

Aluminum High Vacuum Angle Valve Series **XLF/XL FV** Normally Closed/O-ring Seal



XLF

How to Order

XLF - **16** **□** **□** **□** - **M9N** **A** - **□**

① ② ③ ④ ⑤ ⑥ ⑦

① Flange size

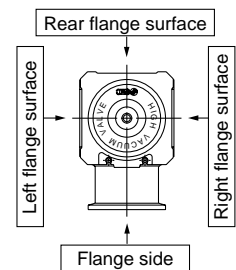
Size
16
25
40
50
63
80
100
160

② Flange type

Symbol	Type	Applicable flange
Nil	KF (NW)	16, 25, 40, 50, 63
D	K (DN)	63, 80, 100, 160

③ Indicator/Pilot port direction

Symbol	Indicator	Pilot port direction
Nil	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



④ Temperature specifications/Heater

Symbol	Temperature	Heater	
Nil	5 to 60°C	—	
High temperature type	H0	—	
	H2	5 to 150°C	With 100°C heater
	H3	—	With 120°C heater

Note) Size 16 is not applicable for H2, H3, Size 25 not for H2.

⑥ Switch quantity/Mounting position

Symbol	Qty	Mounting position
Nil	Without auto switch	—
A	2 pcs.	Valve open/closed
B	1 pc.	Valve open
C	1 pc.	Valve closed

⑤ Auto switch type

Symbol	Auto switch model	Remarks
Nil	—	Without auto switch (without built-in magnet)
M9N(L)	D-M9N(L)	Solid state switch
M9P(L)	D-M9P(L)	
M9B(L)	D-M9B(L)	
A90(L)	D-A90(L)	Reed switch (Not applicable to flange size 16)
A93(L)	D-A93(L)	—
M9//	—	Without auto switch (with built-in magnet)

Auto switches are not applicable for high temperature specifications (Temperature specifications H0, H2, H3). Standard lead wire length is 0.5 m. Add "L" to the end of the part number when 3 m is desired. Example) -M9NL

⑦ Body surface treatment/Seal material and its changed part

• Body surface treatment

Symbol	Surface treatment
Nil	External: Hard anodized Internal: Raw material
A	External: Hard anodized Internal: Oxalic acid anodized

• Seal material

Symbol	Seal material	Compound No.
Nil	FKM	1349-80*
N1	EPDM	2101-80*
P1	Barrel Perfluoro®	70W
Q1	Kalrez®	4079
R1	Chemraz®	SS592
R2		SS630
R3		SSE38
S1	VMQ	1232-70*
T1	FKM for Plasma	3310-75*
U1	ULTIC ARMOR®	UA4640

* Produced by Mitsubishi Cable Industries, Ltd.

• Seal material changed part and leakage

Symbol	Changed part ^{Note 2)}	Leakage (Pa·m ³ /s or less) ^{Note 1)}	
		Internal	External
Nil	None	1.3 x 10 ⁻¹⁰ (FKM)	1.3 x 10 ⁻¹⁰ (FKM)
A	②, ③	1.3 x 10 ⁻⁸	1.3 x 10 ⁻⁸
B	②	1.3 x 10 ⁻⁸	1.3 x 10 ⁻¹⁰ (FKM)
C	③	1.3 x 10 ⁻¹⁰ (FKM)	1.3 x 10 ⁻⁸

Note 1) Values at normal temperature, excluding gas permeation.

Note 2) Refer to parts number of "Construction" on page 11 for changed part. Number indicates parts number of "Construction" accordingly.

To order something other than "Nil" (standard), list the symbols starting with "X," followed by each symbol for "body surface treatment," "seal material" and then "changed part".

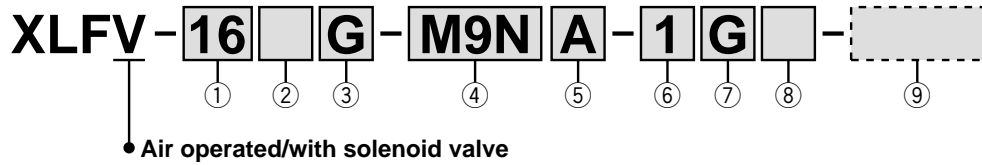
Example) XLF-16-M9NA-**XAN1A**

Air Operated/with Solenoid Valve



XLFV

How to Order



① Flange size

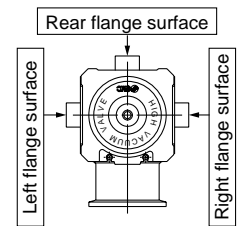
Size
16
25
40
50
63
80
100
160

② Flange type

Symbol	Type	Applicable flange
Nil	KF (NW)	16, 25, 40, 50, 63
D	K (DN)	63, 80, 100, 160

③ Indicator/Pilot port direction

Symbol	Indicator	Pilot port direction
F	With indicator	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



* M type plug connector (AC power supply) not attached for J, M of sizes 16 and 25.

④ Auto switch type

Symbol	Auto switch model	Remarks
Nil	—	Without auto switch (without built-in magnet)
M9N(L)	D-M9N(L)	Solid state switch
M9P(L)	D-M9P(L)	
M9B(L)	D-M9B(L)	
A90(L)	D-A90(L)	Reed switch (Not applicable to flange size 16)
A93(L)	D-A93(L)	
M9//	—	Without auto switch (with built-in magnet)

Standard lead wire length is 0.5 m. Add "L" to the end of the part number when 3 m is desired.
Example) -M9NL

⑤ Switch quantity/Mounting position

Symbol	Qty	Mounting position
Nil	Without auto switch	—
A	2 pcs.	Valve open/closed
B	1 pc.	Valve open
C	1 pc.	Valve closed

⑥ Rated voltage

1	100 VAC, 50/60 Hz
2	200 VAC, 50/60 Hz
3	110 VAC, 50/60 Hz
4	220 VAC, 50/60 Hz
5	24 VDC
6	12 VDC

⑦ Electrical entry

G	Grommet (Lead wire length 300 mm)
H	Grommet (Lead wire length 600 mm)
L	L type plug connector
M	M type plug connector

⑧ Light/Surge voltage suppressor

Nil	None
S	With surge voltage suppressor
Z	With light/surge voltage suppressor
U	With light/surge voltage suppressor (Non-polar type)

* S type: Not available for AC.
* U type: DC only.

⑨ Body surface treatment/Seal material and its changed part

• Body surface treatment

Symbol	Surface treatment
Nil	External: Hard anodized Internal: Raw material
A	External: Hard anodized Internal: Oxalic acid anodized

• Seal material

Symbol	Seal material	Compound No.
Nil	FKM	1349-80*
N1	EPDM	2101-80*
P1	Barrel Perfluoro®	70W
Q1	Kalrez®	4079
R1	Chemraz®	SS592
R2		SS630
R3		SSE38
S1	VMQ	1232-70*
T1	FKM for Plasma	3310-75*
U1	ULTIC ARMOR®	UA4640

* Produced by Mitsubishi Cable Industries, Ltd.

• Seal material changed part and leakage

Symbol	Changed part ^{Note 2)}	Leakage (Pa·m ³ /s or less) ^{Note 1)}	
		Internal	External
Nil	None	1.3 x 10 ⁻¹⁰ (FKM)	1.3 x 10 ⁻¹⁰ (FKM)
A	②, ③	1.3 x 10 ⁻⁸	1.3 x 10 ⁻⁸
B	②	1.3 x 10 ⁻⁸	1.3 x 10 ⁻¹⁰ (FKM)
C	③	1.3 x 10 ⁻¹⁰ (FKM)	1.3 x 10 ⁻⁸

Note 1) Values at normal temperature, excluding gas permeation.

Note 2) Refer to parts number of "Construction" on page 11 for changed part. Number indicates parts number of "Construction" accordingly.

To order something other than "Nil" (standard), list the symbols starting with "X," followed by each symbol for "body surface treatment," "seal material" and then "changed part".

Example) XLFV-16-M9NA-1G-XAN1A

Note 1) Option specifications/Combinations

This model has indicator, auto switch and K(DN) flange options, but high temperature/heater options are not available.

Note 2) Solenoid valves

XLFV-16, 25, 40: SYJ319, XLFV-50, 63, 80, 100, 160: SYJ519

Example) SYJ319-1GS.

For further details on solenoid valves, refer to the SMC solenoid valve catalog "SYJ300/500/700" (ES11-86).

Series XLF/XLFV

Specifications

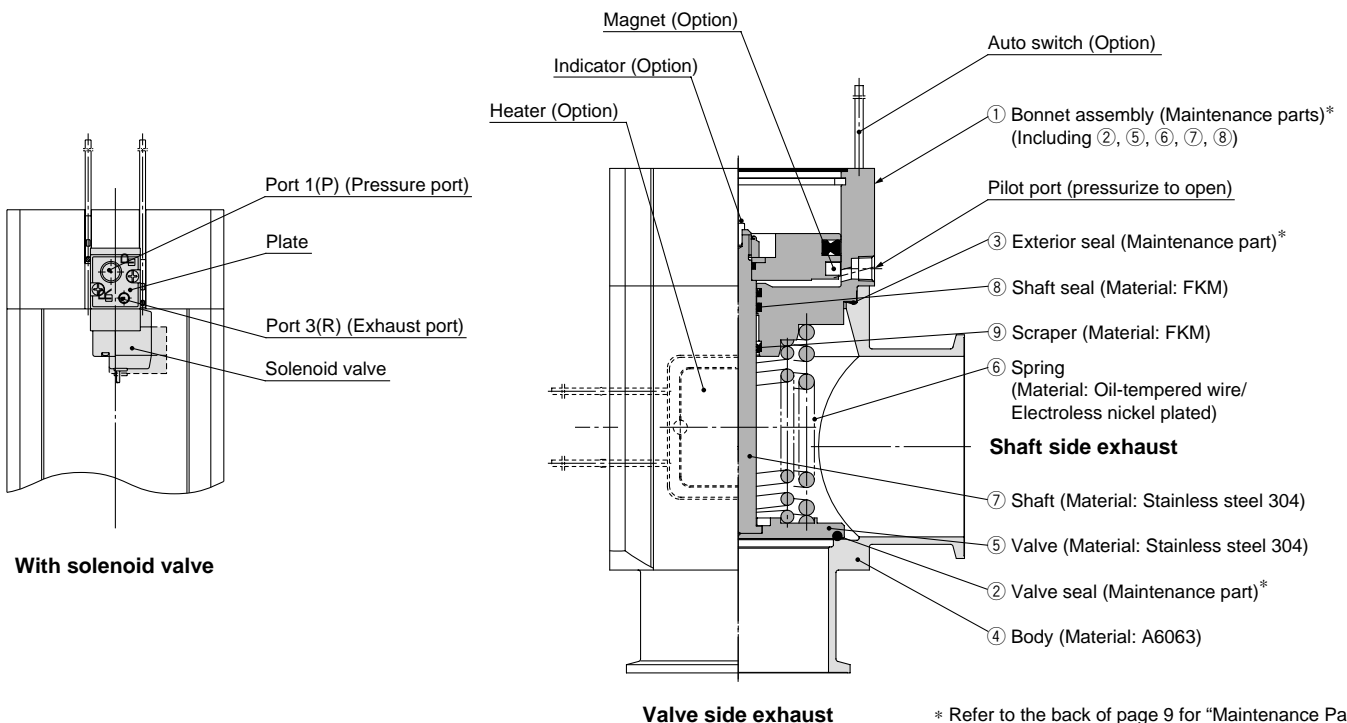
Model		XLF(V)-16	XLF(V)-25	XLF(V)-40	XLF(V)-50	XLF(V)-63	XLF(V)-80	XLF(V)-100	XLF(V)-160
Valve type		Normally closed (Pressurize to open, Spring seal)							
Fluid		Inert gas under vacuum							
Operating temperature (°C)	XLF	5 to 60 (High temperature type: 5 to 150)							
	XLFV	5 to 50							
Operating pressure (Pa)		Atmospheric pressure to 1×10^{-5} (760 to 7.5×10^{-8})							
Conductance (ds) ^{Note 1)}		5	14	45	80	160	200	300	800
Leakage (Pa·m³/s)	Internal	In case of standard material FKM: 1.3×10^{-10} at normal temperature, excluding gas permeation							
	External	In case of standard material FKM: 1.3×10^{-10} at normal temperature, excluding gas permeation							
Flange type		KF (NW)				KF (NW), K (DN)			
Principal materials		Body: Aluminum alloy, Main part: Stainless steel, FKM (Standard seal material)							
Surface treatment		External: Hard anodized Internal: Raw material							
Pilot pressure (MPa)		0.4 to 0.7							
Pilot port size	XLF	M5			Rc1/8				Rc1/4
	XLFV	M5: Port 1(P), Port 3(R)			Rc1/8: Port 1(P), M5: Port 3(R)				
Weight (kg)	XLF	0.25	0.45	1.1	1.6	3.0	4.8	10	18
	XLFV	0.29	0.49	1.14	1.66	3.06	4.86	10.1	18.1

Note 1) Conductance is the value for an elbow with the same dimensions.

Note 2) For valve heater specifications, refer to "Common Option [1] Heater" on page 47.

Note 3) A coating of vacuum grease [Y-VAC2] is applied to the seal-material sliding portion of the vacuum part.

Construction/Operation



* Refer to the back of page 9 for "Maintenance Parts".

<Working principle>

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

In the case of the XLFV, port 1(P) is normally pressurized, and the valve opens when the solenoid valve is turned ON and closes when it is turned OFF.

<Options>

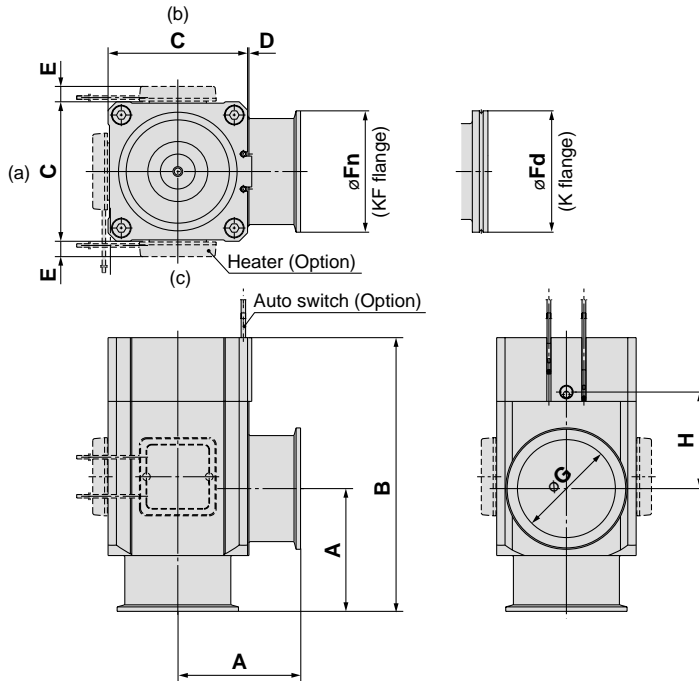
Auto switch: The magnet activates the auto switch. With 2 auto switches, the open and closed positions are detected, and with 1 auto switch, either the open or closed position is detected. Auto switches are applicable at ordinary temperatures only (5 to 60°C).

Heater: Simple heating is performed using thermistors. The valve body can be heated to approximately 100 or 120°C, depending on the heater option and the valve size. The type and number of thermistors to be used will vary depending upon size and setting temperature. In the case of high temperature specifications, 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 center of the name plate.

Dimensions

XLF/Air operated



Model	A	B	C	D	E ^{Note 1)}	Fn	Fd	G	H
XLF-16	40	103	38	1	—	30	—	17	40
XLF-25	50	113	48	1	12	40	—	26	39
XLF-40	65	158	66	2	11	55	—	41	63
XLF-50	70	170	79	2	11	75	—	52	68
XLF-63	88	196	100	3	11	87	95	70	69
XLF-80	90	235	117	3	11	114	110	83	96
XLF-100	108	300	154	3	11	134	130	102	131
XLF-160	138	315	200	3	11	190	180	153	112

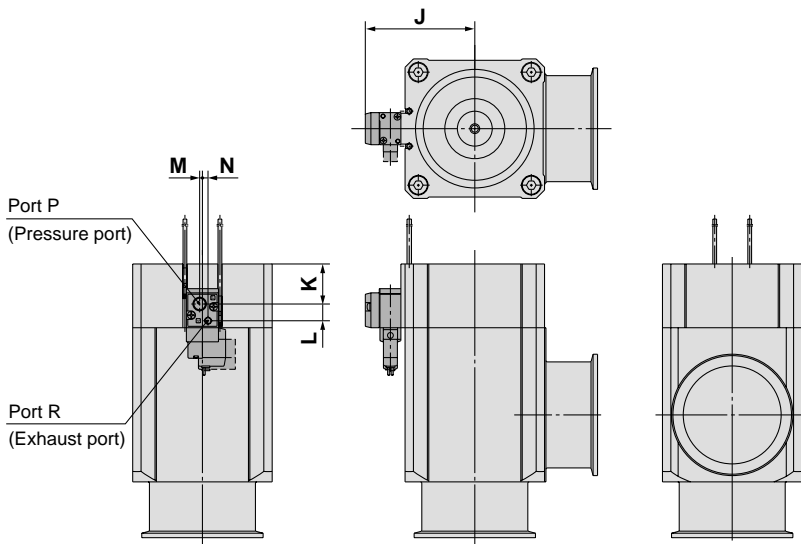
Note 1) Dimension E applies when heater option is included. (Lead wire length: approx. 1 m)

Note 2) (a), (b) and (c) in the above drawing indicate heater mounting positions.

Moreover, heater mounting positions will differ depending on the type of heater.

For further details, refer to mounting positions under "Replacement Heaters" on the back of page 9.

XLFV/With solenoid valve



Model	J	K	L	M	N
XLFV-16	35.5	13.4	8.5	3	2.7
XLFV-25	40.5	15	8.5	3	2.7
XLFV-40	50.5	22.7	8.5	3	2.7
XLFV-50	67	21.7	12	4	2
XLFV-63	78.5	28.7	12	4	2
XLFV-80	87	38.7	12	4	2
XLFV-100	105.5	49.7	12	4	2
XLFV-160	128.5	58	12	4	2

* Other dimensions are the same as the XLF.

Note) For further details on solenoid valves, refer to the SMC solenoid valve catalog "SYJ300/500/700" (ES11-86).

How to Order Valve

XLFR-80 - **M9N** **A** - **1K** - X

Main valve: Indicator/
Pilot port direction

Symbol	Indicator	Pilot port direction
Nil	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

Temperature specifications

Symbol	Temperature
Nil	5 to 60°C
H0	5 to 150°C

Seal material

Symbol	Seal material	Compound No.
Nil	FKM	1349-80
N1	EPDM	2101-80
P1	Barrel Perfluoro®	70W
Q1	Kalrez®	4079
R1	Chemraz®	SS592
R2		SS630
R3		SSE38
S1	VMQ	1232-70
T1	FKM FOR PLASMA	3310-75
U1	ULTIC ARMOR®	UA4640

* Flange: (A)

Auto switch type
(Operating temperature 5 to 60°C)

Symbol	Auto switch model	Switch type
Nil	—	Without auto switch (without built-in magnet)
M9N(L)	D-M9N(L)	Solid state switch
M9P(L)	D-M9P(L)	
M9B(L)	D-M9B(L)	
A90(L)	D-A90(L)	Reed switch
A93(L)	D-A93(L)	
M9//	Without auto switch (with built-in magnet)	

Note) Types with auto switches are not available in case of high temperature types.
L type: Lead wire length 3000 mm

By-pass valve mounting position/
Pilot port direction

Symbol	Mounting position	Symbol	Pilot port direction
1	Left flange surface	Nil	Flange side
		K	Left flange surface
		L	Rear flange surface
2	Right flange surface	Nil	Flange side
		L	Rear flange surface
		M	Right flange surface
3	Rear flange surface	K	Left flange surface
		L	Rear flange surface
		M	Right flange surface

Barrel Perfluoro® is a registered trademark of Matsumura Oil Co., Ltd.
Kalrez® is a registered trademark of DuPont Performance Elastomers.
Chemraz® is a registered trademark of Greene, Tweed & Co.
ULTIC ARMOR® is a registered trademark of Nippon Valqua Industries, Ltd.

Switch quantity/Mounting position

Symbol	Qty	Mounting position
Nil	Without auto switch	—
A	2 pcs.	Valve open/closed
B	1 pc.	Valve open
C	1 pc.	Valve closed

Seal material changed part

Symbol	Changed part	Leakage (Pa·m ³ /s or less) <small>Note</small>	
		Internal	External
Nil	None	1.3 x 10 ⁻⁹ (FKM)	1.3 x 10 ⁻⁹ (FKM)
A	(2-1) (8-1) (4) (8-2) (9)	1.3 x 10 ⁻⁷	1.3 x 10 ⁻⁷
B	(2-1) (8-1)	1.3 x 10 ⁻⁷	1.3 x 10 ⁻⁹ (FKM)
C	(4) (8-2) (9)	1.3 x 10 ⁻⁹ (FKM)	1.3 x 10 ⁻⁷

Note) Values at normal temperature, excluding gas permeation.

Maintenance Parts

① Body Part No.

XLAR80-1S-1

By-pass valve mounting position

Symbol	Mounting position
1	Left flange surface
2	Right flange surface
3	Rear flange surface

* Flange: (A)

⑧ By-pass Valve Part No.

XLA-16 - - X65

Pilot port direction

Symbol	Pilot port direction
Nil	Rear (as seen from body connection point)
K	Left (as seen from body connection point)
M	Right (as seen from body connection point)

Seal material changed part

Symbol	Changed part
Nil	None
A	(8-1) (8-2)
B	(8-1)
C	(8-2)

Temperature specifications

Symbol	Temperature
Nil	5 to 60°C
H0	5 to 150°C

Seal material: Same as the seal materials of How to Order Valve.

② Bonnet Assembly Part No.

XLF80A-30-1H - **M9NA-XN1**

Bonnet assembly

Temperature	Indicator	Part no.
5 to 60°C	Without indicator	XLF80-30-1
	With indicator	XLF80A-30-1
5 to 150°C	Without indicator	XLF80-30-1H
	With indicator	XLF80A-30-1H

Same as How to Order.

Specifications

Valve type	Main valve: Normally closed	By-pass valve: Normally closed
Shaft seal type	O-ring seal	Bellows seal
Operating pressure range	Atmospheric pressure to 1 x 10 ⁻⁵ Pa	
Fluid	Inert gas under vacuum	
Operating temperature	5 to 60°C (Option: 5 to 150°C)	
Conductance	200 ℓ /s	Max. 25 ℓ /s (Calculated value)
Operating pressure	0.4 to 0.7 MPa	
Flange	KF80	

How to Order Valve

XLFR-100 - **M9N** **A** - **1K** - **X**

Main valve: Indicator/
Pilot port direction

Symbol	Indicator	Pilot port direction
Nil	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

* Flange: (A)

Temperature specifications

Symbol	Temperature
Nil	5 to 60°C
H0	5 to 150°C

Seal material

Symbol	Seal material	Compound No.
Nil	FKM	1349-80
N1	EPDM	2101-80
P1	Barrel Perfluoro®	70W
Q1	Kalrez®	4079
R1	Chemraz®	SS592
R2		SS630
R3		SS638
S1	VMQ	1232-70
T1	FKM FOR PLASMA	3310-75
U1	ULTIC ARMOR®	UA4640

Barrel Perfluoro® is a registered trademark of Matsumura Oil Co., Ltd.
Kalrez® is a registered trademark of DuPont Performance Elastomers.
Chemraz® is a registered trademark of Greene, Tweed & Co.
ULTIC ARMOR® is a registered trademark of Nippon Valqua Industries, Ltd.

Auto switch type

Symbol	Auto switch model	Switch type
Nil	—	Without auto switch (without built-in magnet)
M9N(L)	D-M9N(L)	Solid state switch
M9P(L)	D-M9P(L)	
M9B(L)	D-M9B(L)	
A90(L)	D-A90(L)	Reed switch
A93(L)	D-A93(L)	
M9//	Without auto switch (with built-in magnet)	

Note 1) L type: Lead wire length 3000 mm

Note 2) Types with auto switches are not available in case of high temperature types.

Switch quantity/Mounting position

Symbol	Qty	Mounting position
Nil	Without auto switch	—
A	2 pcs.	Valve open/closed
B	1 pc.	Valve open
C	1 pc.	Valve closed

By-pass valve mounting position/Pilot port direction

Symbol	Mounting position	Symbol	Pilot port direction
1	Left flange surface	Nil	Flange side
		K	Left flange surface
		L	Rear flange surface
2	Right flange surface	Nil	Flange side
		L	Rear flange surface
		M	Right flange surface
3	Rear flange surface	K	Left flange surface
		L	Rear flange surface
		M	Right flange surface

* Flange: (A)

Seal material changed part

Symbol	Changed part	Leakage (Pa·m ³ /s or less) ^{Note)}	
		Internal	External
Nil	None	1.3 x 10 ⁻⁹ (FKM)	1.3 x 10 ⁻⁹ (FKM)
A	(2-1) (8-1) (4) (8-2) (9)	1.3 x 10 ⁻⁷	1.3 x 10 ⁻⁷
B	(2-1) (8-1)	1.3 x 10 ⁻⁷	1.3 x 10 ⁻⁹ (FKM)
C	(4) (8-2) (9)	1.3 x 10 ⁻⁹ (FKM)	1.3 x 10 ⁻⁷

Note) Values at normal temperature, excluding gas permeation.

Maintenance Parts

① Body Part No.

XLAR100-1S-1

By-pass valve mounting position

Symbol	Mounting position
1	Left flange surface
2	Right flange surface
3	Rear flange surface

⑧ By-pass Valve Part No.

XLA-16 - - **X65**

Pilot port direction

Symbol	Pilot port direction
Nil	Rear (as seen from body connection point)
K	Left (as seen from body connection point)
M	Right (as seen from body connection point)

Seal material changed part

Symbol	Changed part
Nil	None
A	(8-1) (8-2)
B	(8-1)
C	(8-2)

② Bonnet Assembly Part No.

XLF100A-30-1 - **M9NA-XN1**

Temperature specifications

Symbol	Temperature
Nil	5 to 60°C
H0	5 to 150°C

Bonnet assembly

Temperature	Indicator	Part no.
5 to 60°C	Without indicator	XLF100-30-1
	With indicator	XLF100A-30-1
5 to 150°C	Without indicator	XLF100-30-1H
	With indicator	XLF100A-30-1H

Specifications

Valve type	Main valve: Normally closed	By-pass valve: Normally closed
Shaft seal type	O-ring seal	Bellows seal
Operating pressure range	Atmospheric pressure to 1 x 10 ⁻⁵ Pa	
Fluid	Inert gas under vacuum	
Operating temperature	5 to 60°C (Option: 5 to 150°C)	
Conductance	300 ℓ/s	Max. 31.5 ℓ/s (Calculated value)
Operating pressure	0.4 to 0.7 MPa	
Flange	KF100	

Same as How to Order.

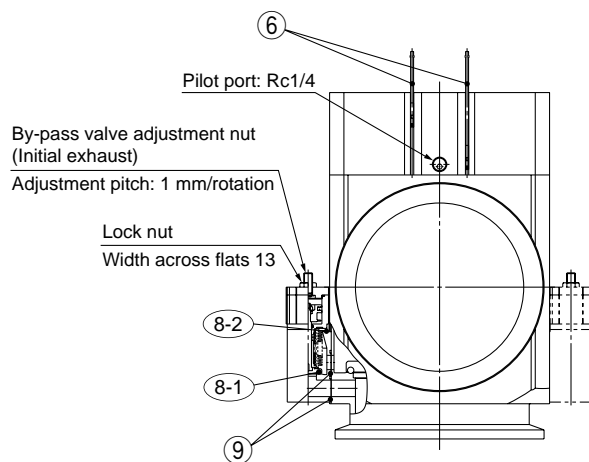
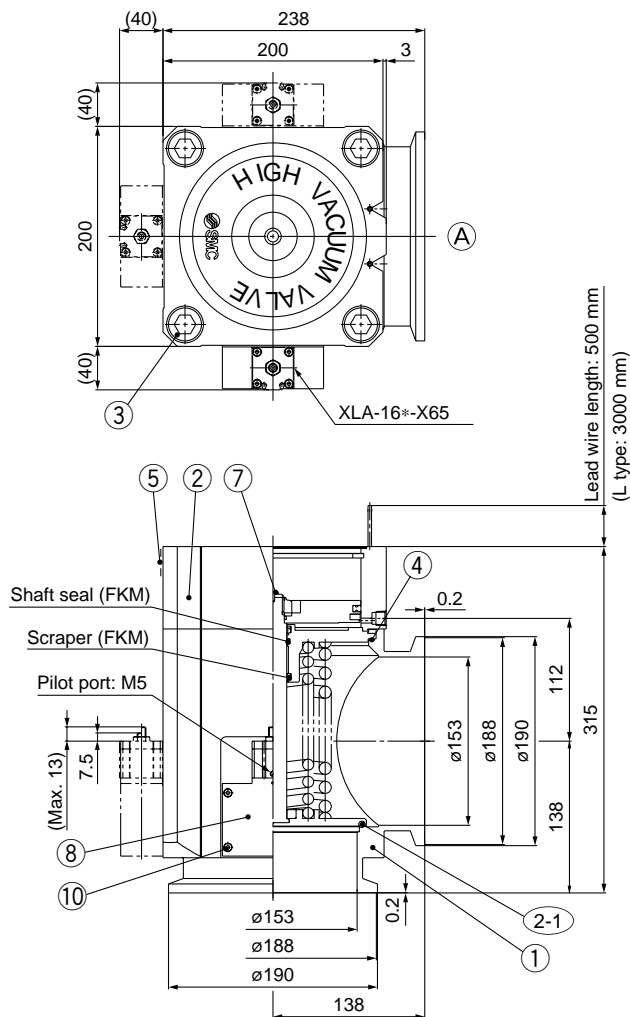
Seal material: Same as the seal materials of How to Order Valve.

Specifications

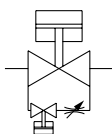
Valve type	Main valve: Normally closed	By-pass valve: Normally closed
Shaft seal type	O-ring seal	Bellows seal
Operating pressure range	Atmospheric pressure to 1 x 10 ⁻⁵ Pa	
Fluid	Inert gas under vacuum	
Operating temperature	5 to 60°C (Option: 5 to 150°C)	
Conductance	200 ℓ/s	Max. 25 ℓ/s (Calculated value)
Operating pressure	0.4 to 0.7 MPa	
Flange	KF80	



With By-pass Valve (Flange size: 160)



Symbol



O-ring Part No.

Seal material symbol	Internal seal (2-1)	External seal (4)
Nil	B2401-G155V	AS568-167V
N1	B2401-G155-XN1	AS568-167-XN1
P1	B2401-G155-XP1	AS568-167-XP1
Q1	B2401-G155-XQ1	AS568-167-XQ1
R1	B2401-G155-XR1	AS568-167-XR1
R2	B2401-G155-XR2	AS568-167-XR2
R3	B2401-G155-XR3	AS568-167-XR3
S1	B2401-G155-XS1	AS568-167-XS1
T1	B2401-G155-XT1	AS568-167-XT1
U1	B2401-G155-XU1	AS568-167-XU1

Component Parts

No.	Description	Material	Remarks
1	Body	A6063-T6	Refer to part no.
2	Bonnet assembly		Refer to part no.
2-1	O-ring		Refer to part no.
3	Hexagon socket head cap screw	SUSXM7	M20, ℓ = 70
4	O-ring		Refer to part no.
5	Computer name plate		
6	Auto switch		Option
7	Indicator	A5056	Option
8	By-pass valve		Refer to part no.
8-1	O-ring		Refer to part no.
8-2	O-ring		Refer to part no.
9	O-ring		Refer to part no.
10	Hexagon socket head cap screw	SUSXM7	M4, ℓ = 40

O-ring Part No.

Seal material symbol	Internal seal (8-1)	External seal (8-2)	External seal (9)
Nil	B2401-V15V	AS568-025V	AS568-017V
N1	B2401-V15-XN1	AS568-025-XN1	AS568-017-XN1
P1	B2401-V15-XP1	AS568-025-XP1	AS568-017-XP1
Q1	B2401-V15-XQ1	AS568-025-XQ1	AS568-017-XQ1
R1	B2401-V15-XR1	AS568-025-XR1	AS568-017-XR1
R2	B2401-V15-XR2	AS568-025-XR2	AS568-017-XR2
R3	B2401-V15-XR3	AS568-025-XR3	AS568-017-XR3
S1	B2401-V15-XS1	AS568-025-XS1	AS568-017-XS1
T1	B2401-V15-XT1	AS568-025-XT1	AS568-017-XT1
U1	B2401-V15-XU1	AS568-025-XU1	AS568-017-XU1

Note) A coating of vacuum grease (fluorinated grease: Y-VAC2) is applied to the shaft seal, scraper and O-ring (9).

How to Order Valve

XLFR-160 - **M9N** **A** - **1K** - X

Main valve: Indicator/
Pilot port direction

Symbol	Indicator	Pilot port direction
Nil	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

* Flange: (A)

Temperature specifications

Symbol	Temperature
Nil	5 to 60°C
H0	5 to 150°C

Switch quantity/Mounting position

Symbol	Qty	Mounting position
Nil	Without auto switch	—
A	2 pcs.	Valve open/closed
B	1 pc.	Valve open
C	1 pc.	Valve closed

Seal material

Symbol	Seal material	Compound No.
Nil	FKM	1349-80
N1	EPDM	2101-80
P1	Barrel Perfluoro®	70W
Q1	Kalrez®	4079
R1	Chemraz®	SS592
R2		SS630
R3		SS638
S1	VMQ	1232-70
T1	FKM FOR PLASMA	3310-75
U1	ULTIC ARMOR®	UA4640

Barrel Perfluoro® is a registered trademark of Matsumura Oil Co., Ltd.
Kalrez® is a registered trademark of DuPont Performance Elastomers.
Chemraz® is a registered trademark of Greene, Tweed & Co.
ULTIC ARMOR® is a registered trademark of Nippon Valqua Industries, Ltd.

Auto switch type

Symbol	Auto switch model	Switch type
Nil	—	Without auto switch (without built-in magnet)
M9N(L)	D-M9N(L)	Solid state switch
M9P(L)	D-M9P(L)	
M9B(L)	D-M9B(L)	
A90(L)	D-A90(L)	Reed switch
A93(L)	D-A93(L)	
M9//	Without auto switch (with built-in magnet)	

Note 1) L type: Lead wire length 3000 mm

Note 2) Types with auto switches are not available in case of high temperature types.

By-pass valve mounting position/Pilot port direction

Symbol	Mounting position	Symbol	Pilot port direction
1	Left flange surface	Nil	Flange side
		K	Left flange surface
		L	Rear flange surface
2	Right flange surface	Nil	Flange side
		L	Rear flange surface
		M	Right flange surface
3	Rear flange surface	K	Left flange surface
		L	Rear flange surface
		M	Right flange surface

* Flange: (A)

Seal material changed part

Symbol	Changed part	Leakage (Pa·m ³ /s or less) <small>Note)</small>	
		Internal	External
Nil	None	1.3 x 10 ⁻⁹ (FKM)	1.3 x 10 ⁻⁹ (FKM)
A	(2-1) (8-1) (4) (8-2) (9)	1.3 x 10 ⁻⁷	1.3 x 10 ⁻⁷
B	(2-1) (8-1)	1.3 x 10 ⁻⁷	1.3 x 10 ⁻⁹ (FKM)
C	(4) (8-2) (9)	1.3 x 10 ⁻⁹ (FKM)	1.3 x 10 ⁻⁷

Note) Values at normal temperature, excluding gas permeation.

Maintenance Parts

① Body Part No.

XLAR160-1S-1

By-pass valve mounting position

Symbol	Mounting position
1	Left flange surface
2	Right flange surface
3	Rear flange surface

⑧ By-pass Valve Part No.

XLA-16 - - **X65**

Pilot port direction

Symbol	Pilot port direction
Nil	Rear (as seen from body connection point)
K	Left (as seen from body connection point)
M	Right (as seen from body connection point)

Seal material changed part

Symbol	Changed part
Nil	None
A	(8-1) (8-2)
B	(8-1)
C	(8-2)

② Bonnet Assembly Part No.

XLF160A-30-1 - **M9NA-XN1**

Temperature specifications

Symbol	Temperature
Nil	5 to 60°C
H0	5 to 150°C

Bonnet assembly

Temperature	Indicator	Part no.
5 to 60°C	Without indicator	XLF160-30-1
	With indicator	XLF160A-30-1
5 to 150°C	Without indicator	XLF160-30-1H
	With indicator	XLF160A-30-1H

Same as
How to Order.

Specifications

Valve type	Main valve: Normally closed	By-pass valve: Normally closed
Shaft seal type	O-ring seal	Bellows seal
Operating pressure range	Atmospheric pressure to 1 x 10 ⁻⁵ Pa	
Fluid	Inert gas under vacuum	
Operating temperature	5 to 60°C (Option: 5 to 150°C)	
Conductance	800 μ /s	Max. 31.5 μ /s (Calculated value)
Operating pressure	0.4 to 0.7 MPa	
Flange	KF160	

Specifications

Valve type	Main valve: Normally closed	By-pass valve: Normally closed
Shaft seal type	O-ring seal	Bellows seal
Operating pressure range	Atmospheric pressure to 1 x 10 ⁻⁵ Pa	
Fluid	Inert gas under vacuum	
Operating temperature	5 to 60°C (Option: 5 to 150°C)	
Conductance	200 μ /s	Max. 25 μ /s (Calculated value)
Operating pressure	0.4 to 0.7 MPa	
Flange	KF80	

Seal material: Same as the seal materials of How to Order Valve.