

Aluminium High Vacuum Angle Valve RoHS

■ Improved durability of bellows (Flange sizes 100 and 160)

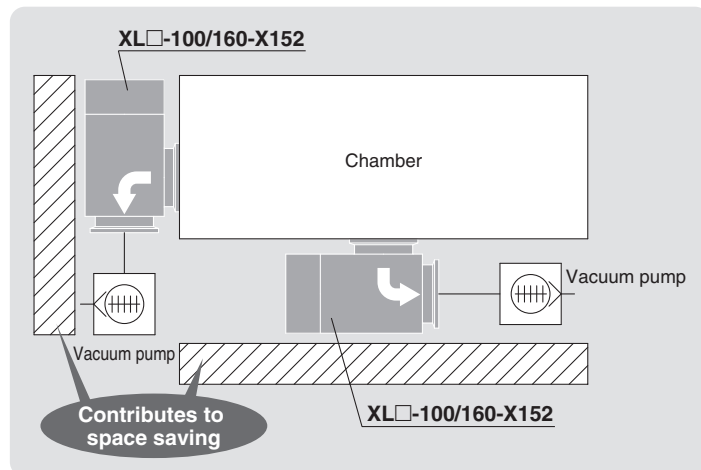
■ Service life of two million cycles^{*1}

^{*1} The service life is based on SMC's testing. Refer to the operation manual for details.

■ Space required for equipment can be reduced

Without restriction on exhaust direction (two ways: from valve element side to bellows side and vice versa)

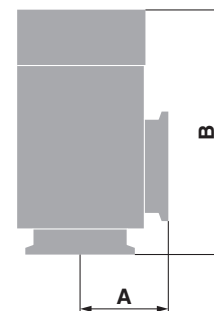
Increased flexibility of mounting orientation



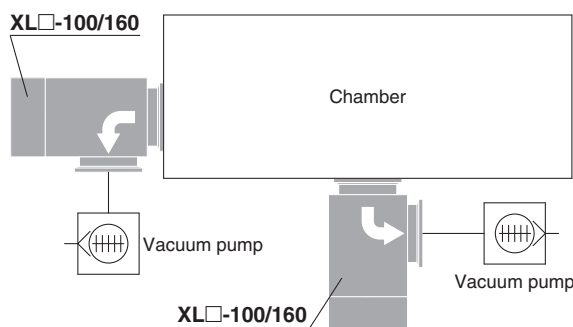
XLA-□-X152

■ Lightweight, Compact

Large conductance, small body, excellent resistance against fluorine corrosion (body)



With restriction on exhaust direction (one way only: from valve element side to bellows side)



Model	A [mm]	B [mm]	Weight [kg]	Conductance [L/s]
XLA-100-X152	108	300	10.6	300
XLA-160-X152	138	315	18.5	800

Variations

Model	Valve type	Operating pressure [Pa(abs)]	Leakage [Pa·m³/s]		Flange size		Option			
			Internal ^{*1}	External ^{*1}	100	160	Switch	Heater	Indicator	High-temperature type
XLA-100/160-X152	Single acting (N.C.)	10 ⁻⁶ to atmospheric pressure	10 ⁻¹⁰	10 ⁻¹¹	●	●	●	●	●	●
XLC-100/160-1-X152	Double acting				●	●	●	●		●

^{*1} When the standard seal material (FKM) is used

XLA/C-100/160(-1)-X152



18-EU692-UK

Aluminium High Vacuum Angle Valve Normally Closed, Bellows Seal

RoHS

XLA-100/160-X152

How to Order

XLA - 100 - M9N A - - X152

①②③④⑤⑥⑦

• Improved durability of bellows

① Flange size

Size
100
160

② Flange type

Symbol	Type
—	KF (NW)
D	K (DN)

④ Temperature specifications/Heater

Symbol	Temperature	Heater
—	5 to 60°C	—
High-temperature type	H0	—
	H4	With 100 °C heater
	H5	With 120 °C heater

* Heater cannot be retrofitted for the H0 type.

⑥ Number of auto switches/Mounting position

Symbol	Quantity	Mounting position
—	Without auto switch	—
A	2	Valve open/closed
B	1	Valve open
C	1	Valve closed

⑦ Body surface treatment/Seal material and changed parts

• Body surface treatment

Symbol	Surface treatment
—	External: Hard anodised Internal: Raw material
A	External: Hard anodised Internal: Oxalic acid anodised

• Seal material

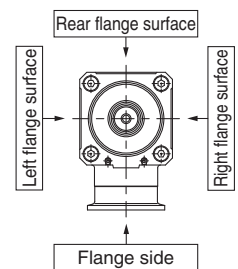
Symbol	Seal material	Compound no.
—	FKM	1349-80*1
N1	EPDM	2101-80*1
P1	Barrel Perfluoro®	70W
Q1	Kalrez®	4079
R1	Chemraz®	SS592
S1	VMQ	1232-70*1
T1	FKM for Plasma	3310-75*1
U1	ULTIC ARMOR®	UA4640
F1	FKM	—*2

*1 Produced by MITSUBISHI CABLE INDUSTRIES, LTD.

*2 Same specifications as the standard FKM type

③ Indicator/Pilot port direction

Symbol	Indicator	Pilot port direction
—	Without indicator	Flange side
A	With indicator	Flange side
F		Left flange surface
G		Rear flange surface
J		Right flange surface
K	Without indicator	Left flange surface
L		Rear flange surface
M		Right flange surface



⑤ Auto switch type

Symbol	Model	Remarks
—	—	Without auto switch (without magnet)
M9N(M)(L)(Z)	D-M9N(M)(L)(Z)	Solid state auto switch
M9P(M)(L)(Z)	D-M9P(M)(L)(Z)	
M9B(M)(L)(Z)	D-M9B(M)(L)(Z)	
A90(L)	D-A90(L)	Reed auto switch
A93(M)(L)(Z)	D-A93(M)(L)(Z)	
M9//	—	Without auto switch (with magnet)

* Auto switches shown above cannot be mounted on the high-temperature type. For the high-temperature type, a semi-standard product that uses the heat resistant auto switch D-F7NJ is available. For details, please contact SMC.

* Standard lead wire length is 0.5 m. Add L to the end of the part number for 3 m, M for 1 m, and Z for 5 m.

Example) -M9NL

* A type with a pre-wired connector is also selectable. Example) -M9NSAPC

* Refer to the catalogue on www.smc.eu for further information on auto switches.

• Part with changed seal material and leakage

Symbol	Changed part*2	Leakage [Pa·m³/s or less]*1	
		Internal	External
—	None	1.3 x 10 ⁻¹⁰ (FKM)	1.3 x 10 ⁻¹¹ (FKM)
A	②, ③	1.3 x 10 ⁻⁸	1.3 x 10 ⁻⁹
B	②	1.3 x 10 ⁻⁸	1.3 x 10 ⁻¹¹ (FKM)
C	③	1.3 x 10 ⁻¹⁰ (FKM)	1.3 x 10 ⁻⁹

*1 Values at normal temperature, excluding gas permeation

*2 Refer to Construction on page 2 for changed part. Number corresponds with the parts number on the construction drawing.

*3 For option "F1," only "A" can be selected. The leakage amount is the same as that of "—" (standard FKM type).

To order something other than — (standard), followed by each symbol for body surface treatment, seal material, and then changed part.

Example) XLA-100-M9NA-AN1A-X152

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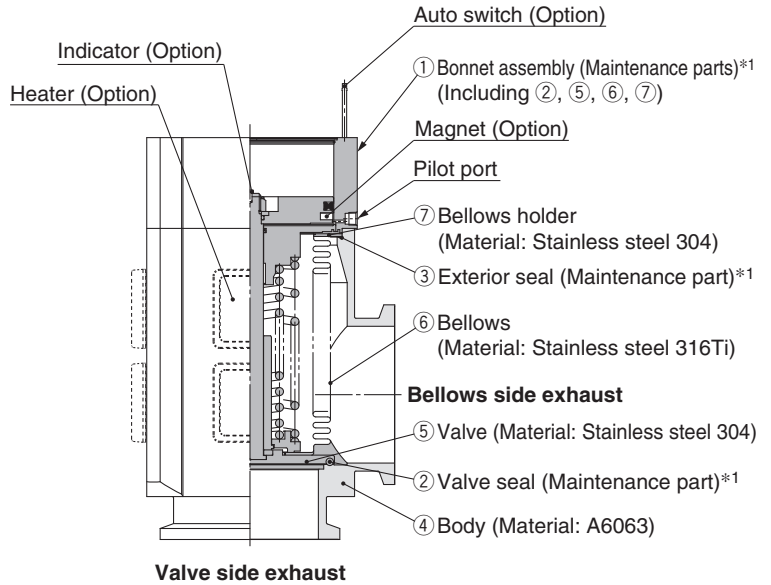
Aluminium High Vacuum Angle Valve Normally Closed, Bellows Seal **XLA-100/160-X152**

Specifications

Model		XLA-100-X152	XLA-160-X152
Valve type		Normally closed (Pressurise to open, Spring seal)	
Fluid		Inert gas under vacuum	
Operating temperature [°C]		5 to 60 (High-temperature type: 5 to 150)	
Operating pressure [Pa(abs)]		1 x 10 ⁻⁶ to atmospheric pressure	
Conductance [L/s]*1		300	800
Leakage [Pa·m ³ /s]	Internal	For standard seal material (FKM): 1.3 x 10 ⁻¹⁰ at normal temperature, excluding gas permeation	
	External	For standard seal material (FKM): 1.3 x 10 ⁻¹¹ at normal temperature, excluding gas permeation	
Flange type		KF (NW), K (DN)	
Principal materials		Body: Aluminium alloy Bellows: Stainless steel Chief part: Stainless steel, FKM (standard seal material)	
Surface treatment		External: Hard anodised Internal: Raw material	
Pilot pressure [MPa(G)]		0.4 to 0.7	
Pilot port size		Rc1/8	Rc1/4
Weight [kg]		10.6	18.5

*1 Conductance is the value for the elbow with the same dimensions.
* For valve heater specifications, refer to Common Option [1] Heater on page 5.

Construction/Operation



*1 Refer to Maintenance Parts on page 6.

<Working principle>

By applying pilot pressure from the pilot port, the piston-coupled valve overcomes the force of the spring or operating force by pressure, and the valve opens.

<Option>

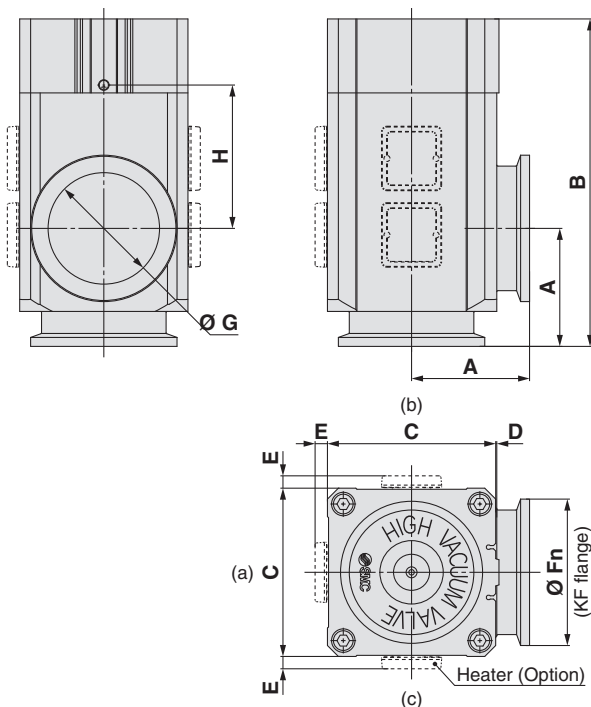
Auto switch: The magnet activates the auto switch. With 2 auto switches, the open and closed positions are detected, and with 1 auto switch, either the open or closed position is detected. The temperature range is only available for general use (5 to 60 °C).

Heater : Heating is performed simply using thermistors. The valve body can be heated to approximately 100 or 120 °C, depending on the size of the valve. The type and number of thermistors to be used will vary depending on the size and setting temperature. For the high-temperature type, the bonnet assembly is a heat-resistant structure. This does not apply in cases where a solenoid valve is attached.

Indicator : When the valve is open, an orange marker appears in the centre of the name plate.

Dimensions

XLA-100/160-X152: Air operated



[mm]									
Model	A	B	C	D	E*1	F _n	F _d	G	H
XLA-100-X152	108	300	154	3	11	134	130	102	131
XLA-160-X152	138	315	200	3	11	190	180	153	112

*1 The E dimension applies when the heater option is included. (Lead wire length: Approx. 1 m)

* (a), (b), (c) in the above drawing indicate heater mounting positions. Moreover, heater mounting positions will differ depending on the type of heater. For details, refer to Common Option [2] Mounting position of the heater on page 5.

Aluminium High Vacuum Angle Valve Double Acting, Bellows Seal

RoHS

XLC-100/160-1-X152

How to Order

XLC - 100 - **1** M9N A - - **X152**

①②③④⑤⑥⑦

• Improved durability of bellows

① Flange size

Size
100
160

② Flange type

Symbol	Type
—	KF (NW)
D	K (DN)

④ Temperature specifications/Heater

Symbol	Temperature	Heater
—	5 to 60°C	—
High-temperature type	H0 H4 H5	5 to 150°C
		With 100 °C heater
		With 120 °C heater

* Heater cannot be retrofitted for the H0 type.

⑥ Number of auto switches/Mounting position

Symbol	Quantity	Mounting position
—	Without auto switch	—
A	2	Valve open/closed
B	1	Valve open
C	1	Valve closed

⑦ Body surface treatment/Seal material and changed parts

• Body surface treatment

Symbol	Surface treatment
—	External: Hard anodised Internal: Raw material
A	External: Hard anodised Internal: Oxalic acid anodised

• Seal material

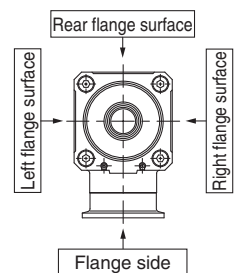
Symbol	Seal material	Compound no.
—	FKM	1349-80*1
N1	EPDM	2101-80*1
P1	Barrel Perfluoro®	70W
Q1	Kalrez®	4079
R1	Chemraz®	SS592
S1	VMQ	1232-70*1
T1	FKM for Plasma	3310-75*1
U1	ULTIC ARMOR®	UA4640
F1	FKM	—*2

*1 Produced by MITSUBISHI CABLE INDUSTRIES, LTD.

*2 Same specifications as the standard FKM type

③ Pilot port direction

Symbol	Pilot port direction
—	Flange side
K	Left flange surface
L	Rear flange surface
M	Right flange surface



⑤ Auto switch type

Symbol	Model	Remarks
—	—	Without auto switch (without magnet)
M9N(M)(L)(Z)	D-M9N(M)(L)(Z)	Solid state auto switch
M9P(M)(L)(Z)	D-M9P(M)(L)(Z)	
M9B(M)(L)(Z)	D-M9B(M)(L)(Z)	
A90(L)	D-A90(L)	Reed auto switch
A93(M)(L)(Z)	D-A93(M)(L)(Z)	
M9//	—	Without auto switch (with magnet)

* Auto switches shown above cannot be mounted on the high-temperature type. For the high-temperature type, a semi-standard product that uses the heat resistant auto switch D-F7NJ is available. For details, please contact SMC.

* Standard lead wire length is 0.5 m. Add L to the end of the part number for 3 m, M for 1 m, and Z for 5 m.

Example) -M9NL

* A type with a pre-wired connector is also selectable. Example) -M9NSAPC

* Refer to the catalogue on www.smc.eu for further information on auto switches.

• Part with changed seal material and leakage

Symbol	Changed part*2	Leakage [Pa·m³/s or less]*1	
		Internal	External
—	None	1.3 x 10 ⁻¹⁰ (FKM)	1.3 x 10 ⁻¹¹ (FKM)
A	②, ③	1.3 x 10 ⁻⁸	1.3 x 10 ⁻⁹
B	②	1.3 x 10 ⁻⁸	1.3 x 10 ⁻¹¹ (FKM)
C	③	1.3 x 10 ⁻¹⁰ (FKM)	1.3 x 10 ⁻⁹

*1 Values at normal temperature, excluding gas permeation

*2 Refer to Construction on page 4 for changed part. Number corresponds with the parts number on the construction drawing.

*3 For option "F1," only "A" can be selected. The leakage amount is the same as that of "—" (standard FKM type).

To order something other than — (standard), followed by each symbol for body surface treatment, seal material, and then changed part.

Example) XLC-100-1M9NA-AN1A-X152

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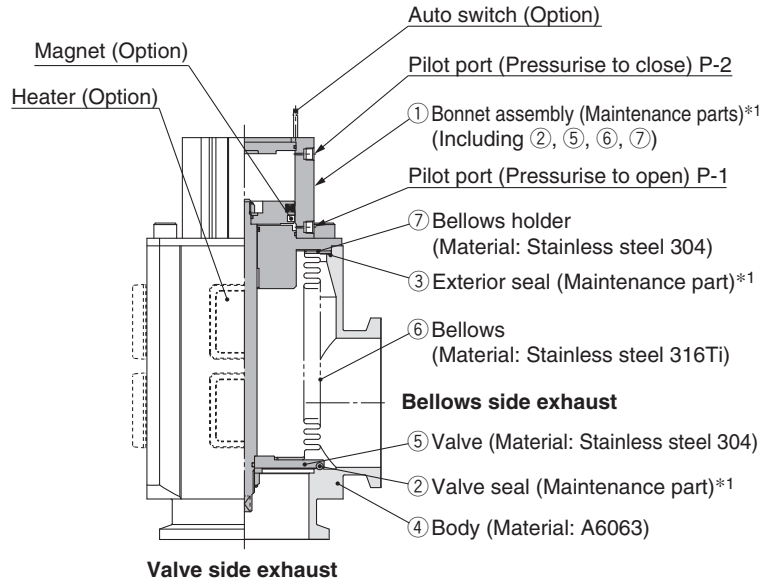
Aluminium High Vacuum Angle Valve Double Acting, Bellows Seal **XLC-100/160-1-X152**

Specifications

Model		XLC-100-1-X152	XLC-160-1-X152
Valve type		Double acting (Dual operation), Pressurise to open/close	
Fluid		Inert gas under vacuum	
Operating temperature [°C]		5 to 60 (High-temperature type: 5 to 150)	
Operating pressure [Pa(abs)]		1 x 10 ⁻⁶ to atmospheric pressure	
Conductance [L/s]*1		300	800
Leakage [Pa·m ³ /s]	Internal	For standard seal material (FKM): 1.3 x 10 ⁻¹⁰ at normal temperature, excluding gas permeation	
	External	For standard seal material (FKM): 1.3 x 10 ⁻¹¹ at normal temperature, excluding gas permeation	
Flange type		KF (NW), K (DN)	
Principal materials		Body: Aluminium alloy Bellows: Stainless steel Chief part: Stainless steel, FKM (standard seal material)	
Surface treatment		External: Hard anodised Internal: Raw material	
Pilot pressure [MPa(G)]		0.4 to 0.6	
Pilot port size		Rc1/8	Rc1/4
Weight [kg]		8.7	14.5

*1 Conductance is the value for the elbow with the same dimensions.
* For valve heater specifications, refer to Common Option [1] Heater on page 5.

Construction/Operation



*1 Refer to Maintenance Parts on page 6.

<Working principle>

By applying pilot pressure from the pilot port P-1, the piston-coupled valve overcomes the operating force by the pressure, and the valve opens. (Pilot port P-2 is open.) Alternatively, by applying pilot pressure to pilot port P-2, the valve closes. (Pilot port P-1 is open.)

<Option>

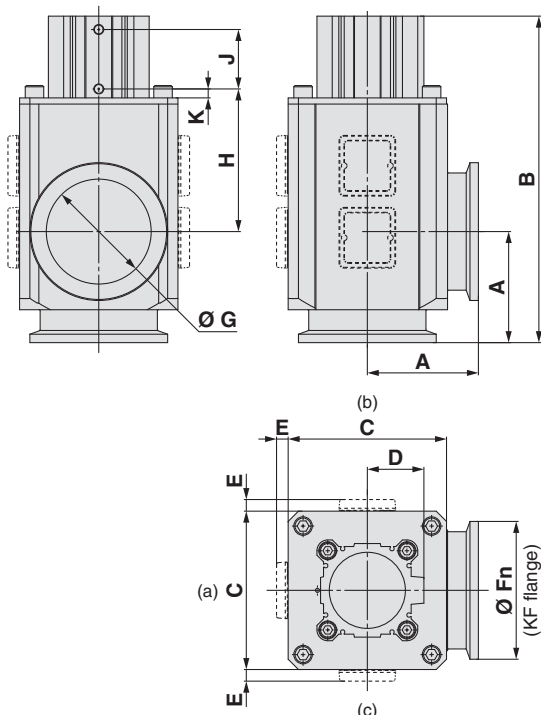
Auto switch: The magnet activates the auto switch. With 2 auto switches, the open and closed positions are detected, and with 1 auto switch, either the open or closed position is detected. The temperature range is only available for general use (5 to 60 °C).

Heater: Heating is performed simply using thermistors. The valve body can be heated to approximately 100 or 120 °C, depending on the size of the valve. The type and number of thermistors to be used will vary depending on the size and setting temperature. For the high-temperature type, the bonnet assembly is a heat-resistant structure. This does not apply in cases where a solenoid valve is attached.

Indicator: When the valve is open, an orange marker appears in the centre of the name plate.

Dimensions

XLC-100/160-1-X152: Air operated



[mm]										
Model	A	B	C	D	E*1	F _n	F _d	G	H	J
XLC-100-1-X152	108	317.5	154	55	11	134	130	102	139	58
XLC-160-1-X152	138	339	200	65	11	190	180	153	124	62

*1 The E dimension applies when the heater option is included. (Lead wire length: Approx. 1 m)

* (a), (b), (c) in the above drawing indicate heater mounting positions. Moreover, heater mounting positions will differ depending on the type of heater. For details, refer to Common Option [2] Mounting position of the heater on page 5.

XL□-100/160(-1)-X152 Common Option

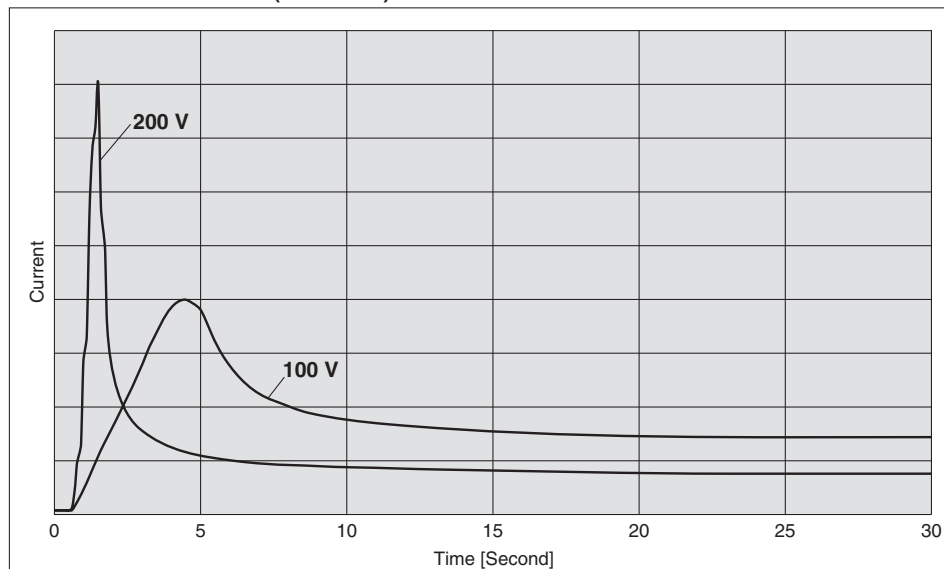
1 Heater

Valve heaters are common for models **XLA** and **XLC**. Power consumption specifications are shown below.

Model			XL□-100(-1)-X152	XL□-160(-1)-X152
Rated voltage for heater			90 to 240 VAC	
Heater assembly quantity used Heater power W (Nominal value) Inrush/Power consumption (Option symbol, Operating voltage)	Heater assembly quantity		2	3
	H4 100 °C	100 V	800/220	1200/350
		200 V	3200/240	4800/385
	Heater assembly quantity		3	4
	H5 120 °C	100 V	1200/300	1600/400
		200 V	4800/330	6400/440

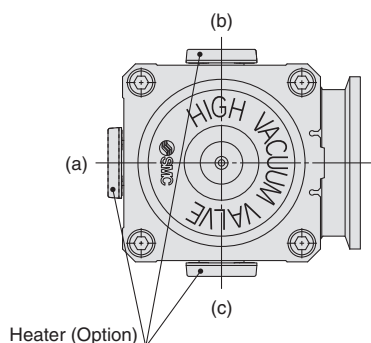
- * The inrush current of the heater flows for several tens of seconds when using 100 V, while it flows for several seconds when using 200 V. However, this inrush current will decrease shortly after.
- * When the valve uses multiple heater assemblies, do not turn on the power to each heater assembly at the same time. Turn on the power to each heater assembly one-by-one at intervals of 30 sec. since the inrush current is large.
- * The heater temperature will decrease several % from the start of heating and then becomes stable. (The heater temperature may decrease approximately 5 to 10 % due to individual differences.)
- * Refer to Maintenance Parts on page 6 for further details regarding quantity and type.
- * As the stable temperature of the heated product may vary by approx. ±10 to 15 % due to instrumental error, be aware that the temperature specifications are to be used as a guide only (H4: 100 °C and H5: 120 °C).

Inrush Current Flow Time (Reference)



2 Mounting Position of the Heater

Heater symbol	XL□-100(-1)-X152	XL□-160(-1)-X152
H4 (100 °C)	(b), (c)	(a), (b), (c)
H5 (120 °C)	(a), (b), (c)	(b), (c)





XL□-100/160(-1)-X152

Specific Product Precautions

Be sure to read this before handling the products.

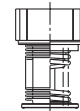
Maintenance Parts

Air operated angle valve



Caution

1. Replace the bonnet assembly when changing the seal material.
It may not be applicable when a seal material different from the current one has been chosen.



Bonnet assembly

Bonnet Assembly

Model	Temperature specification	Indicator	Valve size	
			100	160
XLA-X152	General use	None	XLA100-30-1-X152	XLA160-30-1-X152
		Yes	XLA100A-30-1-X152	XLA160A-30-1-X152
	High-temperature	None	XLA100-30-1H-X152	XLA160-30-1H-X152
		Yes	XLA100A-30-1H-X152	XLA160A-30-1H-X152
XLC-1-X152	General use	None	XLC100-30-1-1-X152	XLC160-30-1-1-X152
	High-temperature	None	XLC100-30-1H-1-X152	XLC160-30-1H-1-X152

- * In cases where the material of the valve seal is anything other than the standard (FKM: Compound no. 1349-80: made by MITSUBISHI CABLE INDUSTRIES, LTD.), add the symbol for the seal material (see Table 1) to the part number.
- * An auto switch magnet is not installed. In cases where an auto switch magnet is installed, add -M9// to the part number. (Not available for the high-temperature type)
- * An auto switch is not attached. When a product with an auto switch is required, add the symbol for the auto switch to the part number.

Example) In cases where the material of the valve seal is changed: XLA100-30-1-N1-X152

Exterior Seal/Valve Seal

Model	Description (Construction no.)	Material	Valve size	
			100	160
XLA-X152 XLC-1-X152	Exterior seal ③	Standard	AS568-050V	AS568-167V
		Special	AS568-050□	AS568-167□
	Valve seal ②	Standard	AS568-349V	B2401-G155V
		Special	AS568-349□	B2401-G155□

- * In cases where the seal material is anything other than the standard (FKM: Compound no. 1349-80: made by MITSUBISHI CABLE INDUSTRIES, LTD.), add the symbol for the seal material (see Table 1) to the end of the part number (in place of □).
- * Refer to the Construction section of each series for component part numbers.

Table 1: Symbol for Seal Material

Symbol	-XN1	-XP1	-XQ1	-XR1	-XR2	-XR3	-XS1	-XT1	-XU1	-XF1
Seal material	EPDM	Barrel Perfluoro®	Kalrez®	Chemraz®			VMQ	FKM for Plasma	ULTIC ARMOR®	FKM
Compound no.	2101-80*1	70W	4079	SS592	SS630	SSE38	1232-70*1	3310-75*1	UA4640	*2

- * It may not be applicable when a seal material different from the current one has been chosen.

*1 Produced by MITSUBISHI CABLE INDUSTRIES, LTD.

*2 Same specifications as the standard FKM type

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Replacement Heaters

Temperature specification	Valve size	
	100	160
H4 (100 °C heater)	XL1A25-60S-2 (2 sets)	XL1A25-60S-2 (3 sets)
H5 (120 °C heater)	XL1A25-60S-2 (3 sets)	XL1A25-60S-2 (4 sets)

Example) For the XL□-100H5-X152 with a heater, 3 sets of the XL1A25-60S-2 are required.

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.

-  **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.

- 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.

Warning

1. 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.

2. 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.

3. 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 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.

4. 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, combustion 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 specifications described in the product catalogue.
3. An application which could have negative effects on people, property, or animals 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.

Caution

1. 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.

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. ²⁾ 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.
3. Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalogue for the particular products.
- 2) 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.

Safety Instructions

Be sure to read “Handling Precautions for SMC Products” (M-E03-3) before using.

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