



Installation and Maintenance Manual
High Vacuum Angle Valve
XLS series



1 Safety Instructions

- 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.
- These instructions indicate the level of potential hazard by label of "DANGER", "WARNING" or "CAUTION", followed by important safety information which must be carefully followed.
- To ensure safety ISO4414: Pneumatic Fluid power and JIS B 8370: Pneumatic System principles must be observed, along with other relevant safety practices.

⚠ DANGER	In extreme conditions, there is a possibility of serious injury or loss of life.
⚠ WARNING	If instructions are not followed there is a possibility of serious injury or loss of life.
⚠ CAUTION	If instructions are not followed there is a possibility of injury or equipment damage.

⚠ WARNING

- **The compatibility of pneumatic equipment is the responsibility of the person who designs the pneumatic system or decides its specifications.**

Since the products specified here can be used in various operating conditions, their compatibility with the specific pneumatic system must be based on specifications or after analysis and/or tests to meet specific requirements.

- **Only trained personnel should operate pneumatically operated machinery and equipment.**

Compressed air can be dangerous if an operator is unfamiliar with it. Assembly, handling or repair of pneumatic systems should be performed by trained and experienced personnel.

- **Do not service machinery/equipment or attempt to remove components until safety is confirmed.**

- 1) Inspection and maintenance of machinery/equipment should only be performed after confirmation of safe locked-out control positions.
- 2) When equipment is to be removed, confirm the safety process as mentioned above. Switch off air and electrical supplies and exhaust all residual compressed air in the system.
- 3) Before machinery/equipment is re-started, ensure all safety measures to prevent sudden movement of cylinders etc. (Supply air into the system gradually to create back pressure, i.e. incorporate a soft-start valve).

- **Do not use this product outside of the specifications. Contact SMC if it is to be used in any of the following conditions:**

- 1) Conditions and environments beyond the given specifications, or if the product is to be used outdoors.
- 2) Installations in conjunction with atomic energy, railway, air navigation, vehicles, medical equipment, food and beverage, recreation equipment, emergency stop circuits, press applications, or safety equipment.
- 3) An application which has the possibility of having negative effects on people, property, or animals, requiring special safety analysis.

⚠ CAUTION

- Ensure that the air supply system is filtered to 5 microns.

2 Specifications

2.1 XLS General Specifications

Model	XLS-16	XLS-25
Valve type	Normally closed (N.C.)	
Fluid	Non-corrosive gas for aluminium alloy (A6063) and stainless steel (SUS405 equiv.)	
Operating temperature (°C)	5 to 40	
Operating Pressure Pa (abs)	0.2 MPa to 1x10 ⁻⁶	
Conductance (l/s)	5	8
Leakage (Pa m ³ /s)	Internal	1.3x10 ⁻⁸ at ordinary temperatures - excluding gas permeation.
	External	1.3x10 ⁻¹⁰ at ordinary temperatures - excluding gas permeation.
Principle materials	Body: Aluminium alloy, Bellows: SUS316L, Main part: SUS304, SUS405 equivalent, FKM (Fluorine rubber), resin (PFA), etc (Note 1)	
Max. operating fluctuation	10cycles/min.	
Service life (Million cycles)	0.5	
Mass (Kg)	0.4	0.7

Note 1) The vacuum version uses vacuum grease (fluorine type: Y-VAC3)

2.2 Solenoid specifications

Electrical entry	Grommet (G)
	Conduit (C)
	Din terminal (D)
	Terminal (T)
Coil rated voltage (Started/holding)	24/6, 48/12, 100/24 VDC
Allowable voltage fluctuation	±10% rated voltage
Power consumption (starting/holding) W	XLS-16 36/4.8
	XLS-25 47/5.3
Lubrication	Not required
Coil Insulation	Class B

3 Installation

3.1 Installation

⚠ WARNING

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

3.2 Environment

⚠ WARNING

- Do not use in an environment where the product is directly exposed to corrosive gases, chemicals, salt water, water or steam.
- Do not use in an explosive atmosphere.
- The product should not be exposed to prolonged sunlight. Use a protective cover.
- Do not mount the product in a location where it is subject to strong vibrations and/or shock. Check the product specifications.
- Do not mount the product in a location exposed to radiant heat.
- If using in atmosphere where there is possible contact with water drop-lets, oil, weld spatter, etc., take suitable preventative measures.
- When the solenoid valve is mounted in a control panel or its energised for a long time, make sure ambient temperature is within the valve specification range.

3 Installation (continued)

3.3 Vacuum Piping

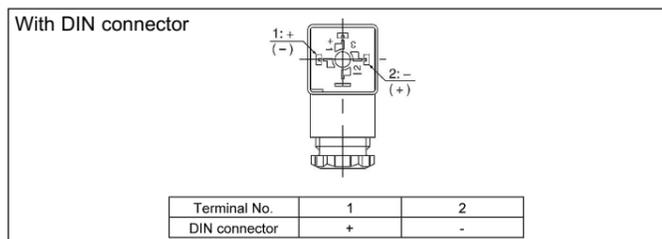
⚠ WARNING

- Before piping make sure to clean up chips, cutting oil, dust etc. Clean the surface of the flange seal and the O-ring with ethanol, etc.
- Be sure that the flange O-ring is compressed by 15% or more.
- In high humidity environments, keep in packaged condition until just before piping.
- Seal part on flange is protected, but for safety reasons, do not handle.

3.4 Electrical connection

⚠ CAUTION

- The connections for the DIN connector & terminal block are shown below:

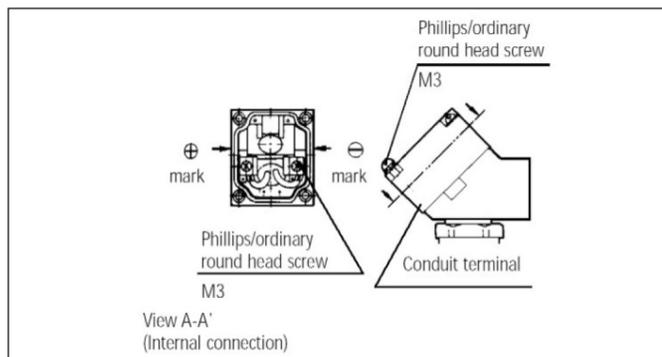


1. Loosen the top screw and remove the connector housing from the terminal spades on the solenoid.
2. Remove the housing screw and insert a screwdriver into the slot on the underside of the DIN cap and carefully remove the block.
3. Loosen the terminal screws on the block and insert the stripped leads. Secure each lead by re-tightening the appropriate terminal screw.
4. Tighten the housing grommet nut to secure the cable.

⚠ CAUTION

Pull connector out vertically, never at an angle.

- The connections for the Conduit entry are shown below:



3.5 Wiring

⚠ CAUTION

- As a rule, use electrical wire with a cross sectional area of 0.5 to 1.25mm² for wiring. Furthermore, do not allow excessive force to be applied to the lines.
- Use electrical circuits which do not generate chattering in their contact.
- Use voltage which is within ±10% of the rated voltage. In cases with a DC power supply where importance is placed on responsiveness, stay within ±5% of the rated value. The voltage drop is the value in the lead wire section connecting the coil.
- When a surge from the solenoid affects the electrical circuitry, install a surge absorber, etc., in parallel with the solenoid.
- When starting voltage is applied, large current runs. Therefore, select a circuit component after checking the current on the specifications.
- Be sure to place a fuse or an earth leakage breaker for a power supplying circuit.

4 Maintenance

4.1 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 by qualified personnel only.
- Before performing maintenance ensure the supply pressure is shut off and all residual air pressure is released from the system.
- After maintenance apply operating pressure and power to the equipment and check for proper operation and possible air leaks. If operation is abnormal, verify product set-up parameters.
- Do not make any modification to the product.
- Do not disassemble the product, unless required by installation or maintenance instructions.
- Low frequency operation: Valves should be switched at least once every 30 days to avoid malfunction. (Pay attention to air supply).

4.2 Maintenance parts

Service part number

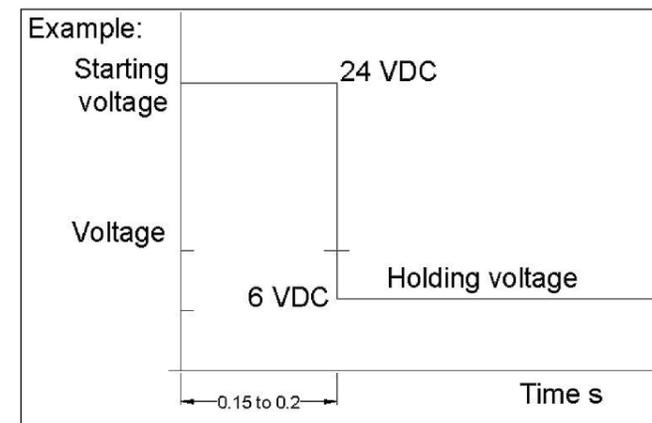
	Size 16	25
Coil assembly	XLS16-20-*G,C,D,T	XLS25-20-*G,C,D,T
Core assembly	XLS16-30-1	XLS25-30-1
Armature assembly	XLS16-30-2	XLS25-30-2
Core O-ring	AS568-018V	AS568-018V
Bonnet O-ring	AS568-025V	AS568-030V

5 Limitations of Use

5.1 Voltage

⚠ WARNING

- The starting voltage should be applied for only 0.15 to 0.20s, in accordance with described method (indicated on the back of the coil.) Continuously applying the starting voltage will damage the coil, cause it to overheat and could possibly cause a fire. The holding voltage is 25% of the starting voltage (the application method is shown on the back of the solenoid coil.)

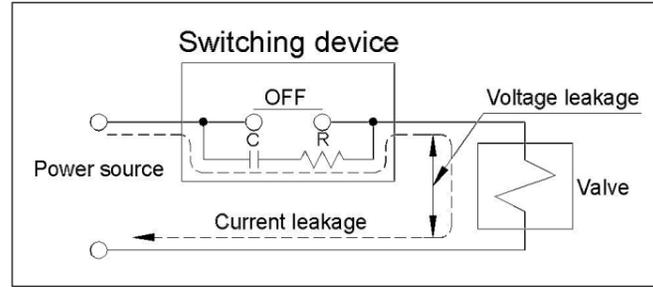


⚠ CAUTION

- Voltage leakage: When the C-R device (surge voltage suppressor) is used to protect the switching device, be aware that that voltage leakage will increase through the C-R device. Suppressor residual voltage leakage should be as follows:

5 Limitations of Use (continued)

DC coil: 2% or less of rated voltage



5.2 Materials

⚠ WARNING

- Standard valve materials:
Body: A6063,
Bellows: SUS316L,
Vacuum sealant: Fluorine rubber.
- Other materials used for vacuum environments are; SUS304, SUS405 (equivalent), A2017 and PFA.

5.3 Operating pressure and fluid

⚠ CAUTION

- Use within operating pressure range.
- Check the product periodically for fluid deposits. Remove the fluid or replace the part if necessary.

6 Contacts

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BELGIUM	(32) 3-355 1464	NETHERLANDS	(31) 20-531 8888
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DENMARK	(45) 70 25 29 00	POLAND	(48) 22-548 50 85
FINLAND	(358) 207-513 513	PORTUGAL	(351) 2 610 89 22
FRANCE	(33) 1-64 76 1000	SPAIN	(34) 945-18 4100
GERMANY	(49) 6103 4020	SWEDEN	(46) 8-603 0700
GREECE	30) 1- 342 6076	SWITZERLAND	(41) 52-396 3131
HUNGARY	(36) 1-371 1343	TURKEY	(90) 212 221 1512
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