High Vacuum Angle Valve

Series XLA, XLAV

Normally Closed/Bellows Seal

Air Operated Type

How to Order

XLA — 16 □ □ □ — M9N □ — □

High vacuum angle valve
(Normally closed, bellows seal, air operated type)

Flange size

16
25
40
50
63
80
100
160

Flange type

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

Indicator/Actuation port direction

Nil	Without indicator/Flange side
A	With indicator/Flange side
F	With indicator/Left flange surface
G	With indicator/Rear flange surface
J	With indicator/Right flange surface
K	Without indicator/Left flange surface
L	Without indicator/Rear flange surface
M	Without indicator/Right flange surface

Note) Actuation port direction
(Example) Left flange surface: Indicates that the direction of the actuation port is to the left side when the flange surface is viewed from the front.

Number of switches/ Mounting position

Symbol	Quantity	Mounting position
Nil	—	—
A	2 pcs.	Valve open/closed
B	1 pc.	Valve open
C	1 pc.	Valve closed

Type of auto switch

Symbol	Auto switch	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 (Flange size 16 is not available.)
A93 (L)	D-A93 (L)	
M9//	—	Without auto switch (with built-in magnet)

Note 1) Auto switches cannot be mounted in the case of high temperature types (temperature specifications H0). The standard lead wire length is 0.5 m. For 3 m, "L" is added at the end of the part number. (Example) -M9N**L**

Note 2) The auto switch should be secured against the stopper in the auto switch groove for detection of valve opening, or secured against a stopper or the valve body (depending on the valve size) for detection of valve closing.

Temperature specifications/Heater

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

* Heater options
H2: Not available for XLA16/25.
H3: Not available for XLA16.

Option
Refer to "Seal material, part number and specification" on page 38.

XLA

Option specifications/Combination table

Option specifications		Symbol	Model							
			XLA-16	XLA-25	XLA-40	XLA-50	XLA-63	XLA-80	XLA-100	XLA-160
Indicator		A	•	•	•	•	•	•	•	•
High temp. type	Without heater	H0	•	•	•	•	•	•	•	•
	With heater for 100°C	H2	—	—	•	•	•	•	•	•
	With heater for 120°C	H3	—	•	•	•	•	•	•	•

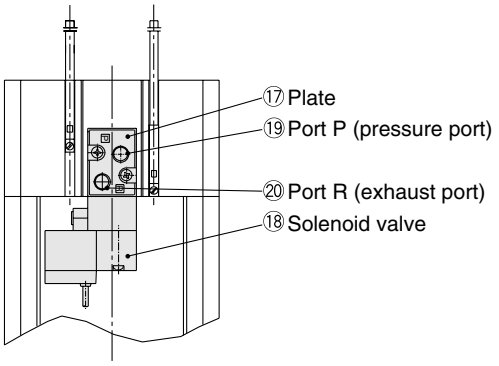
Note) Auto switches cannot be mounted in the case of high temperature types.

Specifications

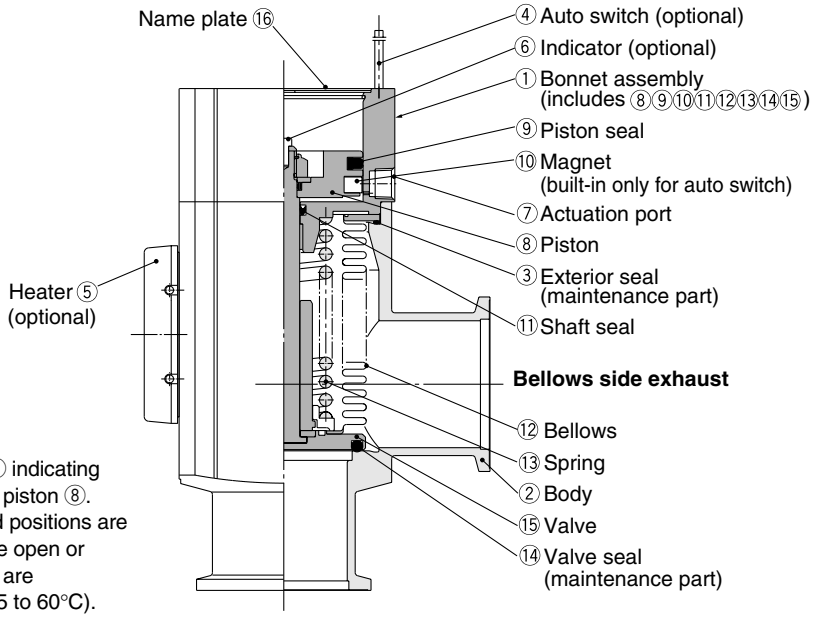
Model		XLA(V)-16	XLA(V)-25	XLA(V)-40	XLA(V)-50	XLA(V)-63	XLA(V)-80	XLA(V)-100	XLA(V)-160
Valve type		Normally closed (Pressurize to open, Spring seal)							
Fluid		Non-corrosive gas for aluminum alloy (A6063) and SUS304/316							
Operating temperature °C	XLA	5 to 60 (High temperature type: 5 to 150)							
	XLAV	5 to 50							
Operating pressure Pa {Torr}		Atmospheric pressure to 1×10^{-6} {760 to 7.5×10^{-9}}							
Conductance ℓ/s Note 1)		5	14	45	80	160	200	300	800
Leakage Pa·m³/s {Torr ℓ/s}	Internal	1.3×10^{-10} {1×10^{-9}} at ordinary temperatures, excluding gas permeation (In case of standard material FKM)							
	External	1.3×10^{-11} {1×10^{-10}} at ordinary temperatures, excluding gas permeation (In case of standard material FKM)							
Flange type		KF (NW)					KF (NW), K (DN)		
Principle materials		Body: Aluminum alloy Bellows: Stainless steel Seal: FKM (Fluoro rubber)							
Surface treatment		Exterior: Hard anodized Interior: Bare surface							
Actuation pressure MPa {kgf/cm²}		0.4 to 0.7 {4 to 7}							
Actuation port size	XLA	M5		Rc (PT) 1/8					Rc 1/4
	XLAV	M5 (Ports P, R)				Rc (PT) 1/8 (Port P): M5 (Port R)			
Weight kg	XLA	0.25	0.45	1.1	1.6	2.9	5.0	10.6	18.5
	XLAV	0.29	0.49	1.14	1.64	2.96	5.06	10.7	18.6

Note 1) Conductance is the same as that of an elbow with the same dimensions.
Note 2) For valve heater specifications, refer to "Common Option Specifications, 1 Heaters" on page 26.

Construction/Operation



With solenoid valve



Valve side exhaust

<<Options>>

④ Auto switch: The magnet ⑩ actuates the auto switch ④ indicating the position of the integrated valve ⑮ and piston ⑧. 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).

⑤ Heater: Simple heating is performed using thermistors. The valve body can be heated to approximately 80, 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 ① is a heat resistant structure.

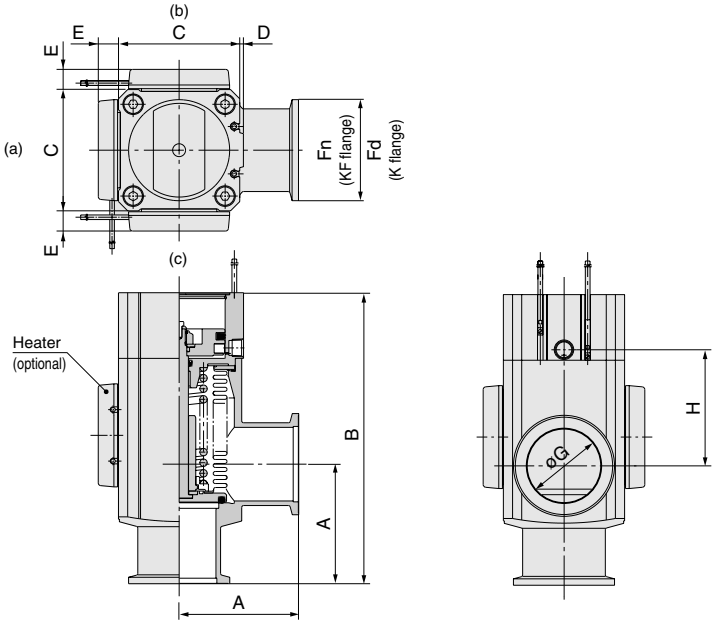
⑥ Indicator: When the valve is open, an orange marker about 1 mm in height appears in the center of the name plate ⑯.

<<Operation principle>>

By applying pressure from the actuation port ⑦, the piston ⑧, which is sealed by the shaft seal ⑪ and the piston seal ⑨, overcomes the force of the spring ⑬, and the valve ⑮ opens. With the exhaust of air pressure, the valve ⑮ is closed by the force of the spring ⑬ and is sealed by the valve seal ⑭.
In the case of the XLAV, port P ⑲ is normally pressurized, and the valve ⑮ opens when the solenoid valve ⑱ is turned ON and closes when it is turned OFF. Operation is the same as that of the XLA.

Dimensions

XLA/Air operated type

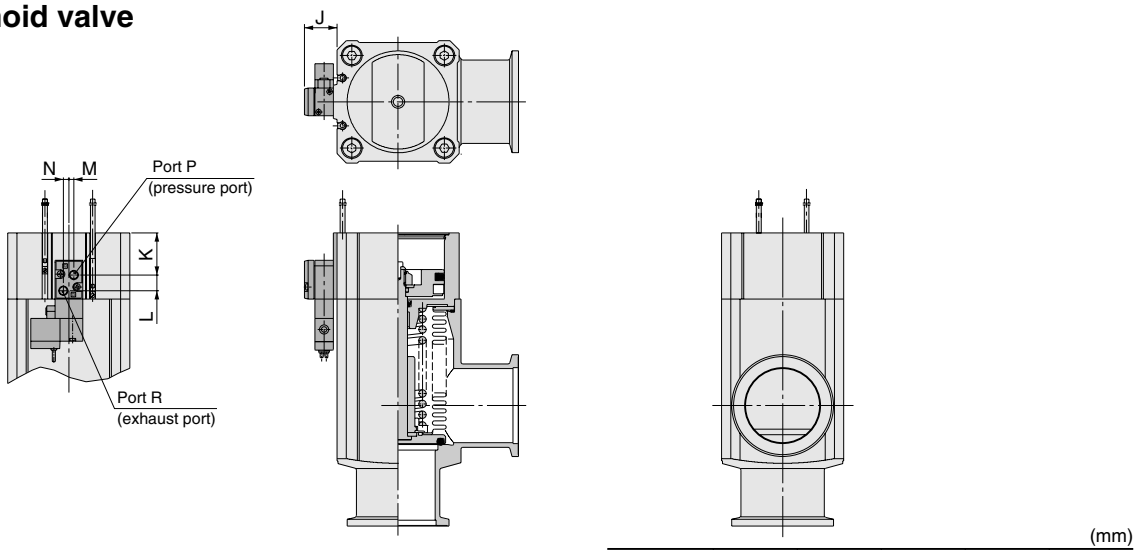


(mm)

Model	A	B	C	D	E Note 1)	Fn	Fd	G	H
XLA-16	40	103	38	1	—	30	—	17	40
XLA-25	50	113	48	1	12	40	—	26	39
XLA-40	65	158	66	2	11	55	—	41	63
XLA-50	70	170	79	2	11	75	—	52	68
XLA-63	88	196	100	3	11	87	95	70	69
XLA-80	90	235	117	3	11	114	110	83	96
XLA-100	108	300	154	3	11	134	130	102	131
XLA-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/Part Nos. on page 35.

XLAV/With solenoid valve



(mm)

Model	J	K	L	M	N
XLAV-16	16.5	13	8.5	3	3
XLAV-25	16.5	14	8.5	3	3
XLAV-40	17.5	23	8.5	3	3
XLAV-50	17.5	25	8.5	3	3
XLAV-63	29	29	12	4	2
XLAV-80	29	39	12	4	2
XLAV-100	29	51	12	4	2
XLAV-160	29	58	12	4	2

∗ Other dimensions are the same as XLA.

High Vacuum Angle Valve

Series XLC, XLCV

Double Acting/Bellows Seal

Air Operated Type

How to Order

XLC — 16 □ □ □ — M9N □ — □

Option
Refer to "Seal material, part number and specification" on page 38.

High vacuum angle valve
(Double acting, bellows seal, air operated type)

Flange size

16
25
40
50
63
80
100
160

Number of switches/ Mounting position

Symbol	Quantity	Mounting position
Nil	—	—
A	2 pcs.	Valve open/closed
B	1 pc.	Valve open
C	1 pc.	Valve closed

Flange type

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

Type of auto switch

Symbol	Auto switch	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 (Flange size 16 is not available.)
A93 (L)	D-A93 (L)	
M9//	—	Without auto switch (with built-in magnet)

Note 1) Auto switches cannot be mounted in the case of high temperature types (temperature specifications H0). The standard lead wire length is 0.5 m. For 3 m, "L" is added at the end of the part number. (Example) -M9NL

Note 2) The auto switch should be secured against the stopper in the auto switch groove for detection of valve opening, or secured against a stopper or the valve body (depending on the valve size) for detection of valve closing.

Actuation port direction

Nil	Flange side
K	Left flange surface
L	Rear flange surface
M	Right flange surface

Note) Actuation port direction
(Example) Left flange surface: Indicates that the direction of the actuation port is to the left side when the flange surface is viewed from the front.

Temperature specifications/Heater

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

* Heater options
H2: Not available for XLC16/25.
H3: Not available for XLC16.

XLC

High temperature type combination table

High temperature specifications	Symbol	Model							
		XLC-16	XLC-25	XLC-40	XLC-50	XLC-63	XLC-80	XLC-100	XLC-160
Without heater	H0	•	•	•	•	•	•	•	•
With heater for 100°C	H2	—	—	•	•	•	•	•	•
With heater for 120°C	H3	—	•	•	•	•	•	•	•

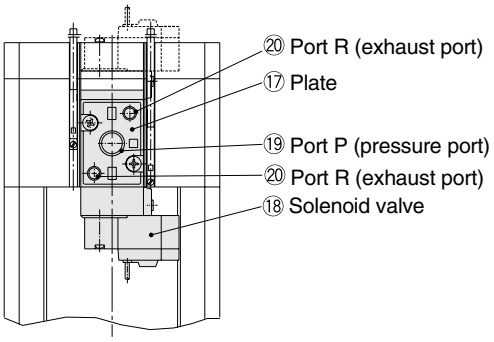
Note) Auto switches cannot be mounted in the case of high temperature types.

Specifications

Model		XLC(V)-16	XLC(V)-25	XLC(V)-40	XLC(V)-50	XLC(V)-63	XLC(V)-80	XLC(V)-100	XLC(V)-160
Valve type		Double acting (Dual operation), pressurize to open/close							
Fluid		Non-corrosive gas for aluminum alloy (A6063) and SUS304/316							
Operating temperature °C	XLC	5 to 60 (High temperature type: 5 to 150)							
	XLCV	5 to 50							
Operating pressure Pa {Torr}		Atmospheric pressure to 1×10^{-6} {760 to 7.5×10^{-9}}							
Conductance ℓ/s Note 1)		5	14	45	80	160	200	300	800
Leakage Pa·m³/s {Torr ℓ/s}	Internal	1.3×10^{-10} {1×10^{-9}} at ordinary temperatures, excluding gas permeation (In case of standard material FKM)							
	External	1.3×10^{-11} {1×10^{-10}} at ordinary temperatures, excluding gas permeation (In case of standard material FKM)							
Flange type		KF (NW)					KF (NW), K (DN)		
Principle materials		Body: Aluminum alloy Bellows: Stainless steel Seal: FKM (Fluoro rubber)							
Surface treatment		Exterior: Hard anodized Interior: Bare surface							
Actuation pressure MPa {kgf/cm²}		0.3 to 0.6 {3 to 6}							
Actuation port size	XLC	M5		Rc (PT) 1/8					Rc 1/4
	XLCV	M5 (Ports P, R1/R2)				Rc (PT) 1/8 (Port P): M5 (Port R1/R2)			
Weight kg	XLC	0.28	0.46	1.1	1.7	3.1	5.1	10.6	18.5
	XLCV	0.32	0.5	1.15	1.74	3.16	5.16	10.7	18.6

Note 1) Conductance is the same as that of an elbow with the same dimensions.
Note 2) For valve heater specifications, refer to "Common Option Specifications, 1 Heaters" on page 26.

Construction/Operation



With solenoid valve

<<Operating principle>>

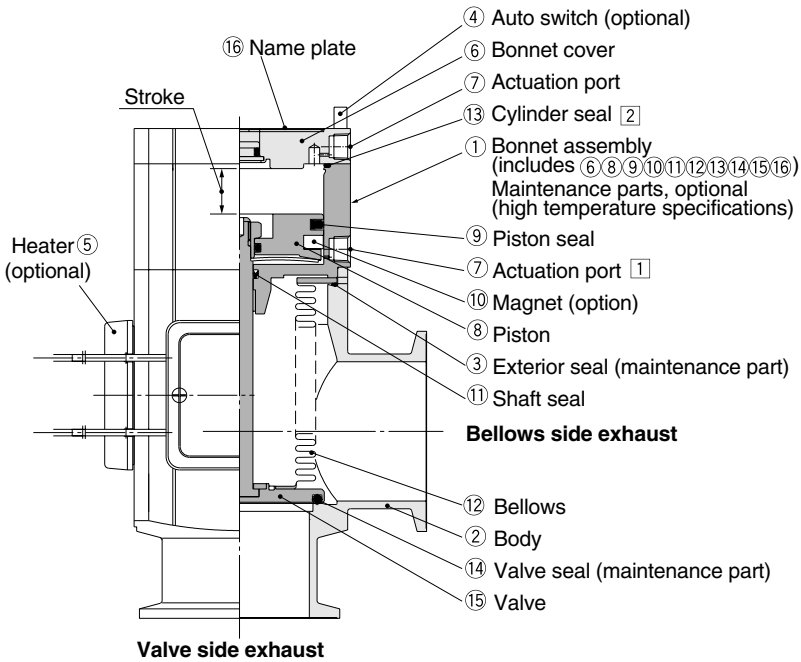
By applying pressure from the actuating port 1-⑦, the piston ⑧, sealed by the shaft seal ⑪ and the piston seal ⑨, is operated opening the valve. (actuation port 2-⑦ is released)

Conversely, by applying pressure to actuation port 2-⑦, the piston ⑧, sealed by the cylinder seal ⑬ and the piston seal ⑨, is operated closing the valve (15) which is sealed by the valve seal ⑭. (actuation port 1-⑦ is released)

In the case of the XLCV, port P ⑲ is normally pressurized, and the valve ⑮ opens when the solenoid valve ⑱ is turned ON, and closes when it is turned OFF.

Moreover, in the case of a double solenoid, the valve moves to the side where the solenoid valve ⑱ is turned ON. Operation is the same as that of the XLC.

For sizes 50, 63 and 80, the valve is sealed with a standard load by means of an overrun mechanism.



Valve side exhaust

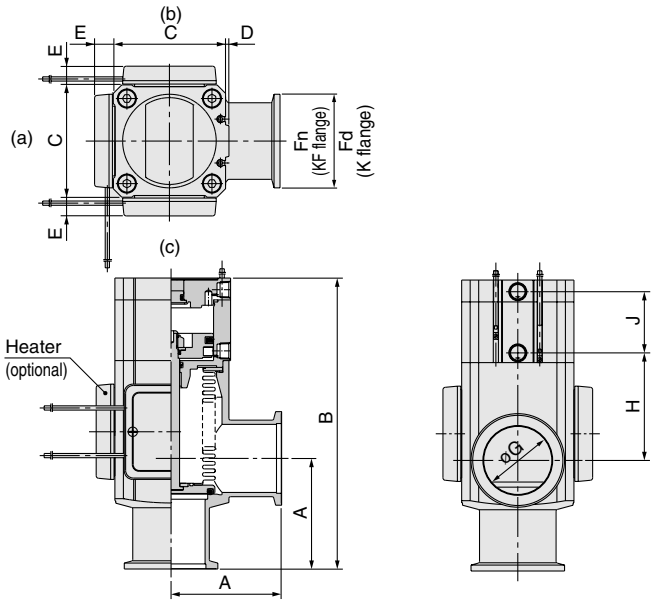
<<Options>>

④ Auto switch: The magnet ⑩ actuates the auto switch ④ indicating the position of the integrated valve ⑮ and piston ⑧. 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).

⑤ Heater: Simple heating is performed using thermistors. The valve body can be heated to approximately 80, 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 ① is a heat resistant structure.

Dimensions

XLC/Air operated type

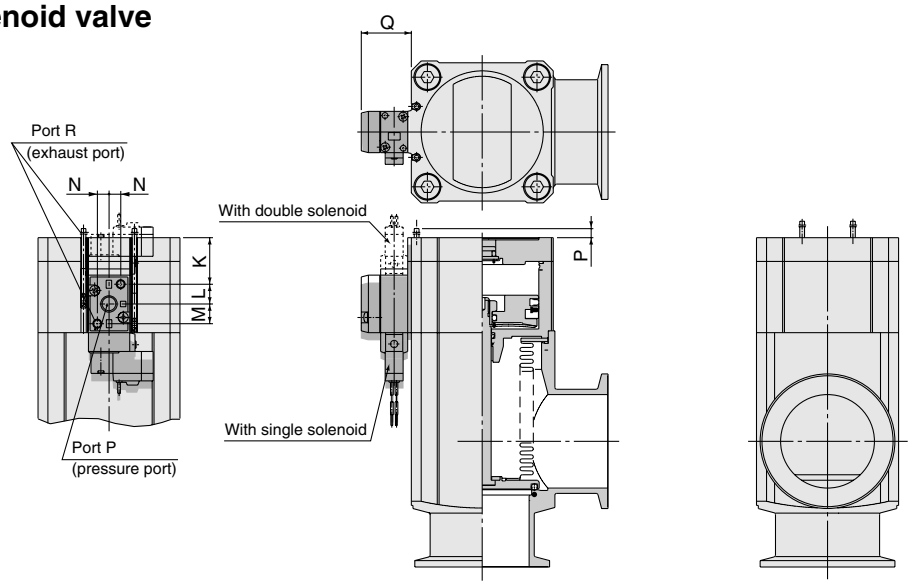


(mm)

Model	A	B	C	D	E Note 1)	Fn	Fd	G	H	J
XLC-16	40	110	38	1	—	30	—	17	40	26
XLC-25	50	120	48	1	12	40	—	26	39	28
XLC-40	65	171	66	2	11	55	—	41	63	36
XLC-50	70	183	79	2	11	75	—	52	68	38
XLC-63	88	209	100	3	11	87	95	70	69	45
XLC-80	90	250	117	3	11	114	110	83	96	56
XLC-100	108	317.5	154	3	11	134	130	102	131	69
XLC-160	138	339	200	3	11	190	180	153	112	75

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/Part Nos. on page 35.

XLCV/With solenoid valve



(mm)

Model	K	L	M	N	P	Q
XLCV-16	14	9	6.5	3	17	16.5
XLCV-25	16	9	6.5	3	15	16.5
XLCV-40	29	9	6.5	3	2	17.5
XLCV-50	42	9	6.5	3	6	17.5
XLCV-63	32	11	11	6.5	—	29
XLCV-80	45	11	11	6.5	—	29
XLCV-100	59	11	11	6.5	—	29
XLCV-160	72	11	11	6.5	—	29

∗ Other dimensions are the same as XLA.

High Vacuum Angle Valve

Series XLF, XLFV

Normally Closed/O-ring Seal

Air Operated Type

How to Order

XLF — 16 □ □ □ — M9N □

High vacuum angle valve
(Normally closed, O-ring seal, air operated type)

Flange size

16
25
40
50
63
80
100
160

Flange type

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

Indicator/Actuation port direction

Nil	Without indicator/Flange side
A	With indicator/Flange side
F	With indicator/Left flange surface
G	With indicator/Rear flange surface
J	With indicator/Right flange surface
K	Without indicator/Left flange surface
L	Without indicator/Rear flange surface
M	Without indicator/Right flange surface

Note) Actuation port direction
(Example) Left flange surface: Indicates that the direction of the actuation port is to the left side when the flange surface is viewed from the front.

Number of switches/Mounting position

Symbol	Quantity	Mounting position
Nil	—	—
A	2 pcs.	Valve open/closed
B	1 pc.	Valve open
C	1 pc.	Valve closed

Type of auto switch

Symbol	Auto switch	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 (Flange size 16 is not available.)
A93 (L)	D-A93 (L)	
M9//	—	Without auto switch (with built-in magnet)

Note 1) Auto switches cannot be mounted in the case of high temperature types (temperature specifications H0). The standard lead wire length is 0.5 m. For 3 m, "L" is added at the end of the part number. (Example) -M9NL

Note 2) The auto switch should be secured against the stopper in the auto switch groove for detection of valve opening, or secured against a stopper or the valve body (depending on the valve size) for detection of valve closing.

Temperature specifications/Heater

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

* Heater options
H2: Not available for XLF16/25.
H3: Not available for XLF16.

XLF

Option specifications/Combination table

Option specifications		Symbol	Model							
			XLF-16	XLF-25	XLF-40	XLF-50	XLF-63	XLF-80	XLF-100	XLF-160
Indicator		A	•	•	•	•	•	•	•	•
High temp. type	Without heater	H0	•	•	•	•	•	•	•	•
	With heater for 100°C	H2	—	—	•	•	•	•	•	•
	With heater for 120°C	H3	—	•	•	•	•	•	•	•

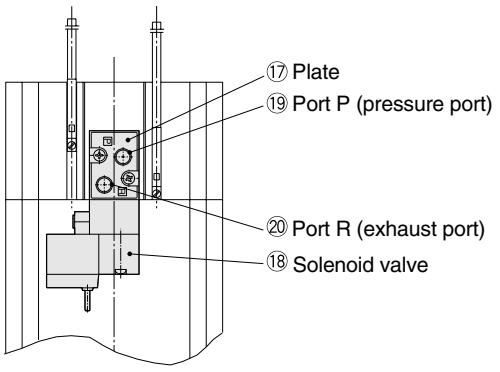
Note) Auto switches cannot be mounted in the case of high temperature types.

Specifications

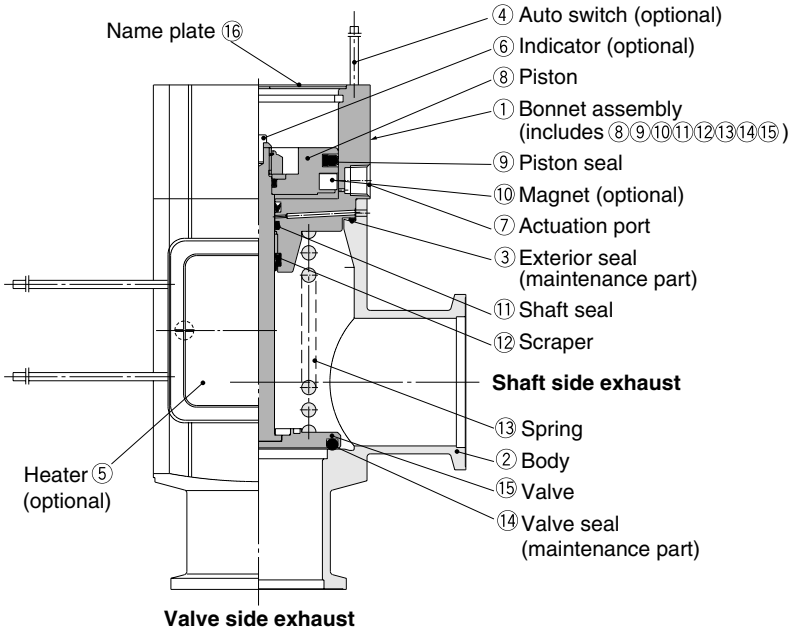
Model		XLF(V)-16	XLF(V)-25	XLF(V)-40	XLF(V)-50	XLF(V)-63	XLF(V)-80	XLF(V)-100	XLF(V)-160
Valve type		Normally closed (Pressurize to open, Spring seal)							
Fluid		Non-corrosive gas for aluminum alloy (A6063) and SUS304/316							
Operating temperature °C	XLF	5 to 60 (High temperature type: 5 to 150)							
	XLFV	5 to 50							
Operating pressure Pa {Torr}		Atmospheric pressure to 1×10^{-5} {760 to 7.5×10^{-8}}							
Conductance ℓ/s Note 1)		5	14	45	80	160	200	300	800
Leakage Pa·m³/s {Torr ℓ/s}	Internal	1.3×10^{-10} {1×10^{-9}} at ordinary temperatures, excluding gas permeation							
	External	1.3×10^{-11} {1×10^{-10}} at ordinary temperatures, excluding gas permeation							
Flange type		KF (NW)					KF (NW), K (DN)		
Principle materials		Body: Aluminum alloy Bellows: Stainless steel Seal: FKM (Fluoro rubber)							
Surface treatment		Exterior: Hard anodized Interior: Bare surface							
Actuation pressure MPa {kgf/cm²}		0.4 to 0.7 {4 to 7}							
Actuation port size	XLF	M5		Rc (PT) 1/8					Rc 1/4
	XLFV	M5 (Ports P, R)				Rc (PT) 1/8 (Port P): M5 (Port 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 same as that of an elbow with the same dimensions.
Note 2) For valve heater specifications, refer to "Common Option Specifications, 1 Heaters" on page 26.

Construction/Operation



With solenoid valve



Valve side exhaust

<<Operating principle>>

By applying pressure from the actuation port ⑦, the piston ⑧, which is sealed by the shaft seal ⑪ and the piston seal ⑨, overcomes the force of the spring ⑬, and the valve ⑮ opens.

With the exhaust of air pressure, the valve ⑮ is closed by the force of the spring ⑬ and is sealed by the valve seal ⑭.

In the case of the XLFV, port P ⑲ is normally pressurized, and the valve ⑮ opens when the solenoid valve ⑱ is turned ON, and closes when it is turned OFF. Operation is the same as that of the XLF.

<<Options>>

For selections, refer to item 3, model number and option symbol table.

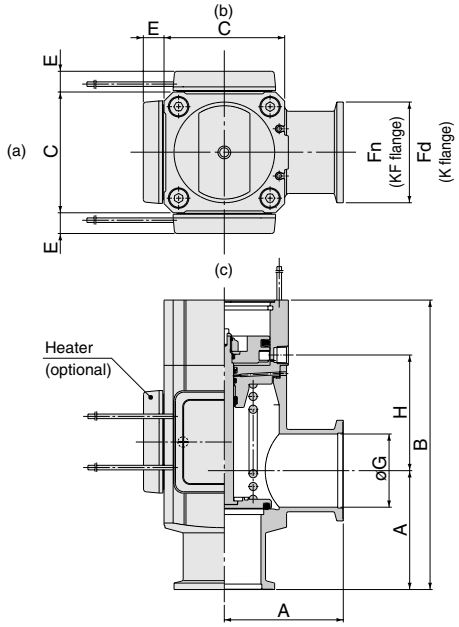
④ Auto switch: The magnet ⑩ actuates the auto switch ④ indicating the position of the integrated valve ⑮ and piston ⑧. With 2 auto switches, the open and closed positions are detected, and with 1 auto switch, either the open or closed position is detected. Auto switches are applicable at ordinary temperatures only (5 to 60°C).

⑤ Heater: Simple heating is performed using thermistors. The valve body can be heated to approximately 80, 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 ① is a heat resistant structure. This is not available with solenoid valve.

⑥ Indicator: When the valve is open, an orange marker about 1 mm in height appears in the center of the name plate ⑯.

Dimensions

XLF/Air operated type

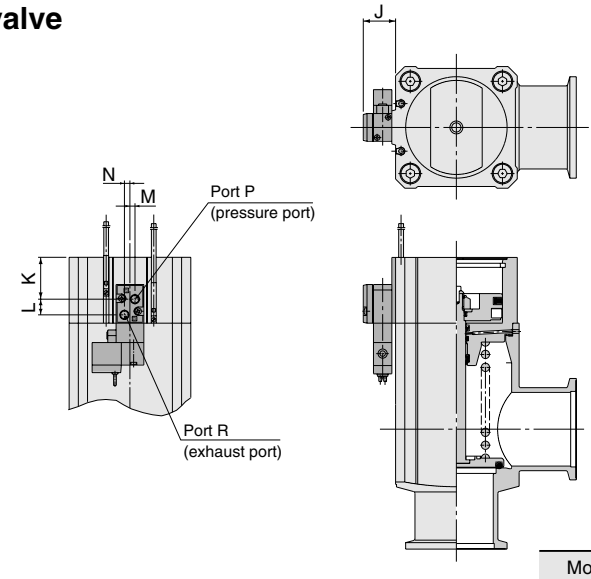


(mm)

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/Part Nos. on page 35.

XLFV/With solenoid valve



(mm)

Model	J	K	L	M	N
XLFV-16	16.5	13	8.5	3	3
XLFV-25	16.5	14	8.5	3	3
XLFV-40	17.5	23	8.5	3	3
XLFV-50	28	23	12	4	2
XLFV-63	29	29	12	4	2
XLFV-80	29	39	12	4	2
XLFV-100	29	50	12	4	2
XLFV-160	29	58	12	4	2

∗ Other dimensions are the same as XLF.

High Vacuum Angle Valve

Series XLG, XLGV

Double Acting/O-ring Seal

Air Operated Type

How to Order

XLG — 16 □ □ □ — M9N □

High vacuum angle valve
(Double acting, O-ring seal, air operated type)

Flange size

16
25
40
50
63
80

Flange type

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

Actuation port direction

Nil	Flange side
K	Left flange surface
L	Rear flange surface
M	Right flange surface

Note) Actuation port direction
(Example) Left flange surface: Indicates that the direction of the actuation port is to the left side when the flange surface is viewed from the front.

Temperature specifications/Heater

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

* Heater options
H2: Not available for XLG16/25.
H3: Not available for XLG16.

Number of switches/Mounting position

Symbol	Quantity	Mounting position
Nil	—	—
A	2 pcs.	Valve open/closed
B	1 pc.	Valve open
C	1 pc.	Valve closed

Type of auto switch

Symbol	Auto switch	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 (Flange size 16 is not available.)
A93 (L)	D-A93 (L)	
M9//	—	Without auto switch (with built-in magnet)

Note 1) Auto switches cannot be mounted in the case of high temperature types (temperature specifications H0).
The standard lead wire length is 0.5 m.
For 3 m, "L" is added at the end of the part number.
(Example) -M9NL

Note 2) The auto switch should be secured against the stopper in the auto switch groove for detection of valve opening, or secured against a stopper or the valve body (depending on the valve size) for detection of valve closing.

XLG

High temperature type combination table

High temperature specifications	Symbol	Model					
		XLG-16	XLG-25	XLG-40	XLG-50	XLG-63	XLG-80
Without heater	H0	•	•	•	•	•	•
With heater for 100°C	H2	—	—	•	•	•	•
With heater for 120°C	H3	—	•	•	•	•	•

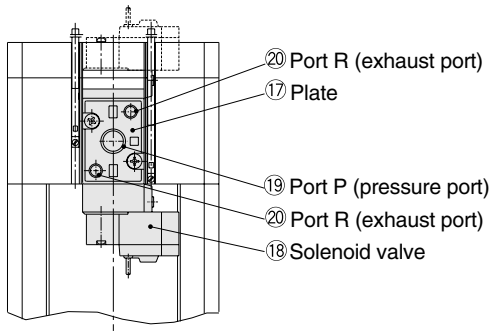
Note) Auto switches cannot be mounted in the case of high temperature types.

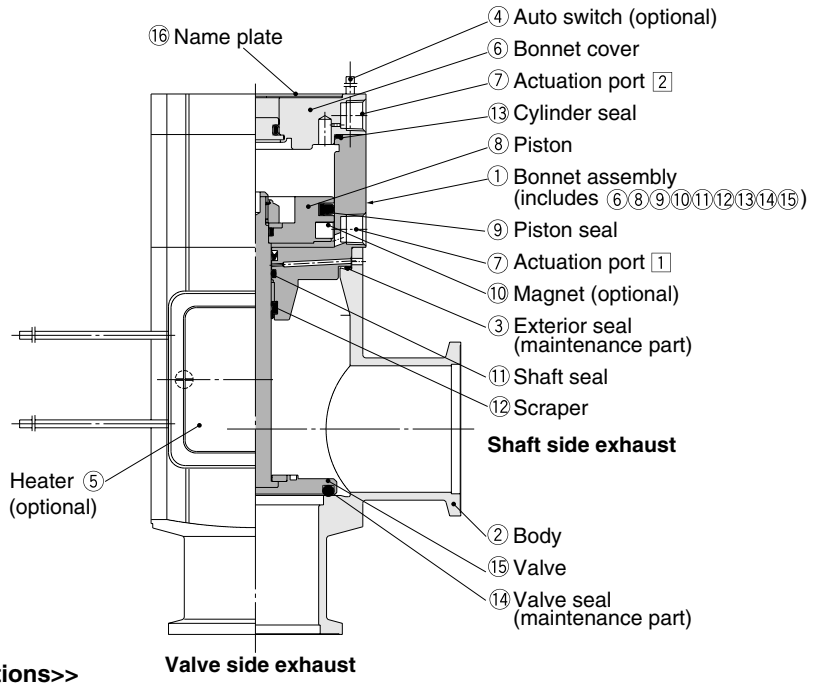
Specifications

Model		XLG(V)-16	XLG(V)-25	XLG(V)-40	XLG(V)-50	XLG(V)-63	XLG(V)-80
Valve type		Double acting (Dual operation), pressurize to open/close					
Fluid		Non-corrosive gas for aluminum alloy (A6063) and SUS304/316					
Operating temperature °C	XLG	5 to 60 (High temperature type: 5 to 150)					
	XLGV	5 to 50					
Operating pressure Pa {Torr}		Atmospheric pressure to 1×10^{-5} {760 to 7.5×10^{-8}}					
Conductance ℓ/s Note 1)		5	14	45	80	160	200
Leakage Pa·m³/s {Torr ℓ/s}	Internal	1.3×10^{-10} {1×10^{-9}} at ordinary temperatures, excluding gas permeation					
	External	1.3×10^{-10} {1×10^{-9}} at ordinary temperatures, excluding gas permeation					
Flange type		KF (NW)				KF (NW), K (DN)	
Principle materials		Body: Aluminum alloy Bellows: Stainless steel Seal: FKM (Fluoro rubber)					
Surface treatment		Exterior: Hard anodized Interior: Bare surface					
Actuation pressure MPa {kgf/cm²}		0.3 to 0.6 {3 to 6}					
Actuation port size	XLG	M5		Rc (PT) 1/8			
	XLGV	M5 (Ports P, R1/R2)			Rc (PT) 1/8 (Port P): M5 (Port R1/R2)		
Weight kg	XLG	0.28	0.46	1.1	1.7	3.1	5.1
	XLGV	0.32	0.5	1.14	1.76	3.16	5.16

Note 1) Conductance is the same as that of an elbow with the same dimensions.
Note 2) For valve heater specifications, refer to "Common Option Specifications, 1 Heaters" on page 26.

Construction/Operation





<<Operating principle>>

By applying pressure from the actuating port 1-⑦, the piston ⑧, sealed by the shaft seal ⑪ and the piston seal ⑨, is operated opening the valve (actuation port 2-⑦ is released). Conversely, by applying pressure to actuation port 2-⑦, the piston ⑧, sealed by the cylinder seal ⑬ and the piston seal ⑨, is operated closing the valve ⑮ which is sealed by the valve seal ⑭ (actuation port 1-⑦ is released). In the case of the XLCV, port P ⑲ is normally pressurized, and the valve ⑮ opens when the solenoid valve ⑱ is turned ON, and closes when it is turned OFF.
Moreover, in the case of a double solenoid, the valve moves to the side where the solenoid valve ⑱ is turned ON.
Operation is the same as that of the XLC.
For sizes 50, 63 and 80, the valve is sealed with a standard load by means of an overrun mechanism.

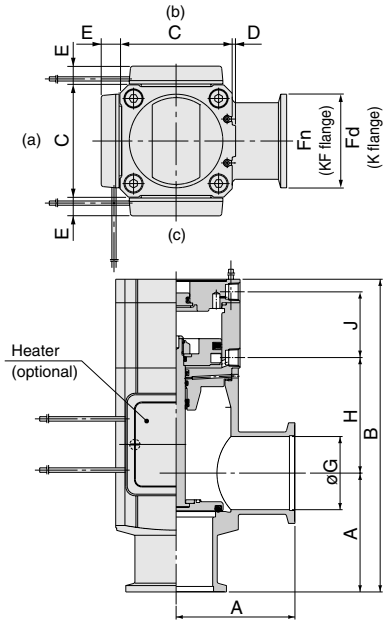
<<Options>>

④ Auto switch: The magnet ⑩ actuates the auto switch ④ indicating the position of the integrated valve ⑮ and piston ⑧. 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).

⑤ Heater: Simple heating is performed using thermistors. The valve body can be heated to approximately 80, 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 ① is a heat resistant structure. This is not available with solenoid valve.

Dimensions

XLG/Air operated type

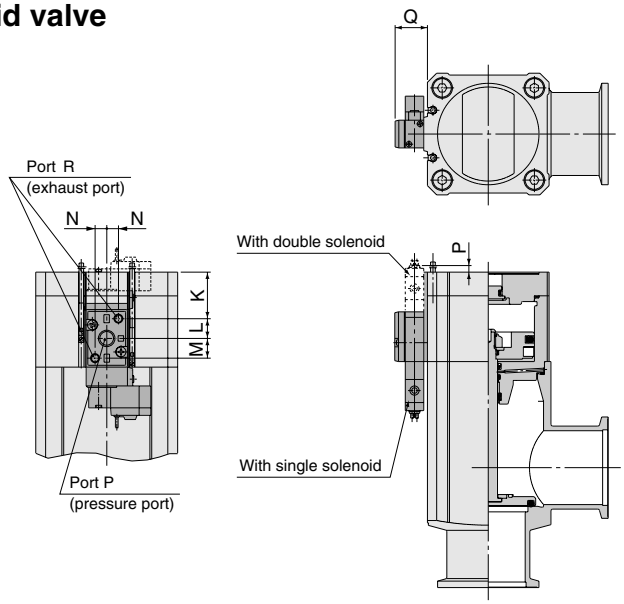


(mm)

Model	A	B	C	D	E Note 1)	Fn	Fd	G	H	J
XLG-16	40	110	38	1	—	30	—	17	**40**	26
XLG-25	50	120	48	1	12	40	—	26	**39**	28
XLG-40	65	171	66	2	11	55	—	41	**63**	36
XLG-50	70	183	79	2	11	75	—	52	**68**	38
XLG-63	**88**	209	100	3	11	87	95	70	**69**	45
XLG-80	90	250	117	3	11	114	110	83	**96**	56

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/Part Nos. on page 35.

XLGV/With solenoid valve



(mm)

Model	K	L	M	N	P	Q
XLGV-16	14	9	6.5	3	17	16.5
XLGV-25	16	9	6.5	3	15	16.5
XLGV-40	29	9	6.5	3	2	17.5
XLGV-50	26	11	11	6.5	6	28
XLGV-63	32	11	11	6.5	—	29
XLGV-80	45	11	11	6.5	—	29

∗ Other dimensions are the same as XLG.

High Vacuum Angle Valve

Series XLD, XLDV

Smooth Exhaust Valve Normally Closed/Bellows, O-ring Seal

Air Operated Type

How to Order

XLD — 25 □ □ □ — M9N □ — □

High vacuum angle valve
Smooth exhaust valve, normally closed, air operated type

Flange size

25
40
50
63
80
100
160

Flange type

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

Actuation port direction

Nil	Flange side
K	Left flange surface
L	Rear flange surface
M	Right flange surface

Note) Actuation port direction
(Example) Left flange surface:
Indicates that the direction of the actuation port is to the left side when the flange surface is viewed from the front.

Temperature specifications/Heater

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

* H2 is not available for XLD-25.

Number of switches/Mounting position

Symbol	Quantity	Mounting position
Nil	—	—
A	2 pcs.	Both sides
B	1 pc.	Valve open
C	1 pc.	Valve closed

Type of auto switch (For exhaust valve)

Symbol	Auto switch	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
A93 (L)	D-A93 (L)	
M9//	—	Without auto switch (with built-in magnet)

Note 1) Auto switches cannot be mounted in the case of high temperature types (temperature specifications H0).
Note 2) The standard lead wire length is 0.5 m.
For 3 m, "L" is added at the end of the part number.
(Example) -M9NL
Note 3) The auto switch should be secured against the stopper in the auto switch groove for detection of valve opening, or secured against a stopper or the valve body for detection of valve closing.

Option
Refer to "Seal material, part number and specification" on page 44.

XLD

High temperature type combination table

High temperature specifications	Symbol	Model						
		XLD-25	XLD-40	XLD-50	XLD-63	XLD-80	XLD-100	XLD-160
Without heater	H0	•	•	•	•	•	•	•
With heater for 100°C	H2	—	•	•	•	•	•	•
With heater for 120°C	H3	•	•	•	•	•	•	•

Note) Auto switches cannot be mounted in the case of high temperature types.

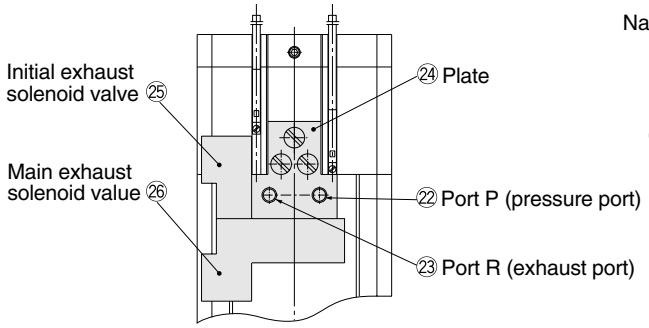
Specifications

Model		XLD(V)-25	XLD(V)-40	XLD(V)-50	XLD(V)-63	XLD(V)-80	XLD(V)-100	XLD(V)-160
Valve type		Normally closed (Spring return & seal) [Both main & initial exhaust valves]						
Fluid		Non-corrosive gas for aluminum alloy (A6063) and SUS304/316						
Operating temperature °C	XLD	5 to 60 (High temperature type: 5 to 150)						
	XLDV	5 to 50						
Operating pressure Pa {Torr}		Atmospheric pressure to 1×10^{-5} {760 to 7.5×10^{-8}}						
Conductance ℓ/s Note 1)	Main exhaust valve	14	45	80	160	200	300	800
	Initial exhaust valve	0.5 to 3	2 to 3	2.5 to 11	4 to 18	4 to 18	6.5 to 31.5	6.5 to 31.5
Leakage Pa·m³/s {Torr ℓ/s}	Internal	1.3×10^{-10} {1×10^{-9}} at ordinary temperatures, excluding gas permeation						
	External	1.3×10^{-11} {1×10^{-10}} at ordinary temperatures, excluding gas permeation						
Flange type		KF (NW)			KF (NW), K (DN)			
Principle materials		Body: Aluminum alloy Bellows: Stainless steel Seal: FKM (Fluoro rubber)						
Surface treatment		Exterior: Hard anodized Interior: Bare surface						
Actuation pressure MPa {kgf/cm²}		0.4 to 0.7 {4 to 7} [Both main & initial exhaust valves]						
Actuation port size	XLD	M5	Rc (PT) 1/8					
	XLDV	M5 (Ports P, R)						
Weight kg	XLD	0.5	1.2	1.8	3.4	5.6	11.5	20
	XLDV	0.57	1.3	1.9	3.5	5.7	11.6	20.1

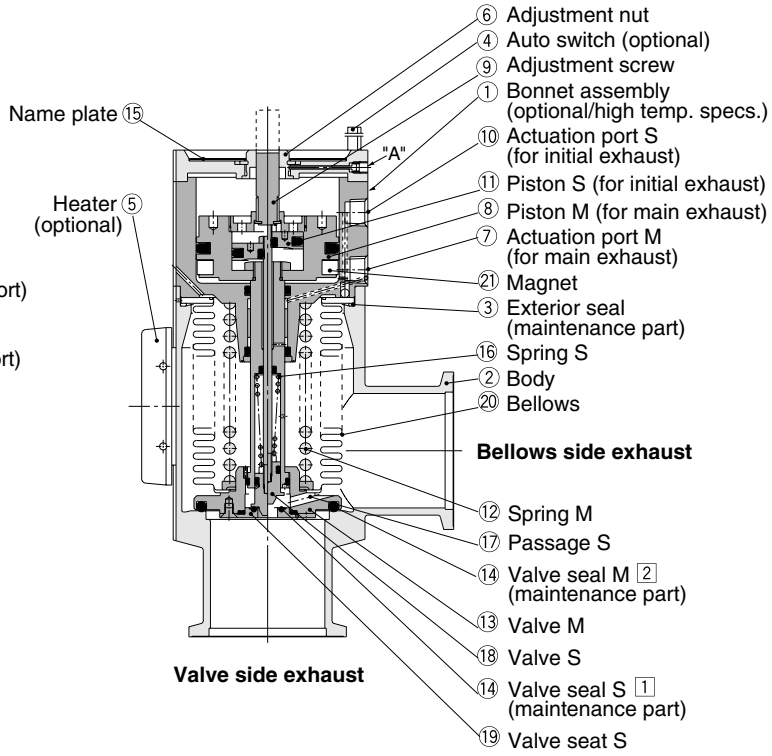
Note 1) The main exhaust conductance is the value for the molecular flow of an elbow having the same dimensions. The initial exhaust valve conductance is the value for the viscous flow.

Note 2) For valve heater specifications, refer to "Common Option Specifications, 1 Heaters" on page 26.

Construction/Operation



With solenoid valve



<<Operating principle>>

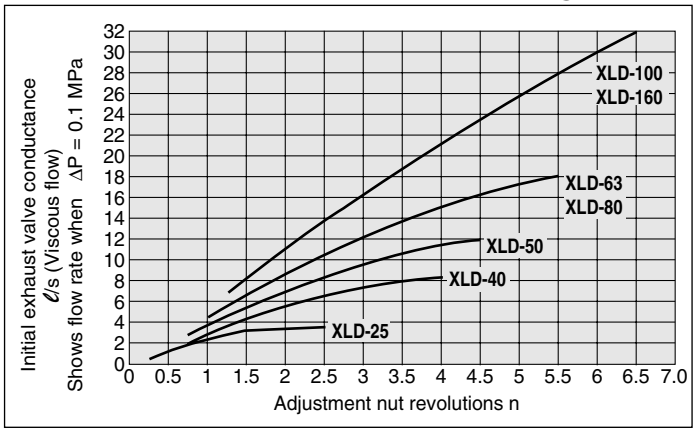
1 **Initial exhaust valve opening adjustment**
The initial exhaust rate should be adjusted before operation (with pilot port S in an unpressurized state).
The initial exhaust rate is set to zero by turning the adjustment nut clockwise until it just stops. (Do not use a tool.)
The initial exhaust rate is adjusted by turning the nut anti-clockwise.
The number of adjustment nut (its pitch is 1mm) rotations and initial exhaust conductance should be confirmed referring to the figure on the right.

2 **Opening of the initial exhaust valve (valve S)**
When pressure is applied to the pilot port S, the valve S is removed from the valve S assembly and opens until the adjusted opening setting.

3 **Opening of the main exhaust valve (valve M)**
When pressure is applied to the pilot port M, the valve M is removed from the body seat surface and fully opens.

4 **Closing of the initial exhaust valve, the main exhaust valve**
By removing the pressure from the pilot ports S and M, both valves return to their sealed position.

Initial exhaust valve conductance setting



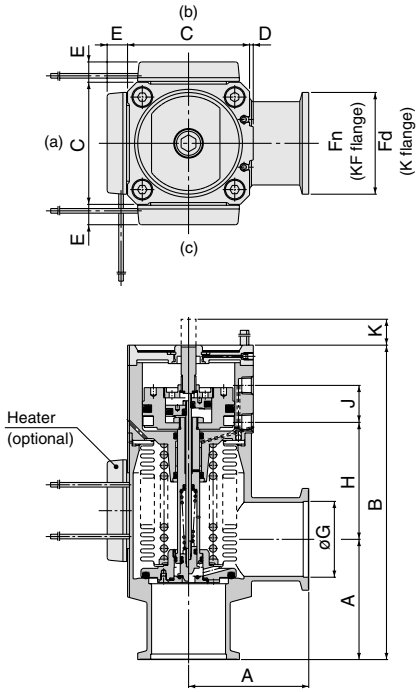
<<Options>>

④ Auto switch: (for main exhaust valve) The magnet ㉑ actuates the auto switch ④ indicating the position of the integrated valve M ⑬ and the piston M ⑧. With two auto switches, the open and closed positions are detected, and with one auto switch, either the open or closed position is detected. Auto switches are applicable at ordinary temperatures only (5 to 60°C).

⑤ 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 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 ① is a heat resistant structure. This is not available with solenoid valve.

Dimensions

XLD/Air operated type



(mm)

Model	A	B	C	D	E	Fn	Fd	G	H	J	K
XLD-25	50	123	48	1	12	40	—	26	41	16	6.5
XLD-40	65	170	66	2	11	55	—	41	63	20	14
XLD-50	70	183	79	2	11	75	—	52	68	20	16.5
XLD-63	88	217	100	3	11	87	95	70	72	20	18.5
XLD-80	90	256	117	3	11	114	110	83	98	20	26.5
XLD-100	108	321	154	3	11	134	138	102	133	20	38.0
XLD-160	138	335	200	3	11	190	180	153	114	30	40.0

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/Part Nos. on page 35.

Common Option Specifications

1 Heaters

Valve heaters are common for models XLA, XLC, XLD, XLF and XLG. Power consumption specifications are shown in the table below.

Item		XL□-25	XL□-40	XL□-50	XL□-63	XL□-80	XL□-100	XL□-160
Rated heater voltage		90 to 125 V AC						
Heater power W (nominal value) In-rush/Normal (Option symbol)	H2 100°C	—	200/40	200/60	400/100	600/150	800/220	1200/350
	H3 120°C	200/30	400/70	400/80	600/130	800/180	1200/300	1600/400

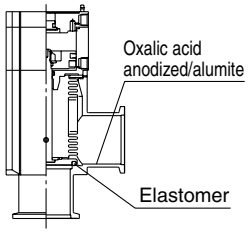
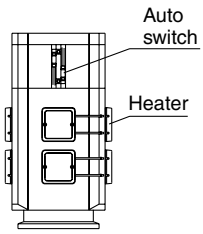
Note) In-rush current will flow to the heater for approximately 30 seconds and will then subside.
Refer to Maintenance Parts on page 43 for further details regarding quantity and type.

2 Auto Switches

Refer to page 55 to 58 for auto switches.

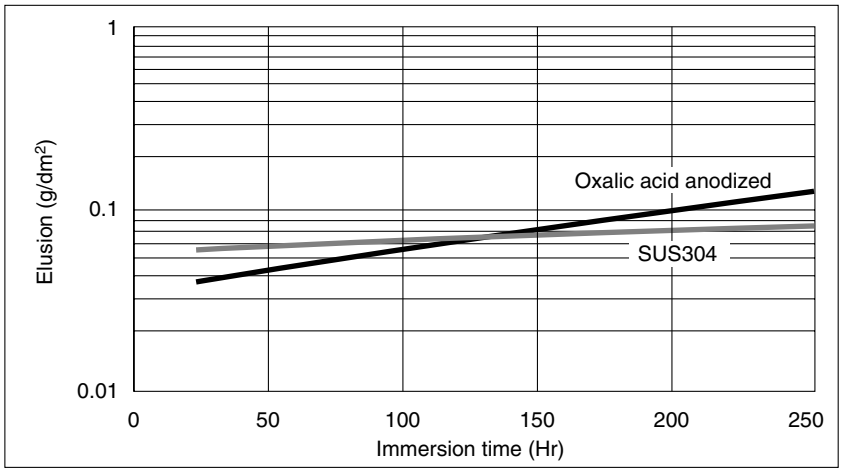
Made to Oder

Special aluminum valve products. Contact SMC for applicable models.

Special specifications	Contents	
Improved corrosion resistance Note)	Body interior is oxalic acid anodized to improve corrosion resistance against chlorine system gas. (The corrosion resistance is equivalent to that of stainless steel SUS304.)	
Improved plasma resistance	Use of perfluoroelastomer for internal seals enables applications in severe operating environments, such as semiconductor manufacturing processes involving plasma generation.	
Improved resistance to corrosion and plasma	Body interior = Oxalic acid anodized Internal seal = Perfluoroelastomer	
Heat-resistant type (120 °C) (Deposit prevention + Operation check + Internal processing)	A baking heater is added for uniform heating to prevent formation of deposits. Adoption of a high temperature auto switch (Max. 150 °C) enables operation check during heating.	

Consult SMC for the above specifications.

Note) Type with improved corrosion resistance.
An immersion test in HCℓ (1% hydrochloric acid) yields results equivalent to those for SUS304 for the first 150 hours.



Maintenance Parts

Air operated angle valve/Manual valve
Bonnet & handle assembly/Construction part number: (1)

Model	Temperature specifications	Valve size					
		XL□□-16	XL□□-25	XL□□-40	XL□□-50	XL□□-63	XL□□-80
XLA	General use	XLA16-30-1	XLA25-30-1	XLA40-30-1	XLA50-30-1	XLA63-30-1	XLA80-30-1
	High temperature	XLA16-30-1H	XLA25-30-1H	XLA40-30-1H	XLA50-30-1H	XLA63-30-1H	XLA80-30-1H
XLAV	General use	XLAV16-30-1	XLAV25-30-1	XLAV40-30-1	XLAV50-30-1	XLAV63-30-1	XLAV80-30-1
XLC	General use	XLC16-30-1	XLC25-30-1	XLC40-30-1	XLC50-30-1	XLC63-30-1	XLC80-30-1
	High temperature	XLC16-30-1H	XLC25-30-1H	XLC40-30-1H	XLC50-30-1H	XLC63-30-1H	XLC80-30-1H
XLCV	General use	XLCV16-30-1	XLCV25-30-1	XLCV40-30-1	XLCV50-30-1	XLCV63-30-1	XLCV80-30-1
XLF	General use	XLF16-30-1	XLF25-30-1	XLF40-30-1	XLF50-30-1	XLF63-30-1	XLF80-30-1
	High temperature	XLF16-30-1H	XLF25-30-1H	XLF40-30-1H	XLF50-30-1H	XLF63-30-1H	XLF80-30-1H
XLFV	General use	XLFV16-30-1	XLFV25-30-1	XLFV40-30-1	XLFV50-30-1	XLFV63-30-1	XLFV80-30-1
XLG	General use	XLG16-30-1	XLG25-30-1	XLG40-30-1	XLG50-30-1	XLG63-30-1	XLG80-30-1
	High temperature	XLG16-30-1H	XLG25-30-1H	XLG40-30-1H	XLG50-30-1H	XLG63-30-1H	XLG80-30-1H
XLGV	General use	XLGV16-30-1	XLGV25-30-1	XLGV40-30-1	XLGV50-30-1	XLGV63-30-1	XLGV80-30-1
XLD	General use	—	XLD25-30-1	XLD40-30-1	XLD50-30-1	XLD63-30-1	XLD80-30-1
	High temperature	—	XLD25-30-1H	XLD40-30-1H	XLD50-30-1H	XLD63-30-1H	XLD80-30-1H
XLDV	General use	—	XLDV25-30-1	XLDV40-30-1	XLDV50-30-1	XLDV63-30-1	XLDV80-30-1
XLH	Standard	XLH16-30-1	XLH25-30-1	XLH40-30-1	XLH50-30-1	—	—

Exterior seal, (M) Valve seal, S Valve seal Assemblies

Construction No.	Description	XL(A, C, H) [V]-16	XL(F, G) [V]-16	XLD [V]-25	XL(A, C, H) [V]-25	XL(F, G) [V]-25	XLD [V]-40	XL□ [V]-40	XLD [V]-50	XL□ [V]-50	XLD [V]-63	XL□ [V]-63	XLD [V]-80	XL□ [V]-80
③	Exterior seal	AS568 -025V	XLF16-6	AS568-030V		XLF25-6	AS568-035V		AS568-039V		AS568-043V		AS568-045V	
⑭ (-2)	(M) Valve seal	B2401-V15V		B2401-V24V			B2401-P42V		AS568-227V		AS568-233V		B2401-V85V	
⑭ (-2)	S Valve seal assembly	—		AS568 -009V	—		XLD40 -2-9-1A	—	XLD50 -2-9-1A	—	XLD80 -2-9-3A	—	XLD80 -2-9-3A	—

∗ Refer to the Construction/Operation drawing of each series for the construction numbers.

Replacement heaters/Part Nos. (XLA, XLC, XLD, XLF, XLG, XLH)

Model	Part Nos./Mounting positions/Set quantity					
	H2 (heater for 100°C)	Mounting position	Set quantity	H3 (heater for 120°C)	Mounting position	Set quantity
XL□-25	—	—	—	XLA25-60M-1	(a)	1
XL□-40	XLA25-60M-1	(a)	1	XLA25-60M-2	(b) (c)	1
XL□-50	XLA25-60M-1	(a)	1	XLA25-60M-2	(b) (c)	1
XL□-63	XLA25-60M-2	(b) (c)	1	XLA25-60M-3	(a) (b) (c)	1
XL□-80	XLA25-60M-3	(a) (b) (c)	1	XLA25-60M-2	(b) (c)	2

Note 1) The above (a), (b), (c) indicate heater mounting positions. The heater mounting positions (a), (b), (c) are shown in the dimension drawing for each series.
Note 2) Heater set quantity indicates multiple heaters.
(Example) The heaters included with XLA-80-H3 are 2 pieces of XLH25-60M-2 (a set including 2 heater units).

Angle solenoid valve

Construction No.	Description	XLS-16-□□	XLS-16-P□□	XLS-25-□□	XLS-25-P□□
②	Coil assembly	XLS16-20-※G, C, T, D	XLS16-20-P※G	XLS25-20-※G, C, T, D	XLS25-20-P※G
⑥	Core assembly	XLS16-30-1		XLS25-30-1	
④	Armature assembly	XLS16-30-2		XLS25-30-2	
③-1	Core O-ring	AS568-018V		AS568-018V	
③-2	Bonnet O-ring	AS568-025V		AS568-030V	

Note) The voltage symbol is entered here. (Refer to "How to Order")
The letters G, C, T and D following ※ indicate grommet, conduit, terminal and DIN respectively.
∗ Refer to the Construction/Operation sections for construction numbers.

Stainless Steel
High Vacuum Angle/In-line Valve
Series XMA, XYA
Normally Closed/Bellows Seal

How to Order

Angle type XMA – 16 □ □ □ – M9N A – □

In-line type XYA – 25 □ □ □ – M9N A – □

1 2 3 4 5 6 7

1. Flange size

Size	XMA	XYA
16	●	—
25	●	●
40	●	●
50	●	●
63	●	●
80	●	●

2. Flange type

XMA

Symbol	Type	Applicable flange size
Nil	KF (NW)	16, 25, 40, 50, 63, 80
D	K (DN)	63, 80
C	CF	16 (034), 40 (070), 63 (114)

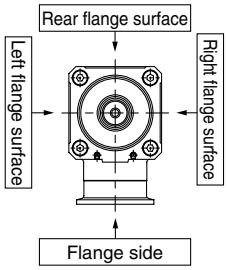
XYA

Nil	KF (NW)	25, 40, 50, 63, 80
D	K (DN)	63, 80

3. Indicator/Pilot port direction

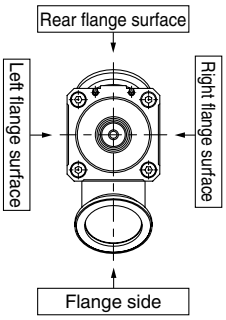
XMA

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



XYA

Symbol	Indicator	Pilot port direction
Nil	Without indicator	Rear flange side
A	With indicator	Rear flange side
F		Left flange surface
J		Right flange surface
K	Without indicator	Left flange surface
M		Right flange surface



4. Temperature specifications

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

5. Auto switch type

Symbol	Auto switch	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 (Flange size 16 is not available.)
A93 (L)	D-A93 (L)	
M9//	—	Without auto switch (with built-in magnet)

Auto switches cannot be mounted in the case of high temperature types (temperature specifications H0).
The standard lead wire length is 0.5 m. For 3 m, "L" is added at the end of the part number.
Ex.) -M9N**L**

6. No. of auto switches/Detecting position

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

7. Seal material, part number and specification

· 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.

· Part nos. for seal material replacement and leakage specification

Symbol	Replacement part Note 2)	Leakage Pa·m³/s or less Note 1)	
		Internal (2) Note 2)	External (3) Note 2)
Nil	—	1.3×10^{-10} (FKM)	1.3×10^{-11} (FKM)
A	**2, 3**	1.3×10^{-8}	1.3×10^{-9}
B	**2**	1.3×10^{-8}	1.3×10^{-11} (FKM)
C	**3**	1.3×10^{-10} (FKM)	1.3×10^{-9}

Note 1) Values at ambient temperatures, excluding gas permeation.
Note 2) Refer to parts number of "Construction" on the page 39 for changed part. Number indicates parts number of "Construction" accordingly.

To order something else "Nil" (standard), list the symbols starting with "X", followed by each symbol for "seal material" and then "changed parts" at last.

Ex.) XMA-16-M9NA-XN1A

SMC

Stainless Steel
High Vacuum Angle/In-line Valve

Series XMD, XYD

2 Stage Control, Single Acting/Bellows, O-ring Seal

PAT.

How to Order

Angle type XMD — 25 □ □ □ — M9N A — □

In-line type XYD — 25 □ □ □ — M9N A — □

1 2 3 4 5 6 7

1. Flange size

Size	XMD	XYD
25	●	●
40	●	●
50	●	●
63	●	●
80	●	●

2. Flange type

XMD

Symbol	Type	Applicable flange size
Nil	KF (NW)	25, 40, 50, 63, 80
D	K (DN)	63, 80
C	CF	40 (070), 63 (114)

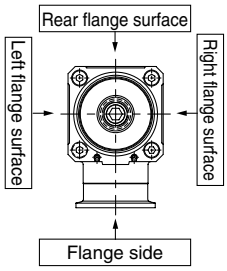
XYD

Nil	KF (NW)	25, 40, 50, 63, 80
D	K (DN)	63, 80

3. Pilot port direction

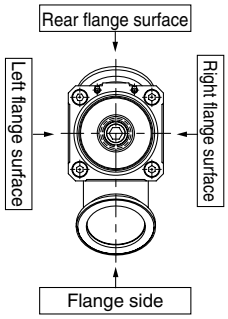
XMD

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



XYD

Symbol	Pilot port direction
Nil	Rear flange surface
K	Left flange surface
M	Right flange surface



4. Temperature specifications

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

5. Auto switch type

Symbol	Auto switch	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
A93 (L)	D-A93 (L)	
M9//	—	Without auto switch (with built-in magnet)

Auto switches cannot be mounted in the case of high temperature types (temperature specifications H0).
The standard lead wire length is 0.5 m. For 3 m, "L" is added at the end of the part number.
Ex.) -M9N<u>L</u>

6. No. of auto switches/Detecting position

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

7. Seal material, part number and specification

· 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

The material used in the sliding part of the S-valve is: FKM *: Produced by Mitsubishi Cable Industries, Ltd.

· Part nos. for seal material replacement and leakage specification

Symbol	Replacement part Note 2)	Leakage Pa·m³/s or less Note 1)	
		Internal (2) (4) (5) Note 2)	External (3) Note 2)
Nil	—	1.3×10^{-10} (FKM)	1.3×10^{-11} (FKM)
A	**2**, **3**, **4**, **5**	1.3×10^{-8}	1.3×10^{-9}
B	**2**, **4**, **5**	1.3×10^{-8}	1.3×10^{-11} (FKM)
C	**3**	1.3×10^{-10} (FKM)	1.3×10^{-9}

Note 1) Values at ambient temperatures, excluding gas permeation.
Note 2) Refer to parts number of "Construction" on the page 46 for changed part. Number indicates parts number of "Construction" accordingly.

To order something else "Nil" (standard), list the symbols starting with "X", followed by each symbol for "seal material" and then "changed parts" at last.

Ex.) XMD-25-M9NA-XN1A