Hygienic

DA Type Diaphragm Valves

5

High reliable products derived from advanced technologies

► Features of DA-type diaphragm valves

- Two types of DA cylinders are available: ADC (aluminum die cast) type with lightweight and SUS304 type with excellent corrosion resistance. Both types are designed compact.
- The stem part is out of wetted area, and this structure is suitable for using in aseptic conditions.
- The seat part and diaphragm part are designed separately, enabling to keep the sealing force for a long time.
- The structure of minimized dead space to enhance the CIP effect and to prevent contamination can also be used for aseptic lines in food industry.
- All inner surfaces of the body are machined and are structured in a geometric form which can prevent remaining liquid.
- Upright mounting allows piping installation without liquid remaining.
- For the diaphragm seat installation method, the metal touch structure of body parts enables assembly in stable conditions.
- Three-way nozzle type (T type) and different diameter types are available, and these valves can be used in piping for various purposes.
- Flow switching valves with excellent aseptic characteristics are available.

*1 The external surface of the ADC cylinder has an acrylic urethane coating (pale gray color).
For 2.5S to 3S of DAC3 type and DM type, only SUS cylinder is available.

Material

Body	SUS-316L
Other main exterior parts	SUS-304
Cylinder	ADC12 / SUS-304

Production standard

Surface finish	Body internal : #320 to #400 buff polishing Body external : #320 buff polishing Other : Beads shot blasting
Dimensional tolerance	Face to face dimension : ±1.5 Angular tolerance : 0.5°
Main body max pressure	1 Mpa (fluid pressure, normal temperature)
Valve seat max pressure	0.6MPa (fluid pressure, normal temperature)
Usable temperature (fluid temperature)	0~135℃
Operating air pressure	Automatic normally closed: 0.4 to 0.7MPa Automatic normally open: 0.4 to 0.5MPa Automatic double-action: 0.3 to 0.4MPa
Operating air connection hole size	Rc1/8
Main body type	L type, T type
Main body size	· 8A to 3S · Combination with different diameter

* When welding the tank spud, use extra caution to prevent it from being deformed due to heat.
(If the tank spud is distorted, the sealing of the tank cannot be maintained, which may result in liquid leakage and corrosion.)

► Valve selection and ordering

Please use appropriate valve according to each valve specifications.
When using exceeds the range of specifications, high safety design is required. We would be pleased to provide consultation if you have any request.

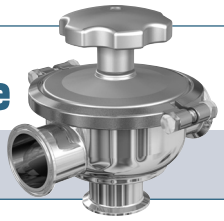
► Ordering

○ If there is any request of surface finish, please specify both internal and external surface.

○ For further details, refer to the DA type diaphragm valve details on Page 10.

DA type diaphragm valve (ON/OFF valve)

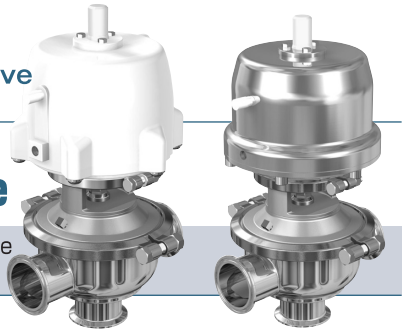
DAS2type



- Manual diaphragm valve
- Bottom-up type

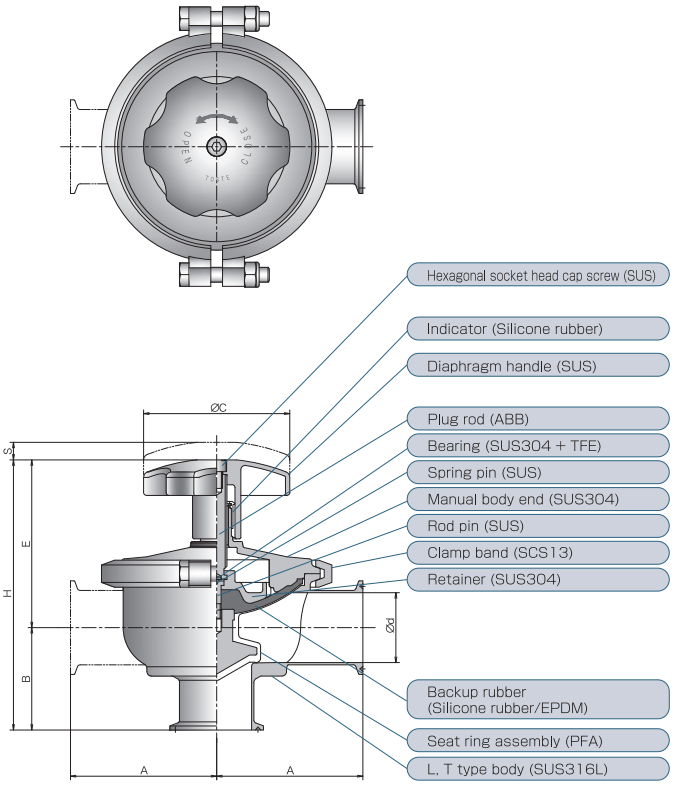
DA type diaphragm valve (ON/OFF valve)

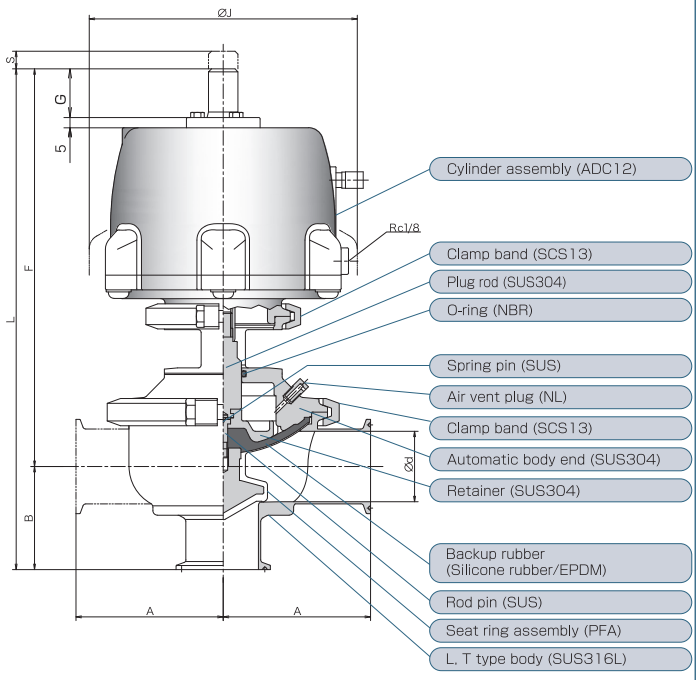
DAC2type



- Automatic diaphragm valve
- Bottom-up type

● ADC cylinder type ● SUS cylinder type





Dimension (mm)

SIZE	φd	A	B	φC	E	H	φJ		F	G	L	S
							ADC	SUS				
8A	10.5	70	37	70	79	116	135	122	180	25	217	5
10A	14.0	70	40	70	80	120	135	122	182	25	222	5
15A	18.4	70	40	70	82	122	135	122	184	25	224	5
1S	23.0	70	50	70	85	135	135	122	187	25	237	6
1 1/2S	35.7	85	60	100	104	164	135	122	198	25	258	9
2S	47.8	100	70	100	115	185	182	167	270	33	340	12
2 1/2S	59.5	105	105	100	120	225	182	167	276	33	381	14
3S	72.3	110	110	100	126	236	182	167	282	33	392	16

Weight (kg)

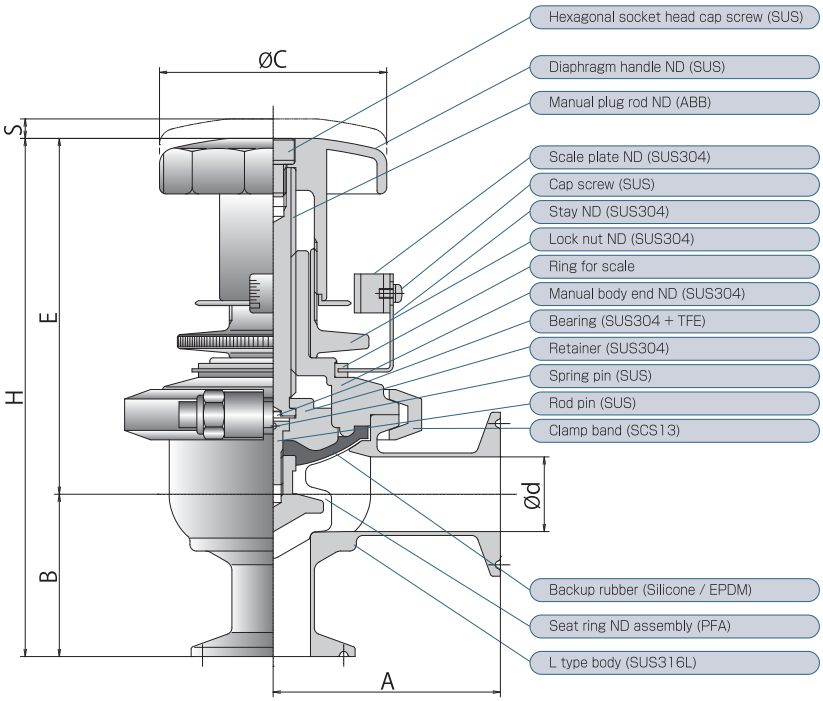
Manual	Automatic	
	ADC	SUS
1.5	3.5	4.7
1.5	3.5	4.7
1.5	3.5	4.7
1.6	3.6	4.8
2.7	4.7	5.9
4.4	10.2	13.1
5.2	11.0	13.9
6.0	11.7	14.6

Diaphragm type needle control valve

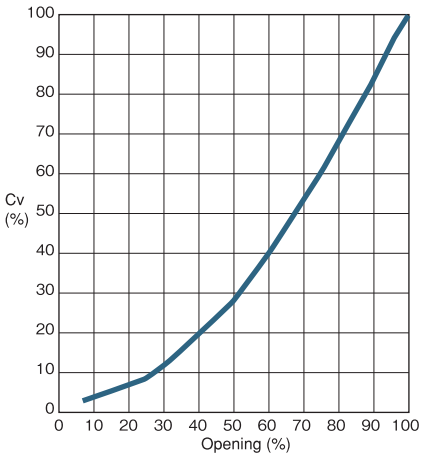
DAN2type

- Manual Diaphragm valve
- Bottom-up type

- Integrated design of diaphragm seat with excellent aseptic characteristics is suitable for cleaning and sterilization.
- The needle structure during the small opening and the normal structure during the large opening enable a wide range of flow control.
- Automatic positioner, 2 position type and 3 position type are available.



● Flow characteristics



● Cv value of each size

Size	Minimum control Cv	Full opening Cv
8A	0.3	3.7
10A	0.4	6.3
15A	0.5	8.7
1S	0.6	11.5
1 1/2S	0.7	31.0
2S	0.8	57.0
2 1/2S	1.0	82.0
3S	1.4	108.0

Dimension (mm)

SIZE	φd	A	B	φC	E	H	S
8A	10.5	70	37	70	103.3	140.3	6
10A	14.0	70	40	70	105.1	145.1	6
15A	18.4	70	40	70	107.3	147.3	6
1S	23.0	70	50	70	109.6	159.6	6
1 1/2S	35.7	85	60	100	133.9	193.9	10
2S	47.8	100	70	100	151.5	221.5	15
2 1/2S	59.5	105	105	100	157.4	262.4	15
3S	72.3	110	110	100	163.8	273.8	15

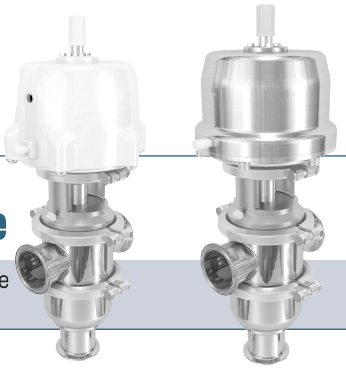
DM type diaphragm type

DMS2type

- DM type manual diaphragm valve
- Top-down type

DM type diaphragm type

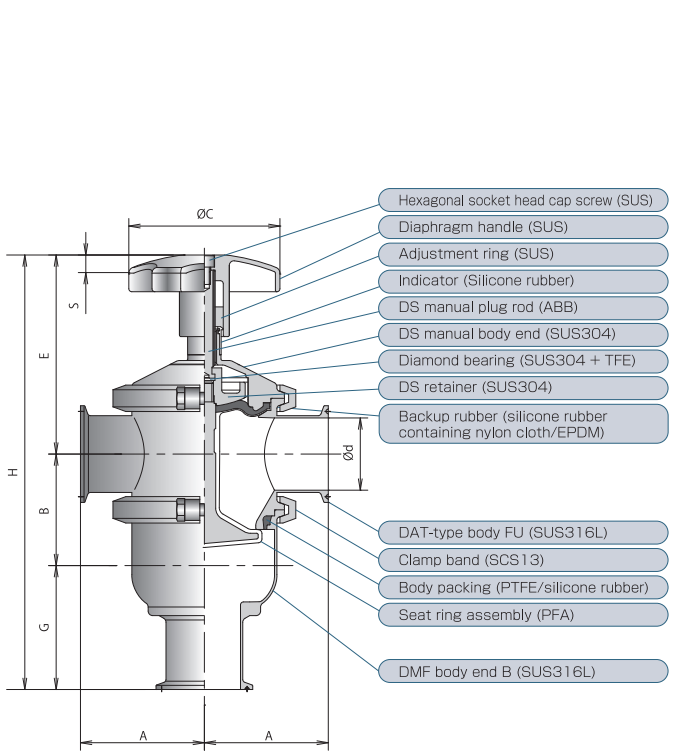
DMC2type

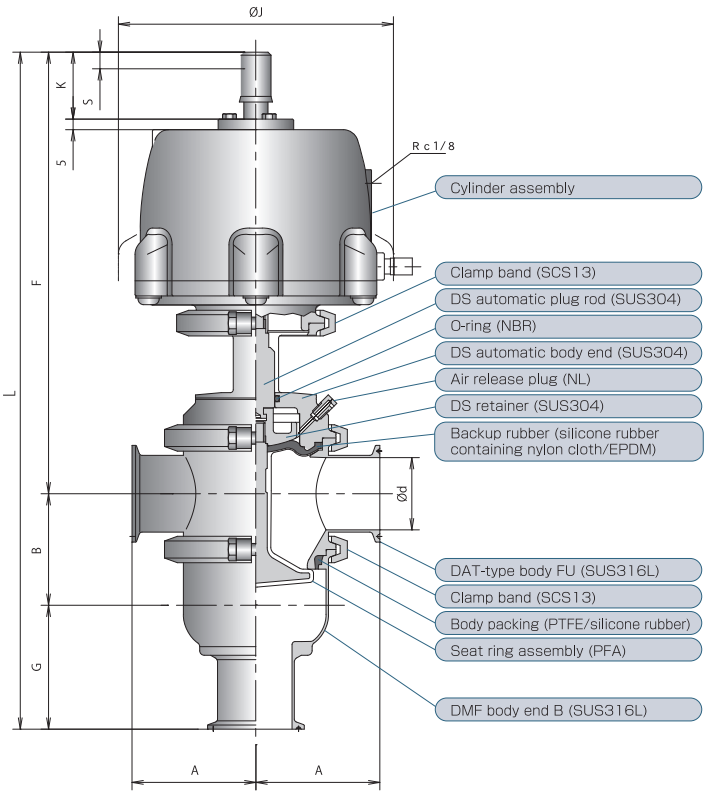


- DM type automatic diaphragm valve
- Top-down type

● ADC cylinder type ● SUS cylinder type

- Integrated design of diaphragm seat and valve plug can be possible to switch the flow line with excellent aseptic characteristics.
- Installing in upright, inverted and horizontal positions (nozzle direction is limited) is possible, which prevents liquid accumulation and minimizes dead space to enable high afficent CIP.
- The gasket material for wetted part is made of fluorocarbon resin (PFA), which not only has excellent chemical resistance but also has no influence on product liquid.
- For the manual valve, when the liquid temperature changes, additional tightening is needed.





Dimension table (mm)

SIZE	φd	A	G	B	φC	E	H	φJ		F	K	L	S
								ADC	SUS				
1	23.0	70	50	49.0	70	95	194.0	135	122	193.0	30	292.0	5
1 1/2	35.7	70	70	61.7	100	113	244.7	135	122	206.3	33	338.0	8
2	47.8	82	82	73.8	100	128	283.8	182	167	291.9	44	447.7	11
2 1/2	59.5	105	105	85.5	100	149	339.5	—	197	309.8	46	500.3	13
3	72.3	110	110	98.3	100	158	366.3	—	197	318.2	48	526.5	15

DA-type diaphragm type (Switching valve)

DAS3type

● DA-type manual diaphragm-type switching valve

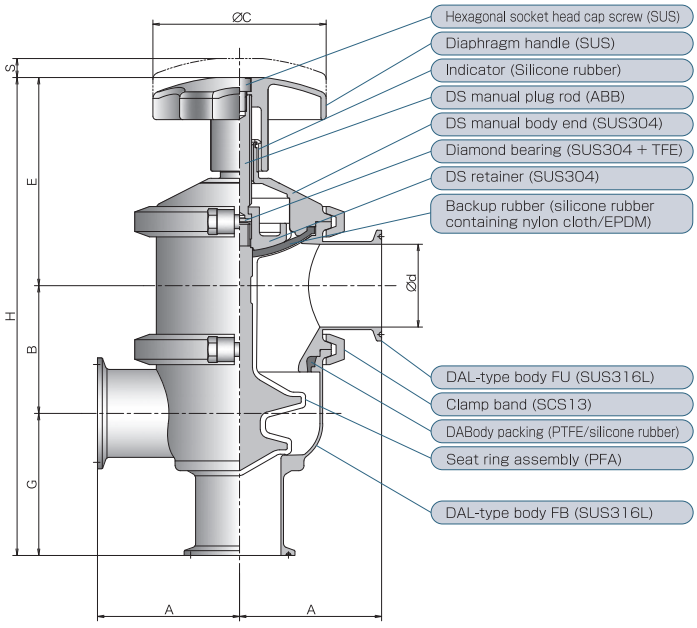
DA-type diaphragm type (Switching valve)

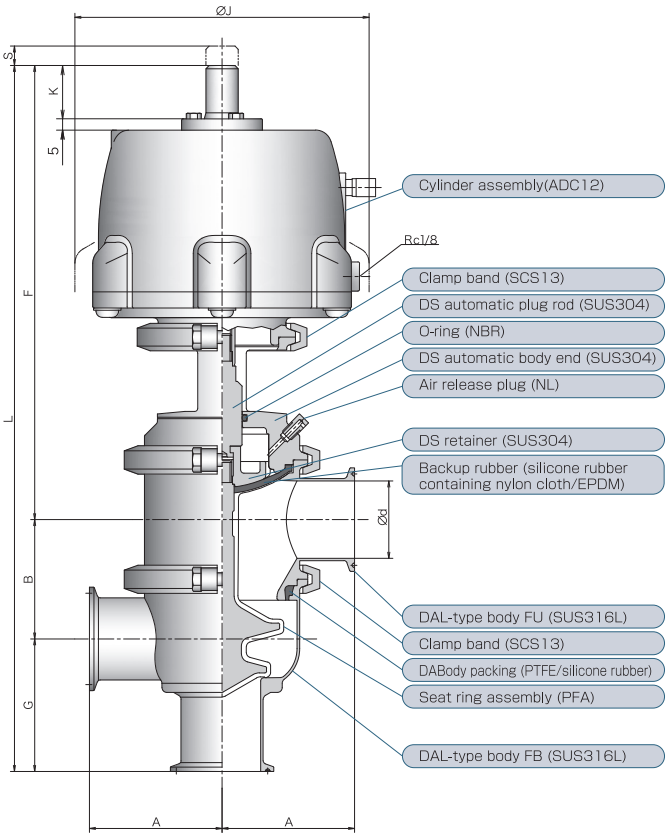
DAC3type

● DA-type automatic diaphragm-type switching valve

● ADC cylinder type ● SUS cylinder type

- Integrated design of diaphragm seat and valve plug can be possible to switch the flow line with excellent aseptic characteristics.
- Mounting in upright, inverted and horizontal positions (nozzle direction is limited) is possible, which prevents liquid pools from being generated and minimizes dead space to enable higher CIP.
- The packing material of wetted part is made of fluorocarbon resin (PFA), which not only has excellent chemical resistance but also has no influence on product liquid.
- If the temperature of the liquid changes, additional tightening of the manual valve is needed.





Dimension table (mm)

SIZE	φd	A	G	B	φC	E	H	φJ		F	K	L	S
								ADC	SUS				
1S	23.0	70	50	49.0	70	90	189	135	122	188	25	287	5
1 1/2S	35.7	70	70	61.7	100	105	236.7	135	122	198.3	25	330	8
2S	47.8	82	82	73.8	100	117	272.8	182	167	280.9	33	436.7	11
2 1/2S	59.5	105	105	85.5	100	136	326.5	—	197	296.8	33	487.3	13
3S	72.3	110	110	98.3	100	143	351.3	—	197	303.2	33	511.5	15

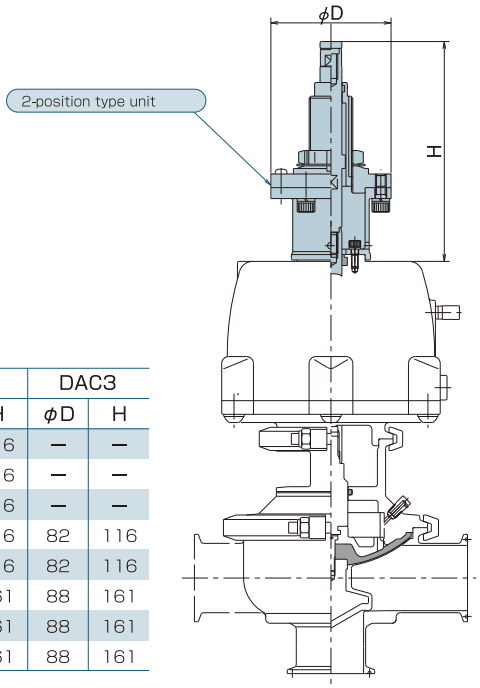
Option

2-position type unit

●Option symbol

W

When adjusting (throttling) the valve opening, attach this unit.
The valve opening can be set arbitrarily between 0 to 100%.



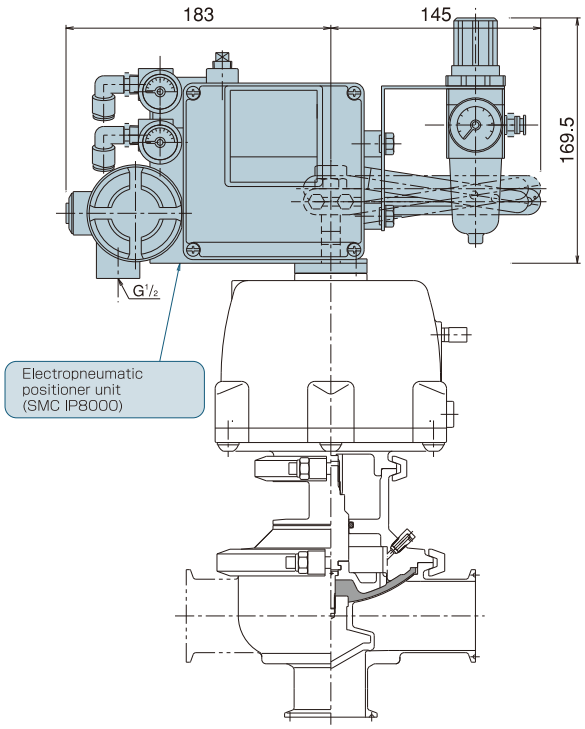
SIZE	DAC2		DAC3	
	ϕD	H	ϕD	H
8A	82	116	—	—
10A	82	116	—	—
15A	82	116	—	—
1S	82	116	82	116
1½S	82	116	82	116
2S	88	161	88	161
2½S	88	161	88	161
3S	88	161	88	161

Electropneumatic positioner unit

●Option symbol

P

Valve with electropneumatic positioner (SMC IP8000/mechanical type)
This valve can control pressure, flow rate, temperature, etc.
* Set operational air original pressure to 0.5MPa to 0.6MPa.
Valves with electropneumatic positioners (Yamatake SVX100/electronic type) are available as options.

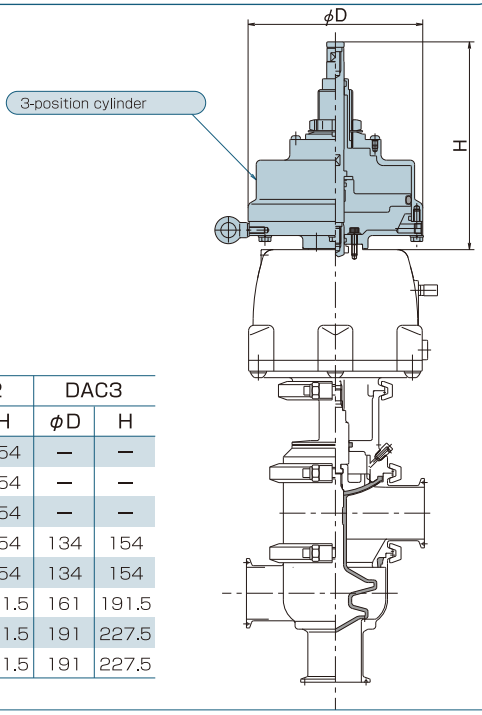


3-position type unit (normally-closed type)

●Option symbol

T

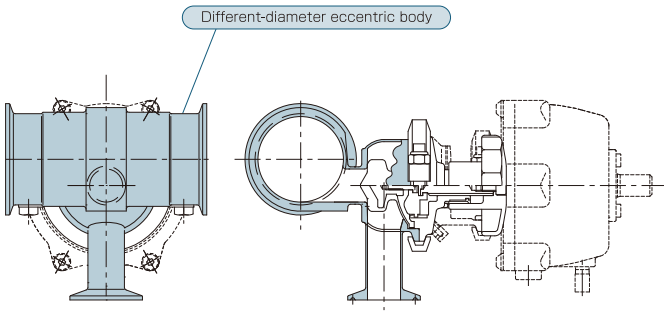
Attaching this unit enables control at 3 positions: fully closed, fully open, and arbitrary intermediate position. For example, it is possible to perform 3-stage flow rate control by flowing product liquid with the valve fully closed and half-open and flowing CIP liquid with the valve fully open.
(Fully open – Half open – Fully closed)
* Only NC type



SIZE	DAC2		DAC3	
	ϕD	H	ϕD	H
8A	134	154	—	—
10A	134	154	—	—
15A	134	154	—	—
1S	134	154	134	154
1½S	134	154	134	154
2S	161	191.5	161	191.5
2½S	161	191.5	191	227.5
3S	161	191.5	191	227.5

Use point valve

This is a valve for use-point applications with excellent C/SIP to minimize dead space.
* For further details, contact our company.



Option

DM-type tank valve (body packing type)

● Option symbol

Y

This is an inside-tank seal type valve to reduce residual flow during stirring.

DA-type tank valve (body packing type)

● Option symbol

Y

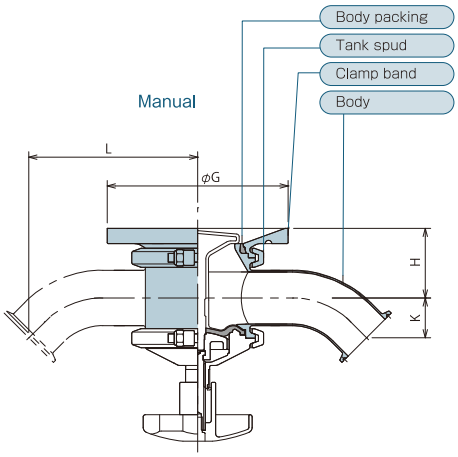
This valve is an outside-tank seal type which is attached to the bottom of the tank.

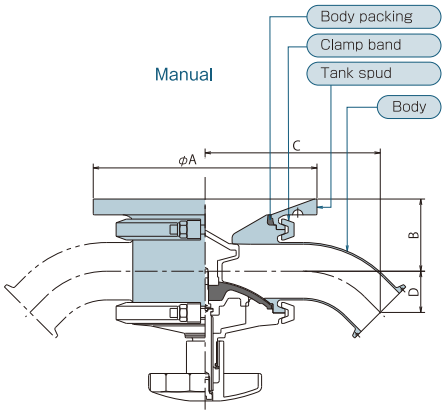
DA-type tank valve (flange packing type)

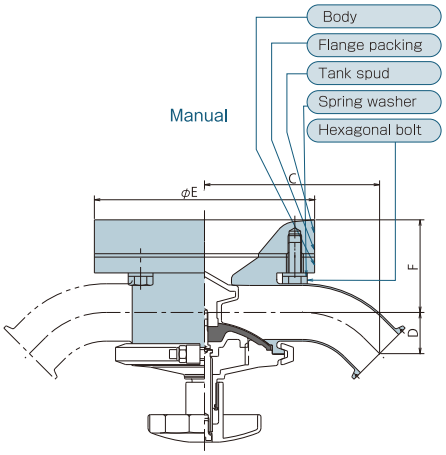
● Option symbol

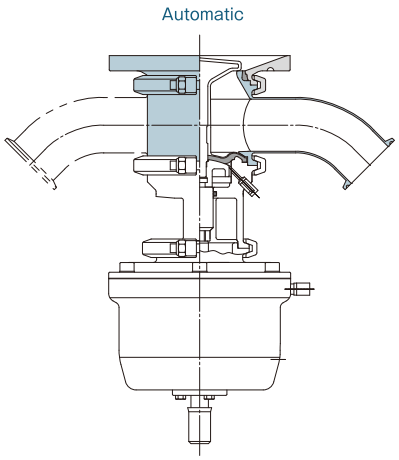
F

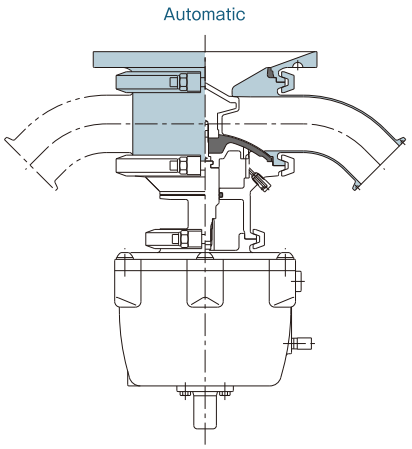
This valve is an outside-tank seal type which is attached to the bottom of the tank.

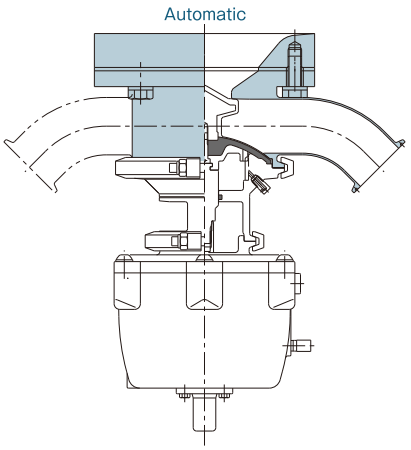












(mm)

SIZE	φA	B	C	D	φE	F	φG	H	K	L
10A	120	43.0	95	23.1	125	57.0	—	—	—	—
15A	120	45.2	95	23.1	125	59.2	—	—	—	—
1S	120	47.5	95	25.3	125	61.5	138	49.5	25.3	95
1½S	166	57.8	125	31.0	175	76.0	138	55.9	31.0	115
2S	198	63.9	155	36.5	195	82.0	166	61.9	36.5	140
2½S	198	69.7	175	43.8	195	87.9	198	69.8	43.8	175
3S	198	76.2	195	51.3	195	94.3	198	76.2	51.3	195

Weight table (kg)

SIZE	DM-type tank valve			DA-type tank valve					
				Body packing type			Flange packing type		
	Manual	Automatic		Manual	Automatic		Manual	Automatic	
		ADC	SUS		ADC	SUS		ADC	SUS
10A	—	—	—	2.1	4.1	5.3	4.4	6.4	7.6
15A	—	—	—	2.1	4.1	5.3	4.4	6.4	7.6
1S	3.2	5.2	6.4	2.2	4.2	5.4	4.5	6.5	7.7
1½S	3.7	5.6	6.8	4.0	5.9	7.1	8.0	9.9	11.1
2S	4.9	10.2	13.2	5.9	11.6	14.6	10.3	16.0	18.9
2½S	8.1	—	20.5	6.7	12.4	15.3	11.0	16.8	19.7
3S	8.3	—	20.7	7.5	13.2	16.3	11.8	17.5	20.4

* When welding the tank spud, use extra caution to prevent it from being deformed due to heat. (If the tank spud is distorted, the sealing of the tank cannot be kept, which may cause liquid leakage and corrosion.)

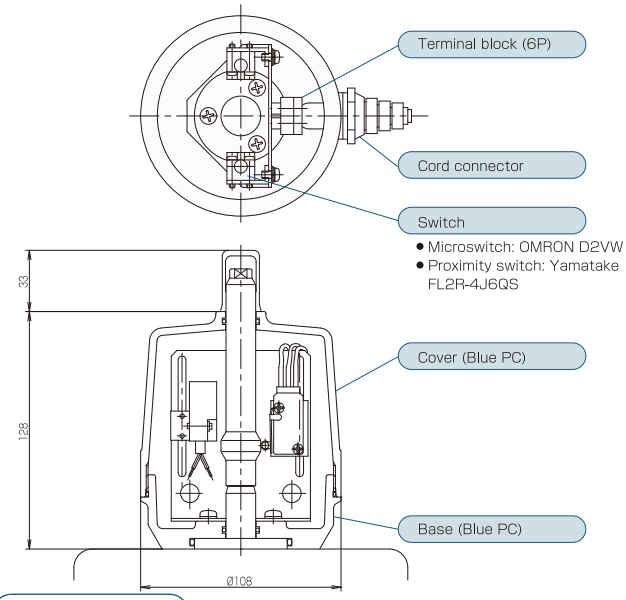
Option

► Switch-incorporated feedback unit

● C2 type Microswitch type
● A2 type Proximity switch type

A polycarbonate-resin-based limit base made by injection molding and a watertight micro switch are incorporated in the cover, which enhances the insulation withstand characteristics. Furthermore, in order to simplify instrumentation, a terminal block is provided. Perform adjustment by loosening the limit switch attachment screw and moving it up and down.

Mechanical specifications
- Proximity switch 2-wire type DC24V 100mA
- Limit switch NC, NO, 250V 4A
- Cord connector PF 1/2
- Terminal block 6P

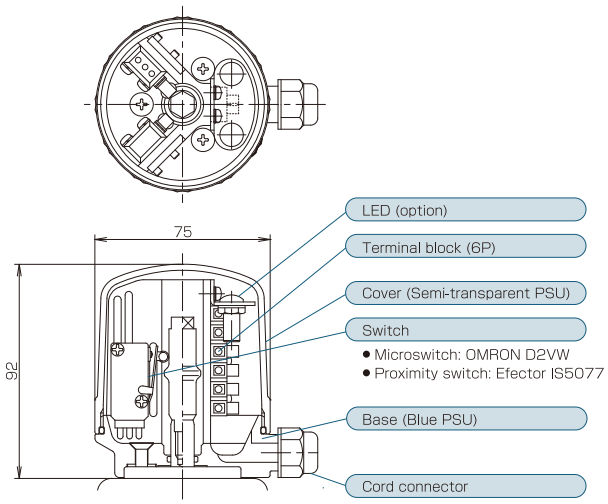


Application
- 8A – 3s: Equipped with 1 or 2 microswitches
- 8A – 3s: Equipped with 1 or 2 proximity switches

● CF type Microswitch type
● AF type Proximity switch type

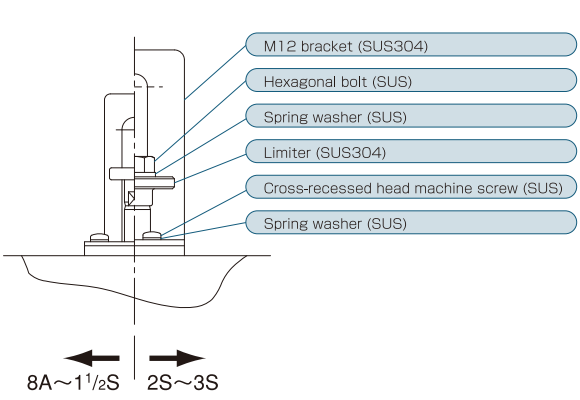
A microswitch/proximity switch is incorporated in the compact case formed by rigid polysulfone resin, which enhances the waterproof property. The cover is transparent, allowing the inside conditions to be viewed.

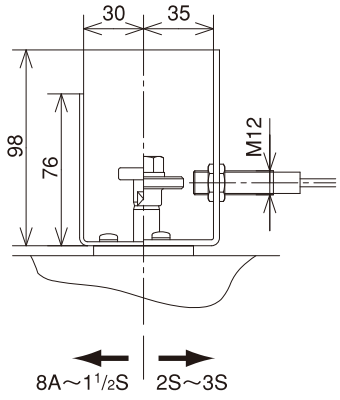
Mechanical specifications
- Proximity switch 2-wire type DC24V 100mA
- Microswitch NC, NO, 250V 4A
- Cord connector ⌀4.5～⌀8.0
- Terminal block 6P



Application
- 8A – 1½S: Equipped with 1 or 2 microswitches
- 8A – 1½S: Equipped with 1 or 2 proximity switches
- 2s – 3s: Equipped with 1 proximity switch (closed)

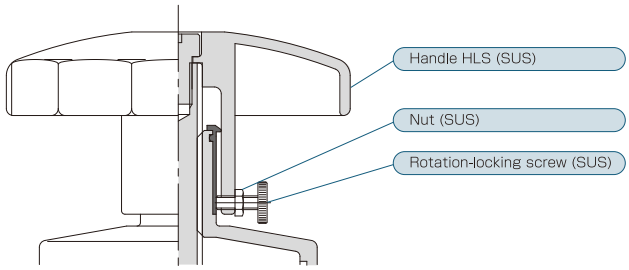
Proximity switch assembly (stay attachment type)





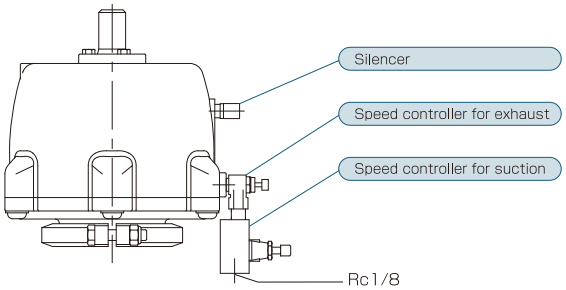
►Handle-lock mechanism

Prevent the handle loosening by the rotation-locking screw When using the valve in the situation with piping vibration or at a position on the way of the stroke.



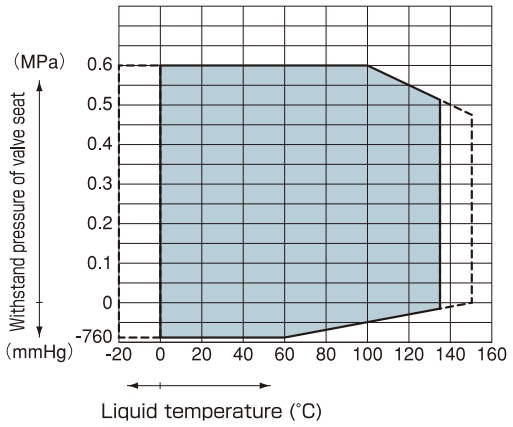
► Speed controller

Attachment of speed controller unit allows to adjust valve opening/closing speed.



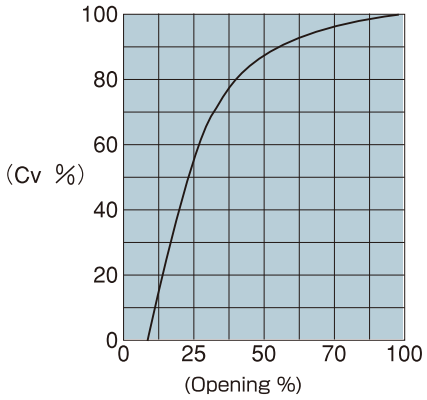
Technical material

► Withstand pressure (temperature - pressure rating)



► Cv characteristics

DAC2 type



► Cv value list by size

DAC2 type

SIZE	Flow channel		
	Low→Horizontal	Horizontal→Low	Horizontal→Horizontal
8A	4.2	3.4	4.8
10A	6.0	7.0	10
15A	9.0	12	15
1S	15	17	28
1½S	32	39	97
2S	55	81	130
2½S	95	110	210
3S	120	160	320

► Specifications for DAC2 type

Material	Main liquid contact part	Body	SUS316L						
		Diaphragm seat	PFA/SUS304						
	Main components other than liquid contact part	Bonnet part	SUS304 manual (body end), automatic (bracket)						
		Operation part	SUS304 manual (handle), ADC/SUS304 automatic (cylinder) ABB (manual plug rod)						
		Backup rubber	Silicone rubber, option EPDM						
Resistance to heat	Liquid temperature	0～135℃	(According to the above temperature-pressure rating)						
Max pressure	Max pressure of main body	1MPa							
	Max pressure of valve seat *1	0.6MPa	(According to the above temperature-pressure rating)						
Cv value	Valve size	8A	10A	15A	1s	1½s	2s	2½s	3s
	Low→ Horizontal	4.2	6.0	9.0	15	32	55	95	120
	Horizontal→ Low	3.4	7.0	12	17	39	81	110	160
	Horizontal→ horizontal passage	4.8	10	15	28	97	130	210	320
Cylinder operation air pressure		0.4MPa ～ 0.7MPa							
Cylinder operation air connection		Rc1/8							
Cylinder exhausting part		Standard: With 1/8 silencer							
Specifications for cylinder	Valve size	8A	10A	15A	1s	1½s	2s	2½s	3s
	Bore diameter (mm)	100	100	100	100	100	140	140	140
	Operation capacity (L)	0.2	0.2	0.2	0.3	0.32	0.54	0.61	0.75
Durability of diaphragm seat (reference)		In-house standard durability: 100,000 times or more (RT: Fresh water up to 150℃ steam, continuous operation durability times at 0.2 to 0.5MPa)							
Option (Symbol)	Manual	Screw-type handle lock (HLS)							
	Automatic	Exposed-type proximity switch M12 type				Incorporated-type proximity switch			
		Asi, uni-wire control head (with solenoid valve)							
		2-position type unit (W)				3-position type cylinder (T)			
		With electropneumatic positioner (Mechanical/electronic type)							

* The partial withstand pressure of 1s, 1.5s and DA03 is 0.4MPa at the operation air pressure 0.4MPa.

DA type diaphragm valve type symbol table

Name	JIS material classification	Finish classification	Pipe end classification	Size classification	Product name/type
Symbol	3 1 6 L	0 P · 1 P · 2 P	M · C · W	× ×	D
	①	②	③	④	⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪

① Material classification (main body/packing)

Category	Symbol	Material
Standard	316L	Body : SUS316L Diaphragm : PFA Backup rubber : Silicone rubber
	316L-E	Body : SUS316L Diaphragm : PFA Backup rubber : EPDM
Special	—	—

② Finish classification (main body)

Category	Symbol	Finish	
		Internal finish	External finish
Standard	0P	Pickling	Pickling or beads shot blasting
	1P	#320 to #400 buff polishing (Ra0.2)	Pickling or beads shot blasting
	2P	#320 to #400 buff polishing (Ra0.2)	#320 to #400 buff polishing (Ra0.4)
Option	ODP	Pickling	#320 to #400 buff polishing (Ra0.4)
	EP(1P)	Electrolytic polishing (Ra 0.2)	Pickling or beads shot blasting
	EP(2P)	Electrolytic polishing (Ra 0.2)	#320 to #400 buff polishing (Ra0.4)
	XP	Special	Special

③ Connection

Category	Symbol	Details
Standard	C	ISO clamp on both ends
Option	M	ISO male on both ends
	W	Weld
	N	ISO nut
Special	X	—

④ Size

Symbol	Details
02	Inner diameter 10.5 8A
03	Inner diameter 14.0 10A
04	Inner diameter 18.4 15A
10	Inner diameter 23.0 1S
15	Inner diameter 35.7 1½S
20	Inner diameter 47.8 2S
25	Inner diameter 59.5 2½S
30	Inner diameter 72.3 3S

⑤ Valve type

Symbol	Details
A	DA-type diaphragm valve
M	DM-type diaphragm valve
V	DV-type highly durable diaphragm valve Compact type (only 02 to 04 size)

⑥ Valve operation

Category	Symbol	Details
Standard	C	Automatic normally closed ON/OFF valve
	O	Automatic normally open ON/OFF valve
	S	Manual ON/OFF valve
	N ※1	Manual needle control valve
Option	W	Automatic double action

⑦ Main body type

Symbol	2L	2T	3J
Sketch			

Symbol	3K	3L	3M
Sketch			

Number in sketch shows number of ports.

※1 : DAN2 type automatic needle type control valve : The main body connection size is same diameter only, and "Seat ring ND" is equipped as standard.

⑧ Actuator type

Symbol		Bore diameter	Applicable size	
			ON/OFF valve	Switching valve/DM type
ADC	SUS			
10A	10R	φ100	For 8A~1½S	For 1S~1½S
14A	14R	φ140	For 2S~3S	For 2S
—	17R	φ170	—	For 2½S~3S
HLS		—	Screw-type handle lock	

ADC: Aluminium Dye Cast

⑨ Feedback switches classification

Category	Symbol	Type/manufacturer	Usable power voltage range	Operation style	Type or attachment
Standard	D	No feedback switch	—	—	—
	C	D2VW-5L2A-1M Limit switch made by OMRON	AC,DC250V以下	NO,NC	With cover
	A	FL2R-4J6SD Proximity switch made by Azbil	DC10~30V	NO	With cover
	J	IFC2002-ARKG/UP Proximity switch made by Efector	DC10~36V	NO	With M12 bracket
Option	Z	Non-standard specification and/or proximity switch supplied			With cover
	P				With M12 bracket
	B	In case of Asi, uni-wire system, and solenoid valve : For the detail, please refer to catalog No.18 "Valve control head".			

Note) In case of model change by switch manufacturer, the above parts may be changed to substitution or equivalent parts. Please select a standard model as much as possible.

⑩ Quantity of switches used

Symbol	Details
0	No switch
A	With M12 proximity switch bracket
B	One on closed side
C	Two on open and closed side
D	One on open side
X	Other

⑪ Options

Symbol	Details	Symbol	Details
00	No switch	0Y	Tank valve (body packing)
0S	With speed controller	0F	Tank valve (flange packing)
0W	2-position type	NW ※2	2-position type
0T	3-position type (NC)	NT ※2	3-position type (NC)
0P	With electropneumatic positioner (mechanical type)	NP ※2	With electropneumatic positioner (mechanical type)
0Z	With electropneumatic positioner (electronic type)	NZ ※2	With electropneumatic positioner (electronic type)

※2 : DA*2 type automatic needle type control valve : The main body connection size is same diameter only, and "Seat ring ND" is equipped as standard.

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