the product at our factory free of charge.

However, the following cases will be excluded from the scope of this warranty.

- ① Cases where the product is being handled or used under conditions or environments other than those described in the catalog or specifications
- ② Cases where the cause of the failure is due to reasons other than this product
- ③ Cases where the product is used in a way other than its intended use
- ④ Cases where the cause is modifications or repairs that we are not involved in
- ⑤ Cases where the cause is unforeseeable with the technology in use at the time of delivery
- ⑥ Cases where the cause is a natural disaster or other disaster that is not our responsibility

Furthermore, the warranty here relates to the delivered product alone and excludes any damage caused by defects in the delivered product.

- **Checking compatibility**

It is the customer's own responsibility to verify the compatibility of our products with the systems, machines, and equipment used by the customer.

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1. How to Unpack

	<h3>Caution</h3>	<p>Do not remove the piping port protection until just before doing the piping.</p> <p>If the piping port protection is removed before connecting the piping, foreign matter may enter the product via the piping port, causing failures, malfunctions, etc.</p>
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- (1) Check that the model number of the product you ordered is the same as the model number on the product nameplate.
- (2) Check that there is no external damage.
- (3) When storing the product, keep it in the individual box to prevent foreign matter from getting inside the valve, and take it out from the box when doing piping.

2. Installation Method

	<h3>Warning</h3>	<p>If you are using the product outside of the specified specifications or for special purposes, consult us regarding specifications.</p>
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2.1 Installation environment

	<h3>Warning</h3>	<ol style="list-style-type: none"> a) Do not get water, cutting fluid, etc. directly on the product. <ul style="list-style-type: none"> · If water or cutting fluid gets directly on the solenoid valve, it may cause coil burn. In addition, if there is a possibility of exposure to spatter during welding, take appropriate protective measures. b) The coil heats up. <ul style="list-style-type: none"> · If the product is installed inside a control panel or if the power is on for long periods of time, consider ventilation and other heat dissipation measures. Failure to do so will cause the coil to be in a high temperature state. c) Do not use the product in corrosive or solvent environments. d) Avoid humid environments, as condensation may occur due to temperature changes. e) Do not use the product in an explosive gas atmosphere. <ul style="list-style-type: none"> · Select an explosion-proof solenoid valve. f) Use the product in an environment where it is not exposed to radiant heat.
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- (1) If using it in cold regions, take appropriate measures to prevent the product from freezing.
- (2) This product cannot be used outdoors. Protect it by installing it in a cover or panel.
- (3) After installation, avoid cleaning with water or solvents or painting. Otherwise, some plastic parts may get damaged.
- (4) Avoid using the solenoid valve in an environment where it is subject to vibration or inertia.

2.2 Installation method

	<h3>Caution</h3>	<p>a) Read the instruction manual carefully and understand its contents before installing the product.</p> <p>b) When handling or installing the product, always hold the body.</p> <p>c) After installation, check for any leaks in the pipes to ensure that the installation has been done correctly.</p>
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(1) The installation orientation is free.

However, avoid installing the coil facing downwards, as this will cause foreign matter in the fluid to adhere to the electromagnetic core, resulting in humming noises or malfunctions.

(2) Ensure there is sufficient space for safely performing maintenance and troubleshooting.

2.3 Piping method

	<h3>Caution</h3>	<p>a) When tightening the pipes or redoing piping, secure the product in place.</p> <p>b) Secure and support the pipes so that their weights and vibrations will not be directly applied to the valve.</p> <p>c) When supplying fluid after completing the pipe connections, supply it without applying sudden pressure at first.</p> <ul style="list-style-type: none"> · Insufficient pipe connections can lead to accidents such as pipes coming off or fluid leaking.
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(1) Cleaning pipe materials

- Before doing piping, perform flushing with air at 0.3 MPa or more to remove foreign matter such as dust, metal powder, rust, and sealing tape.

(2) Removal of foreign matter

- Dust and other foreign matter in the fluid can cause malfunctions and leaks.

On the primary side of the valve, install a filter of 5 µm or less if the fluid is air, or a strainer of 80 mesh or more if the fluid is water.

(3) Piping

- When doing piping, be careful not to make mistakes with the supply ports, etc.

If unsure about the supply port, refer to the model name and JIS symbol in the catalog.

(4) Sealant

- When using sealant, be careful not to let it get inside the pipes and ensure that it does not leak outside. When wrapping sealing tape around threads, leave one or two threads at the tip of the screw. When using liquid sealant, be sure not to apply too much, leaving one or two threads on the tip of the screw. Do not apply it to the female thread side of the equipment. (See Figure 1.)

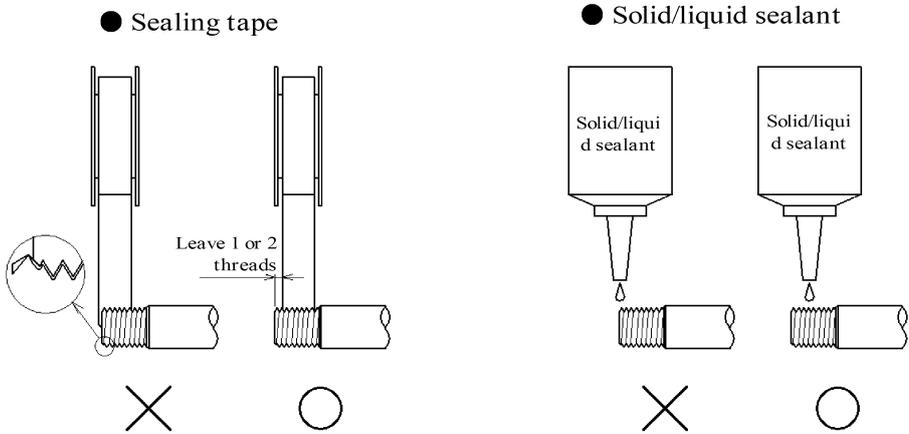


Figure 1. Sealant application

(5) Tightening

- Refer to Table 1 for tightening torque when doing piping.

Table 1. Recommended pipe tightening torque

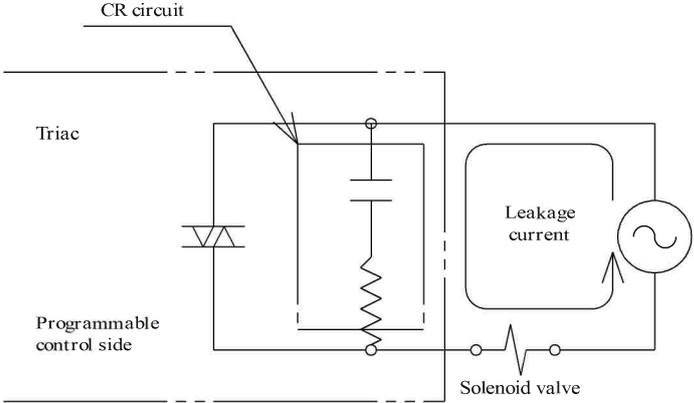
Nominal diameter of pipe	Recommended pipe tightening torque
Rc 1/8	6 to 8 [N·m]
Rc 1/4	11 to 13 [N·m]

(6) Lubrication / No lubrication

- Since the product can be used without lubrication, a lubricator is not necessary, but if you do lubricate it, do so continuously so that the lubricant does not run out. Use a turbine oil type 1 / ISO VG 32 (#90) equivalent lubricant.

2.4 Wiring method

	<h2>Caution</h2>	<p>When carrying out electrical wiring, read the instruction manual carefully and fully understand it before performing disassembly/assembly work.</p> <ul style="list-style-type: none"> It is necessary to understand the structure and operating principles of the solenoid valve and have the knowledge required to ensure safety.
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	<h2>Caution</h2>	<p>a) Check the power supply's voltage and AC/DC.</p> <p>b) Check for leakage current to avoid malfunctions caused by leakage current from other control devices.</p> <ul style="list-style-type: none"> When using control devices such as programmable controllers, leakage current from the control devices may cause the solenoid valve to malfunction. When using this product, make sure that the leakage current from other devices is below the value shown in the table below. <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Rated voltage</th> <th style="text-align: center;">Leakage current</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">100 V AC</td> <td style="text-align: center;">6 mA or less</td> </tr> <tr> <td style="text-align: center;">200 V AC</td> <td style="text-align: center;">3 mA or less</td> </tr> <tr> <td style="text-align: center;">24 V DC</td> <td style="text-align: center;">1 mA or less</td> </tr> </tbody> </table> <div style="text-align: center; margin-top: 20px;">  <p>The diagram illustrates a CR circuit for a solenoid valve. It shows a Triac connected to a Programmable control side. The CR circuit includes a capacitor and a resistor. A Solenoid valve is connected to the output of the CR circuit. A Leakage current measurement point is shown as a circle with a sine wave inside, connected to the solenoid valve circuit.</p> </div>	Rated voltage	Leakage current	100 V AC	6 mA or less	200 V AC	3 mA or less	24 V DC	1 mA or less
Rated voltage	Leakage current									
100 V AC	6 mA or less									
200 V AC	3 mA or less									
24 V DC	1 mA or less									

(1) Electrical equipment maintenance

- To maintain the integrity of electrical equipment, use a fuse or other circuit breaker on the control circuit side.

(2) Hard wiring method

- As a rough guide, use wires for wiring with a nominal cross-sectional area of 0.5 mm² or more. Do not apply excessive force to the lead wires. For coils, there is no polarity even with DC voltage.

3. Checking Before Use (Checking After Installation)

3.1 Checking the appearance



Warning

Stop the fluid flow. (Close the main valve.)
Drain the fluid from the solenoid valve.

- (1) Press the solenoid valve by hand to make sure it is securely fastened to the pipes.
- (2) Make sure that threaded fasteners such as bolts, nuts, and screws are not loose.

3.2 Checking for leaks

- (1) Pressurize the fluid and check the connections for leaks.

To check for leaks, we recommend supplying compressed air (0.3 to 0.5 MPa), applying soapy water, and checking to see if bubbles form.

3.3 Checking the electricity



Warning

Turn off the power.
Be careful of electric shock when checking.

- (1) Check the power supply voltage.
Voltage fluctuations should be within the range of $\pm 10\%$ of the rated voltage.
Using the product outside the allowable voltage range may cause malfunctions or damage to the coil.
- (2) Checking the insulation resistance
Measure the insulation resistance between the non-current-carrying metal parts assembled to the solenoid valve and bare current-carrying parts such as lead wires.
Check that the resistance is 100 M Ω or more using a 500 V DC megger.

3.4 Checking the operation

- (1) Apply the rated voltage and pressurize the fluid in use to check that the solenoid valve opens and closes normally.

4. Proper Use

Precautions for use

 <p>Warning</p>	<ul style="list-style-type: none"> a) It cannot be used as an emergency shutoff valve, etc. <ul style="list-style-type: none"> · It is not designed as an emergency shutoff valve or other safety valve. In such a system, take other measures to ensure safety before using it. b) Take necessary measures in advance to prevent any adverse effects on people or property in the event of a failure of this product. c) Liquid seal <ul style="list-style-type: none"> · When flowing a liquid, if the circuit is liquid-sealed, the pressure may increase due to temperature changes and the product may not operate. Install a relief valve on the system to prevent it from becoming a liquid-sealed circuit. d) Fluids used <ul style="list-style-type: none"> · Do not use any fluid other than those stated in the specifications. · Use the control fluid checklist stated in the catalog to confirm compatibility with the fluid to be used before use. · Note that when the solenoid valve is in operation, the internal parts undergo wear, generating wear debris that may flow to the secondary side of the solenoid valve.
 <p>Caution</p>	<ul style="list-style-type: none"> a) When the power is on or immediately after it has been, do not touch the coil or actuator with your hands or body. Doing so may result in burns. b) When the power is on, do not touch the electrical wiring (bare current-carrying parts) with your hands or body. Doing so may result in electric shock. c) Use the product within the specified pressure range.

- (1) When carrying the solenoid valve, hold it by the product body.
Avoid holding it by dangling it by the lead wire.
- (2) Do not use the solenoid valve as a foothold or place heavy objects on it.
- (3) If the valve has not been used for more than a month, the valve seats may stick together, causing delays in operation. Conduct a test run before starting work.
- (4) If dry air or inert gas is used, wear may significantly shorten the lifespan, so in this case use a valve for dry air.
- (5) Use the product with a fluid whose viscosity is 50 mm²/s or less. Exceeding 50 mm²/s may result in malfunction.
- (6) If an abnormality occurs, refer to "6. Failures and Countermeasures."

5. Maintenance

Maintenance and inspections

	<h2 style="margin: 0;">Caution</h2>	<p>a) When performing maintenance or inspections, read this instruction manual carefully and understand its contents before performing the work.</p> <p>b) Always turn off the power and remove the fluid and pressure before performing maintenance.</p>
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- (1) To ensure optimal use of this product, inspect it regularly.
The frequency of inspections will vary depending on how often it is used, but it should usually be done once every six months.
- (2) For details on inspections, refer to "3. Checking Before Use."
- (3) If you will not be using the product for more than one month after flowing water through it, completely remove any water remaining inside.
If water remains, rust may form, resulting in malfunctions or leaks.
- (4) Be careful that the strainer and filter do not get clogged.
- (5) The screws used to fasten the hood to the body are tapping screws, so do not disassemble them.

6. Failures and Countermeasures

- (1) If the solenoid valve does not operate as intended, inspect it according to Table 4.

Table 4. Failure causes and remedies 3)

Failure condition	Cause	Remedy
The fluid does not flow.	The power is not turned on.	Check the wiring, fuses, etc., and then turn on the power.
	The applied voltage is lower than the allowable voltage range.	Check the power supply and input the rated voltage.
	The fluid pressure is high.	Adjust the fluid pressure to within the range.
	Foreign matter is caught.	Flush it with air.
The fluid does not stop.	The pressure port piping is incorrect.	Install the pipes correctly.
	The power is not off.	Check for leakage current, etc., and correct the circuit so that the power gets turned off properly.
	Foreign matter is caught.	Flush it with air.
Leakage to the outside.	Wear or scratches on the gasket and O-ring.	Product replacement.
Internal leakage.	Wear or scratches on the valve seat of the body.	Product replacement.
	Wear or scratches on the valve seat sealing surface.	Product replacement.
	Foreign matter is caught in the valve seat.	Flush it with air.

- (2) If you have any other questions, contact us or the distributor.

7. Proper Disposal Method

- (1) When disposing of this product, treat it as industrial waste.
- (2) Vinyl chloride resin is used for the insulating coating of the coil lead wire.
Burning vinyl chloride resin produces harmful chlorine gases, so do not burn it when disposing of it.