

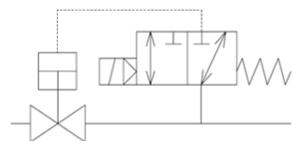


ORIGINAL INSTRUCTIONS



Refer to Declaration of Conformity for relevant Directives

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



The intended use of this product is to isolate a vacuum pump and chamber from automatic vent vacuum pump side when the pump stops.

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/IEC¹⁾, 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: Manipulating industrial robots -Safety, etc.

This manual contains essential information for the protection of users and others from possible injury and/or equipment damage.

- Read this manual before using the product, to ensure correct handling, and read the manuals of related apparatus before use.
- Keep this manual in a safe place for future reference.

- To ensure safety of personnel and equipment the safety instructions in this manual must be observed, along with other relevant safety practices.

	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

- **The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.**
- Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results. The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product. This person should also continuously review all specifications of the product referring to its latest catalogue information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.
- **Only personnel with appropriate training should operate machinery and equipment.**
The product specified here may become unsafe if handled incorrectly.
The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.
- **Do not service or attempt to remove product and machinery/equipment until safety is confirmed.**
1) The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.
2) When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from

1 Safety Instructions - continued

- any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.
- 3) Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.
- **Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.**
 - 1) Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
 - 2) Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustions and recreation, or equipment in contact with food and beverages, emergency stop circuits, clutch and brake circuits in press applications, safety equipment or other applications unsuitable for the standard specification described in the product catalogue.
 - 3) An application which could have negative effects on people, property, animals or requiring special safety analysis.
 - 4) Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation.
 - **Always ensure compliance with relevant safety laws and standards.**
All electrical work must be carried out in a safe manner by a qualified person in compliance with applicable national regulations.

Caution

- **The product is provided for use in manufacturing industries.**
The product herein described is basically provided for peaceful use in manufacturing industries.
If considering using the product in other industries, consult SMC beforehand and exchange specifications or a contract if necessary.
If anything is unclear, contact your nearest sales branch.

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·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.	

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.

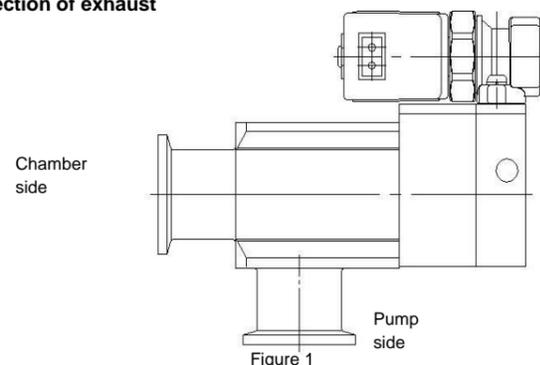
3 Installation

3.1 Selection

3.1.1 Fluid quality

- Air
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.
Install an air filter close to the valve on the upstream side.
- Vacuum
Avoid the entry of foreign matter.
Vacuum piping direction is fixed (Figure1)

Direction of exhaust



3.1.2 Ambient environment

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.

3.1.3 Countermeasures against static electricity

Take measures to prevent static electricity since some fluids can cause static electricity.

Caution

3.1.4 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:

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

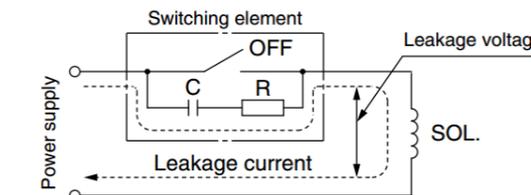


Figure 2

Warning

Do not install the product unless the safety instructions have been read and understood.

3.2 Valve Mounting

Warning

- **If leakage increases or equipment does not operate properly, stop operation.**

3 Installation - continued

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.**
- **Painting and coating**
Warnings or specifications printed or labelled on the product should not be erased, removed, or covered up.

3.3 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. Check the product specifications.
- Do not mount in a location exposed to radiant heat.
- 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.

3.4 Piping

Caution

- Before piping make sure to clean up chips, cutting oil, dust etc.
- Prepare piping by cleaning the sealing surface with ethanol etc.
- 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.

3.5 Precautions on Design

Caution

- **Not suitable for use as an emergency shut-off valve, etc.**
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 measures should be adopted.
- **Extended periods of continuous energization.**

Caution hot surface

* Be aware that the valve surface may get hot.
The solenoid coil will generate heat when continuously energized, so avoid installing in an enclosed space. Install in a well-ventilated area. Do not touch the coil while it is being energized or immediately after energization.

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.

3 Installation - continued

- 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% 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 mm² 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.

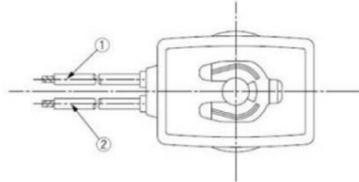


Figure 3

Rated Voltage	Lead wire colour	
	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

3.8.1 DC circuit

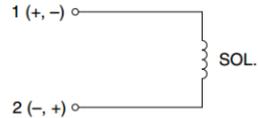


Figure 4

3.8.2 AC circuit

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

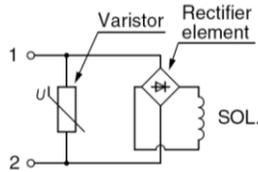


Figure 5

4 How to Order

XLJ - 25 - 5 G 1

Valve size ●

25	KF25
40	KF40

Voltage ●

1	100 VAC
2	200 VAC
3	110 VAC
4	220 VAC
5	24 VDC
6	12 VDC
7	240 VAC
J	230 VAC

Electrical entry ●

G	Grommet
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5 Outline Dimensions (mm)

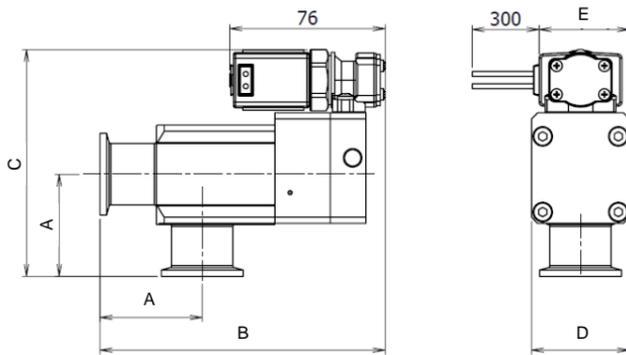


Figure 6

Dimensions [mm]

Model	A	B	C	D	E
XLJ-25	50	139	111	48	44 (54)
XLJ-40	65	168	128	66	53 (63)

Dimension in (brackets) is for AC type.

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.

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

- **The product used is subject to the following "Limited warranty and Disclaimer" and "Compliance Requirements". Read and accept them before using the product.**
- **Limited warranty and Disclaimer**
1) The warranty period of the product is 1 year in service or 1.5 years after the product is delivered, whichever is first ⁽¹⁾. Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.
2) For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided.
This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.

7 Limitations of Use

3) Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalogue for the particular products.

⁽¹⁾ Vacuum pads are excluded from this 1 year warranty.

A vacuum pad is a consumable part, so it is warranted for a year after it is delivered. Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

- **Compliance Requirements**

- 1) The use of SMC products with production equipment for the manufacture of weapons of mass destruction (WMD) or any other weapon is strictly prohibited.
- 2) The exports of SMC products or technology from one country to another are governed by the relevant security laws and regulations of the countries involved in the transaction. Prior to the shipment of a SMC product to another country, assure that all local rules governing that export are known and followed.

Caution

- **SMC products are not intended for use as instruments for legal metrology.**

Measurement instruments that SMC manufactures or sells have not been qualified by type approval tests relevant to the metrology (measurement) laws of each country. Therefore, SMC products cannot be used for business or certification ordained by the metrology (measurement) laws of each country.

Warning

Do not exceed any of the specifications laid out in section 2 of this document or the specific product catalogue.

Warning

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.

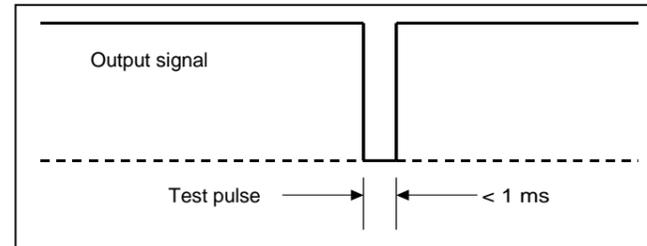


Figure 7

8 Contacts

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BELGIUM	SMC Pneumatics N.V./S.A. Nijverheidsstraat 20, B-2160 Wommelgem
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CROATIA	SMC IndustrijskaAutomatikad.o.o. ZagrebačkaAvenija 104,10 000 Zagreb
CZECH REP.	SMC Industrial Automation CZ s.r.o. Hudcova 78a, CZ-61200 Brno
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ESTONIA	SMC Pneumatics Estonia OÜ, Laki 12, EE-10621 Tallinn
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GERMANY	SMC Deutschland GmbH, Boschring 13-15, 63329 Egelsbach
GREECE	SMC Italia Hellas Branch, Anagenniseos 7-9-P.C. 14342 N.Philadelphia, Athens
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