XL*****-OME0004

High Vacuum L Type Valve
(O-ring Seal)

Operation Manual

XLG

Thank you for purchasing SMC product.
For appropriate operation of this product, please read this operation manual thoroughly to understand. Also, refer to the drawing, catalogue or product information for structure and specification of this product. Confirm operating environment is within specifications. Keep this operation manual with care so that it can be used at any time.

Contents of this operation manual is subject to change without notice.

SMC CORPORATION

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1.SPECIFICATIONS

Model		XLG(V)－16	XLG(V)－25	XLG(V)－40	XLG(V)－50	XLG(V)－63	XLG(V)－80	XLG(V)－100	XLG(V)－160
Valve type		Double acting(dual operation),pressure to open/close							
Fluid		Non-corrosive gas for aluminum alloy(A6063)and SUS304／316							
Operating temperature ℃	XLG	5 to 60(high temperature type:5 to 150)							
	XLGV	5 to 50							
Operating pressure Pa		Atmospheric pressure to 1×10^{-5}							
Note1) Conductance l／s		5	14	45	80	160	200	300	800
Leakage Pa m^3／s	Internal	1.3×10^{-10} at ordinary temperatures,excluding gas permeation							
	External	1.3×10^{-10} at ordinary temperatures,excluding gas permeation							
Note2) Operating time ms	XLG	40	45	60	60	95	105		
	XLGV	45	50	85	90	130	150		
Flange type		KF				KF・K			
Principle materials		Body:Aluminum alloy Bellows:Stainless steel Seal:FKM(fluoro rubber)							
Surface treatment		Exterior:Hard anodized Interior:Machined for clean environment							
Actuation pressure MPa		0.3 to 0.6							
Actuation port size	XLG	M5		Rc1／8					Rc1／4
	XLGV	M5(Ports P,R_1／R_2)			Rc1／8(Ports P), M5(Ports R_1／R_2)				
Actuating solenoid valve recommended Cv factor(XLG)		0.06≦	0.09≦	0.11≦	0.15≦	0.4≦	0.5≦		
Service life (Million cycles)		3			2				
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)The operating time with no solenoid valve (XLG) is the same value as the case of the solenoid valve piped directly to the bonnet,where the actuation pressure is 0.5 MPa. The operating time becomes faster under high pressure.

2. How to order

XLG - 16 □ □ □ - F9N □

High vacuum angle valve
(Double acting, 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	16·25·40·50·63·80·100·160
D	K	63·80·100·160

Actuation port direction

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

Switch quantity/Mounting position

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

Auto switch type

Nil	Without auto switch (without built-in magnet)	
F9N(L)	D-F9N(L)	Solid state switches
F9P(L)	D-F9P(L)	
F9B(L)	D-F9B(L)	
A90(L)	D-A90(L)	Reed auto switches
A93(L)	D-A93(L)	

Temperature specifications/Heater

Symbol		Temp. range	Heater
Nil		5 to 60℃	None
High temp. type	H0	5 to 150℃	None
	H1		With heater for 80℃
	H2		With heater for 100℃
	H3		With heater for 120℃

(Note) The combination of "with heater (H1, H2 and H3)" and "with auto-switch" is impossible.

XLGV - 16 □ K - F9N □ - 1 □ G □

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

Flange size

16	25	40	50	63	80	100	160

Flange type

Symbol	Type	Applicable flange size
Nil	KF	16·25·40·50·63·80·100·160
D	K	63·80·100·160

Solenoid valve direction

K	Left flange surface
L	Rear flange surface
M	Right flange surface

Auto switch type

Nil	Without auto switch (without built-in magnet)	
F9N(L)	D-F9N(L)	Solid state switches
F9P(L)	D-F9P(L)	
F9B(L)	D-F9B(L)	
A90(L)	D-A90(L)	Reed auto switches
A93(L)	D-A93(L)	

Switch quantity/Mounting position

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

Rated voltage

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

Solenoid valve action

Nil	2 position single
W	2 position double

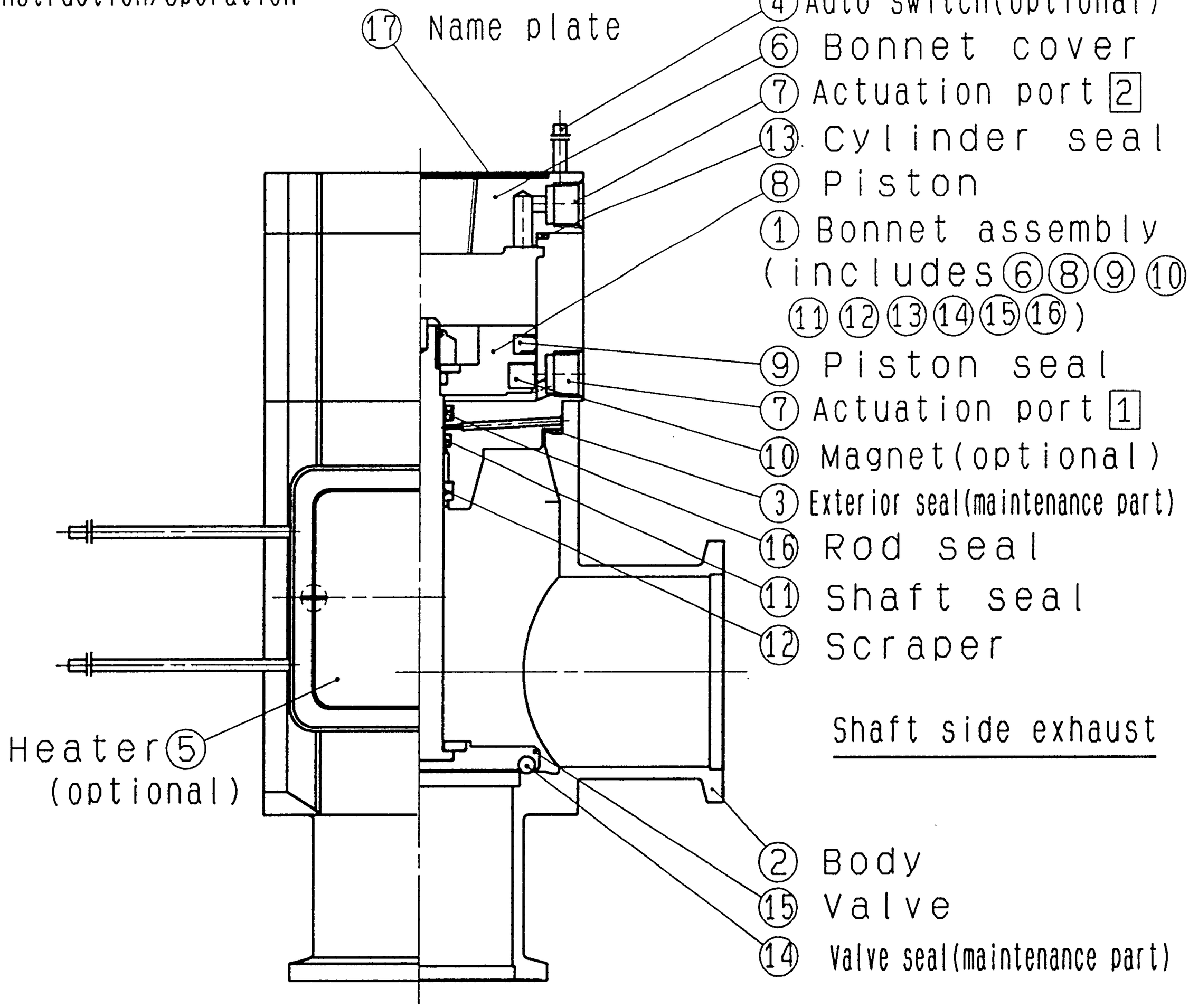
Electrical entry

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

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)

3. Construction/Operation

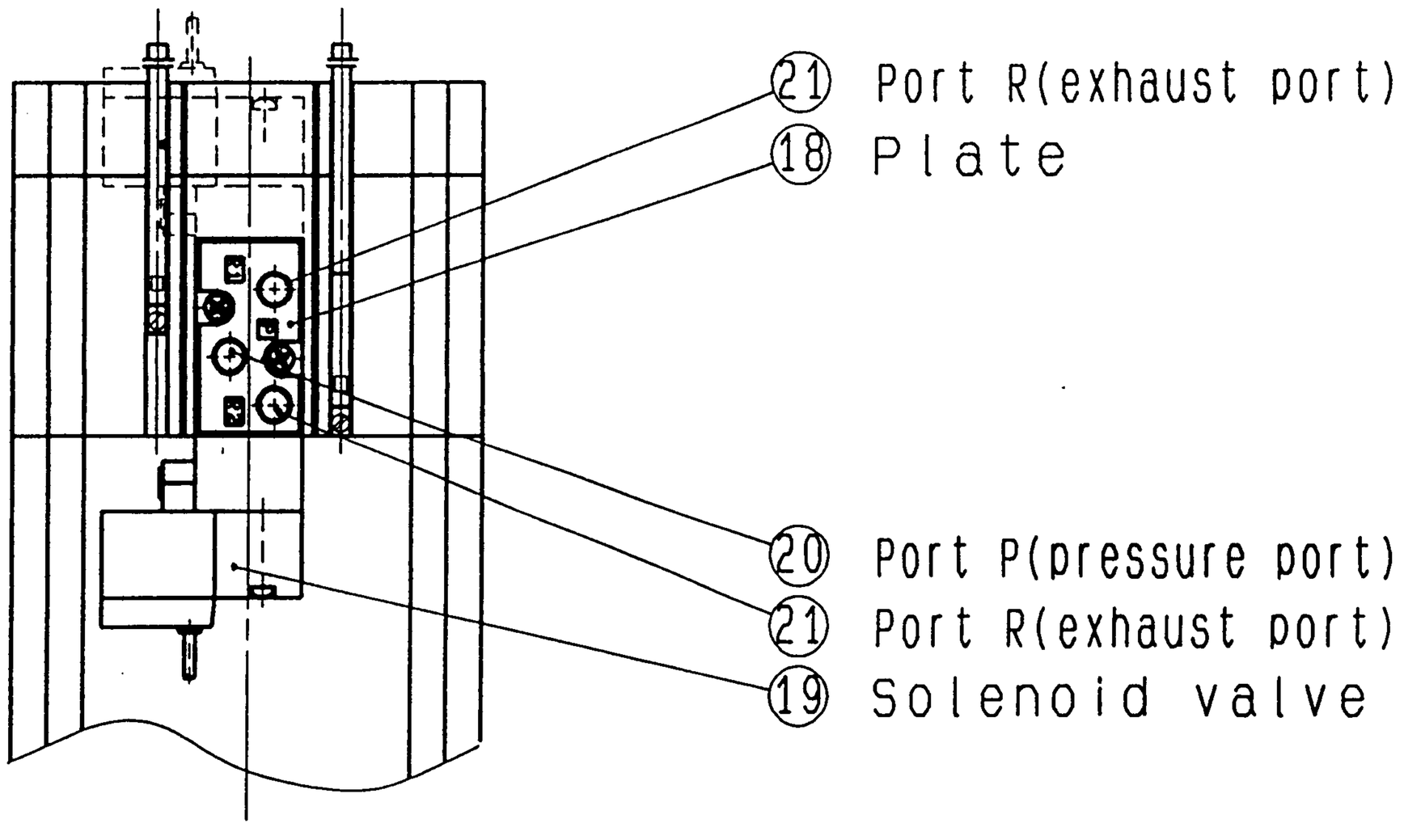


XLG

Shaft side exhaust

XLG

Valve side exhaust



XLGV

《Operating principle》

[X L G]

By applying pressure from the actuating port [1]−⑦, the piston ⑧, sealed by the rod seal ⑯ 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) .

[X L G V ; With solenoid valve]

Port P ⑳ is normally pressurized, and the valve ⑮ opens when the solenoid valve ⑲ 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 ⑲ is turned ON.

<Options>

④Auto 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 temperature only (5 to 60℃) .

⑤Heater ; Simple heating is performed using thermistors. The valve body can be heated to approximately 80,100 or 120℃, 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.

4. Safety Instructions

Be sure to confirm the specifications and read the following precautions before handing these valves.

4－1 Vacuum piping

①Before mounting, clean the surface of the flange seal and the O-ring with ethanol, etc.

②Be sure that the flange O-ring is compressed by 15% or more.

③In high humidity environment, keep packaged condition just before piping.

④Seal part on flange is protected, but for safety reason, handle not to damage the seal part.

⑤Do not damage solenoid valve during clamping.

4－2 Operational atmosphere piping

①Select materials for the actuation pressure piping, and heat resistance for fittings that are suitable for the applicable operating temperature.

②When controlling valve responsiveness, take note of the size and length of piping, as well as the Cv factor of the actuating solenoid valve. (Refer to item 2.)。

③Actuating pressure should be kept within the specified range.

0.4～0.5 MPa is recommended.

④In case of with solenoid valve (XLGV) , do not give excessive force to the solenoid valve.

4－3 Pressure and fluid

①Use within operating pressure range. It is impossible to pressurize from valve side.

②Material of body is A6063, main part is such as SUS304, vacuum sealant is fluoro rubber (Viton). Use fluid which gives no effect to above material.

③For deposit of fluid, protect by heating or check periodically to remove the fluid or replace part.

4－4 Heating

①For models with a solenoid valve (XLGV) ,the temperature of the solenoid valve section should be no greater than 50℃.

②Heat only body part and make bonnet part well ventilated.

③In case of with heater(thermistor), insulate heat insulate material from lead wire and wire bound part enough. Setting temperature is for condition without wind and heat insulate material and changed depending on requirement. And apply temperature of 150℃ or more to wire bound part. (Use F class insulation as material of wire bound.)

④Before operation, check insulation resistance at actual operating temperature.

⑤Thermistor has self temperature control function, but if abnormal increase of temperature due to heat of reaction of fluid is estimated, setting temperature fuse is recommend.

4－5 Switch

①The switch section should be kept at a temperature no greater than 60℃.

②Make wire of switch have enough curvature and do not give excessive force to it.

4 – 6 Maintenance

①Replace the bonnet assembly when the end of its service life is approached.

②If damage is suspected prior to the end of the service life, perform early maintenance.

③When operating at high temperatures, the compression set of the O-ring becomes larger, and a danger of external leakage arises. Confirm that clamps are tightened, etc.

5. Maintenance and replacement of part

5 – 1 Maintenance

It is possible to maintain without removing piping. And also possible to replace such as bonnet assembly by disconnecting hexagon socket head bolt (4 pcs) on the top of bonnet assembly.

When removing valve or exterior seals, take care not to damage the sealing surfaces.

When installing the valve seal, be sure that the O-ring is not twisted.

5 – 2 Replacement of part

For replacement of part, refer to following table. (Refer to item 3 construction drawing.)

5 – 2 – 1 Internal part

Model	Bonnet assembly ①			Exterior seal ③	Valve seal ⑭	Auto switch ④
	General use	With solenoid valve	High temperature			
XLG–16	XLG16–30–1	XLGV16–30–1	XLG16–30–1H	XLG16–6	B2401–V15V	D–F9N(L) D–F9P(L) D–F9B(L) D–A90(L) D–A93(L)
XLG–25	XLG25–30–1	XLGV25–30–1	XLG25–30–1H	XLG25–6	B2401–V24V	
XLG–40	XLG40–30–1	XLGV40–30–1	XLG40–30–1H	AS568–035V	B2401–P42V	
XLG–50	XLG50–30–1	XLGV50–30–1	XLG50–30–1H	AS568–039V	AS568–227V	
XLG–63	XLG63–30–1	XLGV63–30–1	XLG63–30–1H	AS568–043V	AS568–233V	
XLG–80	XLG80–30–1	XLGV80–30–1	XLG80–30–1H	AS568–045V	B2401–V85V	
XLG–10C	XLG100–30–1	XLGV100–30–1	XLG100–30–1H	AS568–050V	AS568–349V	
XLG–16C	XLG160–30–1	XLGV160–30–1	XLG160–30–1H	AS568–167V	G 155V	

5 – 2 – 2 Heater ⑤

Model	Option No.(Referential setting temperature)・Heater set quantitiy					
	H1(80℃)	Set quantity	H2(100℃)	Set quantity	H3(120℃)	Set quantity
XLG–25	XLA25–60B–1	1	—	—	XLA25–60M–1	1
XLG–40	XLA25–60B–1	1	XLA25–60M–1	1	XLA25–60M–2	1
XLG–50	XLA25–60B–2	1	XLA25–60M–1	1	XLA25–60M–2	1
XLG–63	XLA25–60B–2	1	XLA25–60M–2	1	XLA25–60M–3	1
XLG–80	XLA25–60B–3	1	XLA25–60M–3	1	XLA25–60M–2	2
XLG–100					XLA25–60M–2	3
XLG–160					XLA25–60M–2	4

note: Heater set quantity indicates multiple heaters.

(Example) The heaters included with XLA–80–H3 are 2 pieces of XLA25–60M–2 (a set including 2 heater units).