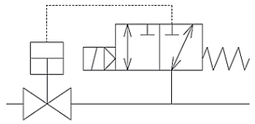
ORIGINAL INSTRUCTIONS

Instruction Manual
High Vacuum Angle Valve
Internal Vacuum Pilot Type
Series XLJ



The intended use of this product is to isolate between a vacuum pump and chamber.

1 Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of “Caution,” “Warning” or “Danger.” They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC) *1), and other safety regulations.

*1) ISO 4414: Pneumatic fluid power - General rules relating to systems.
ISO 4413: Hydraulic fluid power - General rules relating to systems.
IEC 60204-1: Safety of machinery - Electrical equipment of machines. (Part 1: General requirements)
ISO 10218-1: Robots and robotic devices - Safety requirements for industrial robots - Part 1: Robots.

- Refer to product catalogue, Operation Manual and Handling Precautions for SMC Products for additional information.
- Keep this manual in a safe place for future reference.

⚠ **Caution**	Caution indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.
⚠ **Warning**	Warning indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
⚠ **Danger**	Danger indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

⚠ Warning

- **Always ensure compliance with relevant safety laws and standards.**
- All work must be carried out in a safe manner by a qualified person in compliance with applicable national regulations.

2 Specifications

2.1 General Specifications

Model		XLJ-25	XLJ-40
Valve construction		Normally closed	
Fluid		Air, Inert gas	
Fluid and ambient temperature range		5 to 40°C	
Operating pressure range		Atmospheric pressure to 1 x 10^{-2} Pa	
Direction of exhaust		Fixed	
Body material		Aluminum alloy, Brass	
Seal material		FKM	
Vacuum grease		Fluorine grease	
Flange size		KF25	KF40
Conductance (l/s) Note 1)		14	45
Leakage ($Pa \cdot m^3/s$) Note 2)	Internal	1.3 x 10^{-8}	
	External	1.3 x 10^{-6}	
Weight (kg)		0.95	1.5
ON operation (simultaneously with pump)		Valve opens after approx. 2 sec Note 3)	
OFF operation (simultaneously with pump)		Valve closes immediately. Right after that, pump side opens to atmosphere.	

2 Specifications - continued

Note 1) Conductance is the value for the elbow with the same dimensions.
Note 2) Leakage at an ambient temperature of 20°C and when differential pressure is 0.1MPa. Gas permeation is excluded.
Note 3) The value is achieved with suction flow rate of 75 l/min from a pump.

2.2 Coil Specifications

Electrical entry		Grommet
Rated voltage Note 1) (V)	AC	100, 200, 110, 230, 220, 240
	DC	24, 12
Apparent power Note 2,3)	AC	7 VA
Power consumption Note 2)	DC	4.5 W
Allowable voltage fluctuation		±10% of rated voltage
Allowable leakage voltage	AC	5% or less of rated voltage
	DC	2% or less of rated voltage
Coil insulation type		Class B

Note 1) AC type is equipped with full-wave rectifier.
Note 2) The value at an ambient temperature of 20°C and when the rated voltage is applied.
Note 3) There is no difference in the frequency, inrush or energized apparent power, since a rectifying circuit is used for AC.

⚠ Warning

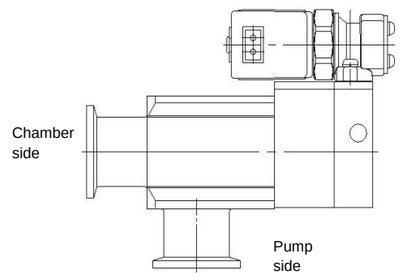
Special products (-X) might have specifications different from those shown in this section. Contact SMC for specific drawings.

3 Installation

3.1 Installation

⚠ Warning

- Do not install the product unless the safety instructions have been read and understood.
- Use clean air. Do not use air that contains chemicals, synthetic oils that include organic solvents, salt, corrosive gases, etc., as it can cause damage or malfunction.
- Install an air filter if necessary close to the valve on the upstream side.
- Use within stated ambient temperature range. Check the compatibility of product’s materials with any fluid contained in the ambient atmosphere. Ensure that any harmful fluid used does come into contact with the external surface of the product.
- Take measures to prevent static electricity since some fluids can cause static electricity.
- Not suitable for use as an emergency shutoff valve. These valves are not designed for safety applications such as an emergency shutoff valve. If the valves are used for the mentioned applications, additional safety measured should be adopted.
- Be aware that the valve surface may get hot if operated continuously. The solenoid coil will generate heat when continuously energized, so avoid installing it in an enclosed space.
- Do not touch the coil while it is being energised or immediately after energization.
- Direction of exhaust



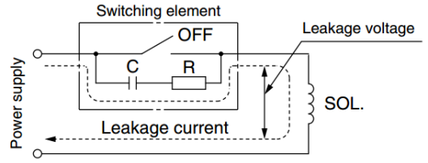
⚠ Caution

3.2 Leakage voltage

Particularly when using a resistor in parallel with a switching element and when using a C-R element (surge voltage suppressor) to protect the switching element, take note that leakage current will flow through the resistor, C-R element, etc., which may prevent the valve from turning off. Ensure that any leakage current, when the switching element is OFF, meets the following limits:

3 Installation - continued

AC coil: 5% or less of the rated voltage
DC coil: 2% or less of the rated voltage



3.3 Valve mounting

⚠ Warning

- If leakage increases or equipment does not operate properly, stop operation.
- After mounting is complete, confirm that it was done correctly by performing a suitable function test.
- Do not warm the coil assembly with a heat insulator, etc. Use tape, heaters, etc., for freeze prevention on the piping and the body only. Warming the coil can cause it to burn out.
- Avoid sources of vibration or adjust the arm from the body to the minimum length so that resonance will not occur.
- Warnings or specifications printed or labelled on the product should not be erased, removed, or covered up.

3.4 Environment

⚠ Warning

- Do not use in an environment where corrosive gases, chemicals, salt water or steam are present.
- Do not use in an explosive atmosphere.
- Do not expose to direct sunlight. Use a suitable protective cover.
- Do not install in a location subject to vibration or impact in excess of the product’s specifications.
- Do not mount in a location exposed to radiant heat that would result in temperatures in excess of the product’s specifications.
- Employ suitable protective measures in locations where there is contact with water droplets, oil or welding splatter, etc.
- In high humidity environments, keep valves packed until the time of installation.

3.5 Piping

⚠ Caution

- Before connecting piping make sure to clean up chips, cutting oil, dust etc.
- When installing piping or fittings, ensure sealant material does not enter inside the port. When using seal tape, leave 1 thread exposed on the end of the pipe/fitting.
- Tighten fittings to the specified tightening torque.
- Perform piping so that excessive force is not applied to the flange sections. In case there is vibration of heavy objects or attachments, secure them so that torque is not applied directly to the flanges.

3.6 Wiring

⚠ Caution

- When DC power is connected to a solenoid valve equipped with light and/or surge voltage suppressor, check for polarity indications.
- Avoid incorrect wiring, as this can cause malfunction and damage the product.
- To prevent noise and surge in signal lines, keep all wiring separate from power lines and high voltage lines. Otherwise, this can cause malfunction.
- When a surge from the solenoid affects the electrical circuitry, install a surge absorber, etc., in parallel with the solenoid. Or use an option that comes with surge voltage protection circuit. However, a surge voltage occurs even if the surge voltage protection circuit is used. For details, please consult with SMC.
- Use electrical circuits that do not generate chattering in their contacts.
- Use voltages that are within ±10% of the rated voltage. In cases with a DC power supply where responsiveness is important, stay within ±5%

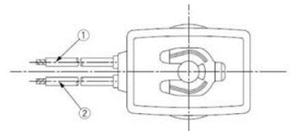
3 Installation - continued

of the rated value (there will be a voltage drop in the lead wires connecting to the coil).

- As a rule, use electrical wire with cross sectional area 0.5 to 1.25 mm^2 for wiring.
- Do not bend or pull cables repeatedly.
- Connect the wires so that an external force greater than 10 N is not applied to the lead wire, otherwise the coil will burn.

3.7 Electrical connections

- Grommet
  Class B coil : AWG20 Outside insulator diameter of 2.5 mm

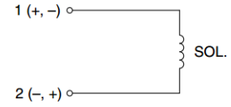


Rated Voltage	Lead wire color	
	1	2
DC	Black	Red
100 VAC	Blue	Blue
200 VAC	Red	Red
Other AC	Grey	Grey

Note) there is no polarity

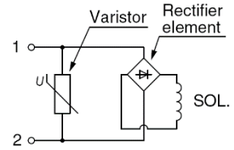
3.8 Electrical circuits

- DC circuit



- AC circuit

For AC, the standard product is equipped with surge voltage suppressor



4 How to Order

Refer to catalogue for ‘How to Order’.

5 Outline Dimensions

Refer to catalogue for outline dimensions.

6 Maintenance

6.1 General maintenance

⚠ Caution

- Not following proper maintenance procedures could cause the product to malfunction and lead to equipment damage.
- If handled improperly, compressed air can be dangerous.
- Maintenance of pneumatic systems should be performed only by qualified personnel.
- Before performing maintenance, turn off the power supply and be sure to cut off the supply pressure. Confirm that the air is released to atmosphere.
- After installation and maintenance, apply operating pressure and power to the equipment and perform appropriate functional and leakage tests to make sure the equipment is installed correctly.
- If any electrical connections are disturbed during maintenance, ensure they are reconnected correctly, and safety checks are carried out as required to ensure continued compliance with applicable national regulations.
- Do not make any modification to the product.
- Do not disassemble the product, unless required by installation or maintenance instructions.

6 Maintenance - continued

Warning

- Removing the product
  Confirm that the valve temperature has dropped sufficiently before performing work. If touched inadvertently, there is a danger of being burned.
- Low frequency operation
  Valves should be operated at least once every 30 days to prevent malfunction (use caution regarding the air supply). Also, in order to use them under the optimum state, conduct a regular inspection biannually.

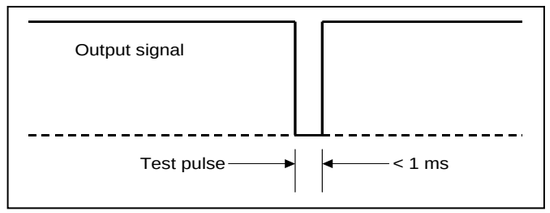
7 Limitations of Use

7.1 Limited warranty and disclaimer/compliance requirements

Refer to Handling Precautions for SMC Products.

Caution

If a safe output from a safety relay or PLC is used to operate this valve, ensure that any output test pulse duration is shorter than 1 ms to avoid the valve solenoid responding.



8 Product Disposal

This product shall not be disposed of as municipal waste. Check your local regulations and guidelines to dispose this product correctly, in order to reduce the impact on human health and the environment.

9 Contacts

Refer to www.smcworld.com or www.smc.eu for your local distributor/importer.

SMC Corporation

URL : https:// www.smcworld.com (Global) https:// www.smc.eu (Europe)
SMC Corporation, 4-14-1, Sotokanda, Chiyoda-ku, Tokyo 101-0021, Japan

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