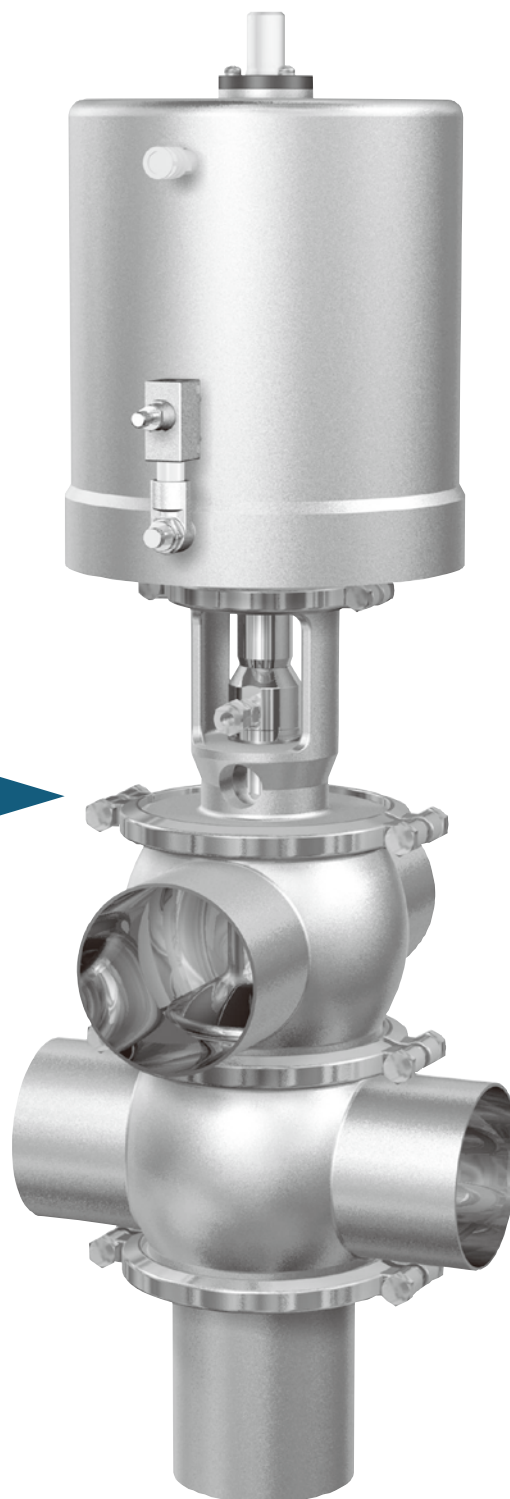




Hygienic

Double Seal Sequence Valves Non-Leak

Wide-margin
products derived
from advanced
technologies



This valve is a no-leak type double-seal valve whose leakage amount was minimized as much as possible by improving the leakage phenomenon of in-line liquid during operation of conventional double-seal valves. Minimizing leakage amount during operation can not only increase cleaning performance in the intermediate chamber but also reduce contamination around the valve. This valve is optimal for high-value liquid.

Material

SUS-304 (or equivalent)

SUS-316L (or equivalent)

Production standard

Surface finish	Internal: #320 to #400 buff polishing External: Beads shot blast
Dimensional tolerance	Face to face dimension: $\pm 1.5\text{mm}$ Angular tolerance: $\pm 0.5^\circ$
Main body max pressure	1 MPa (water pressure, normal temperature)
Valve seat max pressure	As shown in selection table on page 9 (water pressure, normal temperature)
Operating air pressure	As shown in selection table on page 9 (water pressure, normal temperature)
Operating air connection hole	Rc 1/4
Heat resistance	0~120°C

► Valve selection and ordering

Please use valves according to respective valve specifications. If an application exceeds the range of specifications, high safety design is required. We would be pleased to offer consultation if you provide us with information.

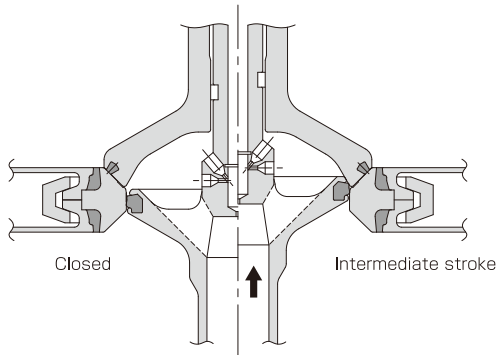
► Ordering

- ☐ If there is any request of surface finish, please specify both internal and external surface.
- ☐ For further details, refer to the sequence valve type details on page 10.

► Feature of non-leak sequence valve

- A valve consists of a main shaft assembly and sub-shaft assembly. A space is provided between the main shaft seal part and the sub-shaft seal part to form a double-seal structure. If the seal packing is broken, the liquid will be discharged to the outside through the space. As a result, there is no risk of mixing two types of liquid.
- When the valve is operating, disk seat N serves as a sliding seal, which almost prevents in-valve liquid from being leaked. This function not only increases the sanitariness level around the intermediate chamber and drain but also produces no loss of the product liquid.
- The lower part of the main shaft uses a semi-balanced type in consideration of cleaning performance, which provides excellent resistance to water hammer.
- Since this valve is a sliding seal type, if slurry fluids or gases are used, the maintenance cycle of the packing should be considered. In addition, if the valve lower-part line will serve as a closed circuit for liquid, the double-seal may not function perfectly. In this case, use a normal sequence valve.
- For the packing that comes in contact with standard product liquid, EPDM is used. This packing conforms of course to the Food Sanitation Law, and therefore can be used for a wide variety of applications. However, if it will be used for oils and fats or strong acid, consult with us.

► Operation explanatory drawing (Closed to open)

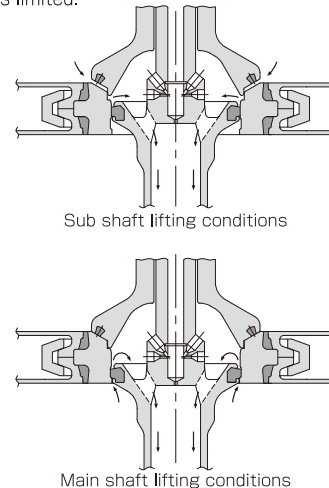
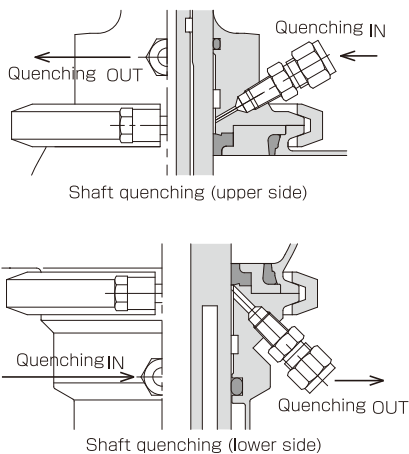


Supplying air to the drive cylinder makes the main shaft N slide and rise (disk seat N rises while sealing against the inside of valve seat N), the upper end of disk seat N closely come in contact with sub shaft N to seal the intermediate chamber, and rises up to the full-open position as it is. Also, when lowering (full open -> full closed), after disk seat N starts to seal, disk seat B of the sub shaft will seat and the main shaft will lower to the full-closed position where the double seal is formed.

► Structure explanatory drawing (Shaft quenching, disk lifter)

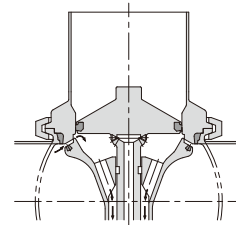
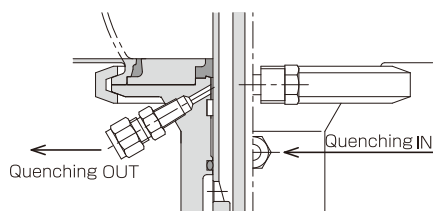
DN type

- Since this valve is a double-seal valve with shaft quenching, the shaft part exposed to the atmosphere can be cleaned at full stroke. Set the supply pressure to 0.1MPa or less to prevent back pressure at 20kPa or higher from being applied to the OUT-side quenching pipe.
- Since this valve is a double-seal valve with a disk lifter, valve CIP can be performed using line CIP liquid. The upper line (sub shaft) and lower line (main shaft) can undergo independent lifting. Set the line pressure to 0.5MPa or less and provide solenoid valves different from the solenoid valves for full-open operation. Since the side clearance system is used, the increase in pressure in the intermediate chamber during lifting is limited.



KN type

- Since this valve is a tank valve with shaft quenching, the shaft part exposed to the atmosphere can be cleaned at full stroke. Set the supply pressure to 0.1MPa or less to prevent back pressure at 20kPa or higher from being applied to the OUT-side quenching pipe.
- Since this valve is a tank valve with a disk lifter, valve CIP can be performed using line CIP. Only the sub shaft can undergo lifting. Set the line pressure to 0.5MPa or less and provide solenoid valves different from the solenoid valves for full-open operation.



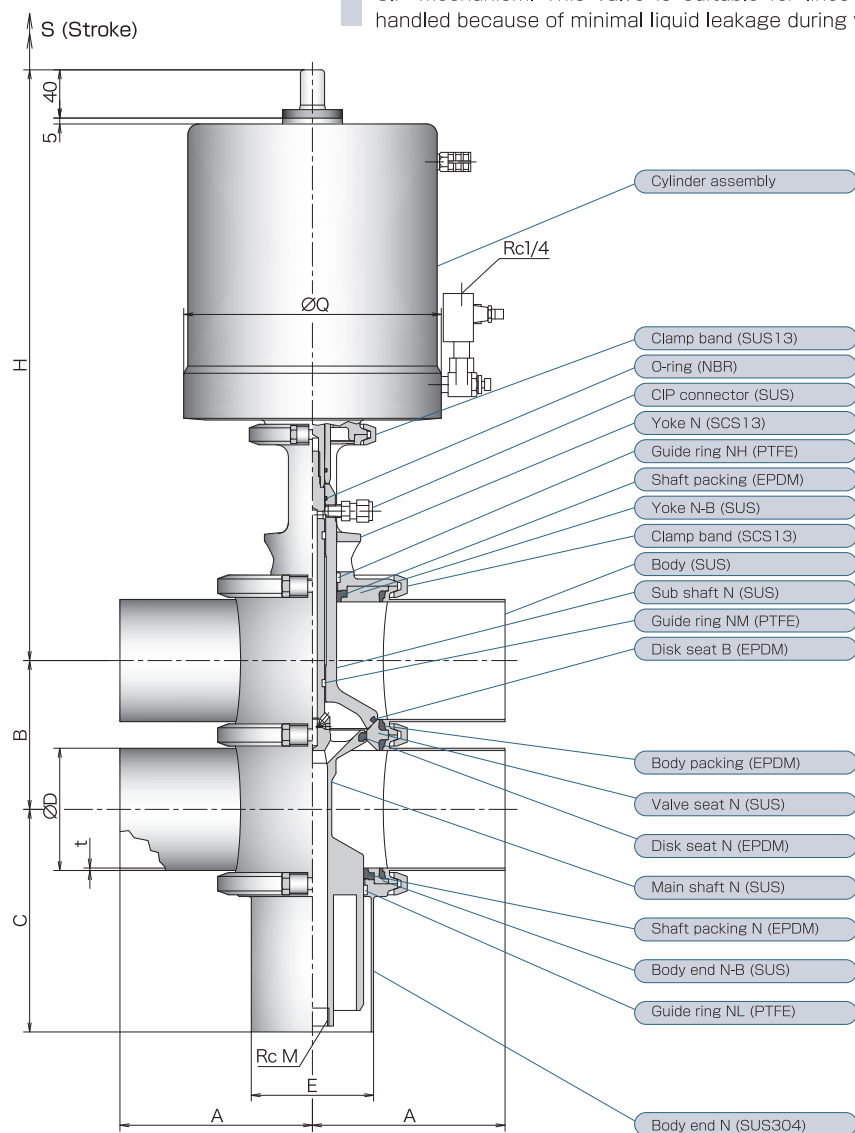
Non-leak-type double-seal valve

DN type

- ON/OFF valve
- Bottom-up type



This valve is a double-seal valve with a vent tube and is equipped with a valve CIP mechanism. This valve is suitable for lines where high-value liquid is handled because of minimal liquid leakage during valve operation.



SIZE	D	t	A ^{Note)}	B	C	Q	H	E	M	S
1 1/2	38.1	1.2	100	61.7	125.1	110.8	369.9	50.8	1/2	25
2	50.8	1.5	120	73.8	131.1	110.8	375.9	50.8	1/2	25
2 1/2	63.5	2.0	125	85.5	150.0	135.5	429.3	63.5	3/4	30
3	76.3	2.0	140	98.3	168.4	160.5	478.2	76.3	3/4	35
4	101.6	2.0	160	123.6	185.0	214.0	490.8	101.6	3/4	40
5	139.8	3.0	200	169.8	216.4	263.5	542.9	139.8	1	45
6	165.2	3.0	220	195.2	229.1	263.5	555.6	139.8	1	45

Note) ● When tube end is male, nut, clamp (1 1/2 to 4S), and sanitary flange (1 1/2 to 6S)

● Q and H dimensions are when a standard cylinder with air pressure of 0.4MPa is used.

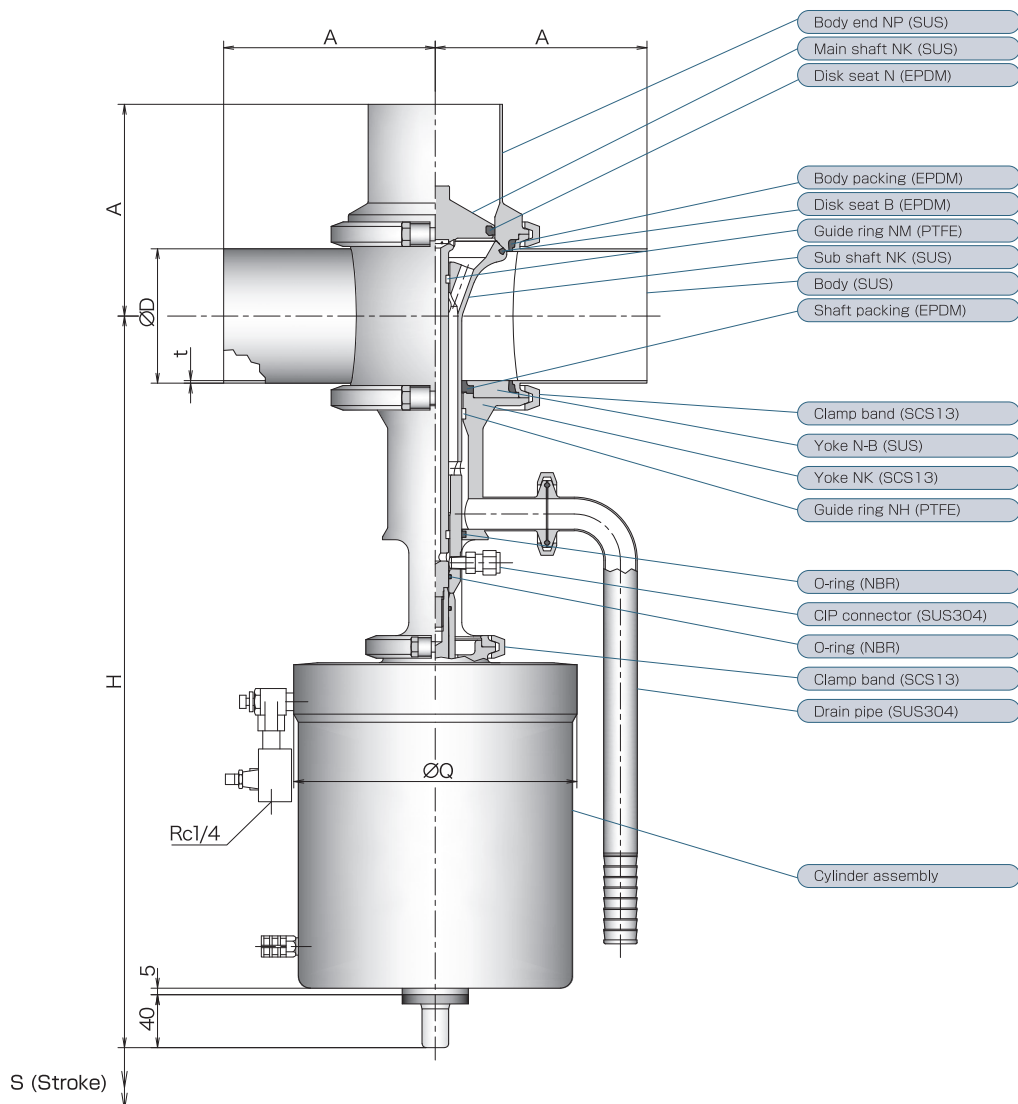
Non-leak-type double-seal tank valve

KN type

- Double-seal valve for tank bottom valve



This KN type valve is used as a tank bottom valve. This valve is a double-seal valve equipped with a cleaning mechanism, which allows line CIP to be performed with product liquid still in the tank. This valve is also very suitable as a tank sampling valve.



(mm)

SIZE	D	t	A ^{Note)}	H	Q	S
1 1/2	38.1	1.2	100	412.1	110.8	25
2	50.8	1.5	120	418.1	110.8	25
2 1/2	63.5	2.0	125	475.8	135.5	30
3	76.3	2.0	140	536.9	160.5	35
4	101.6	2.0	160	553.2	214.0	40
5	139.8	3.0	200	612.6	263.5	45
6	165.2	3.0	220	625.3	263.5	45

Note) ● When tube end is male, nut, clamp (1 1/2 to 4S), and sanitary flange (1 1/2 to 6S)
 ● Q and H dimensions are when a standard cylinder with air pressure of 0.4MPa is used.

Option

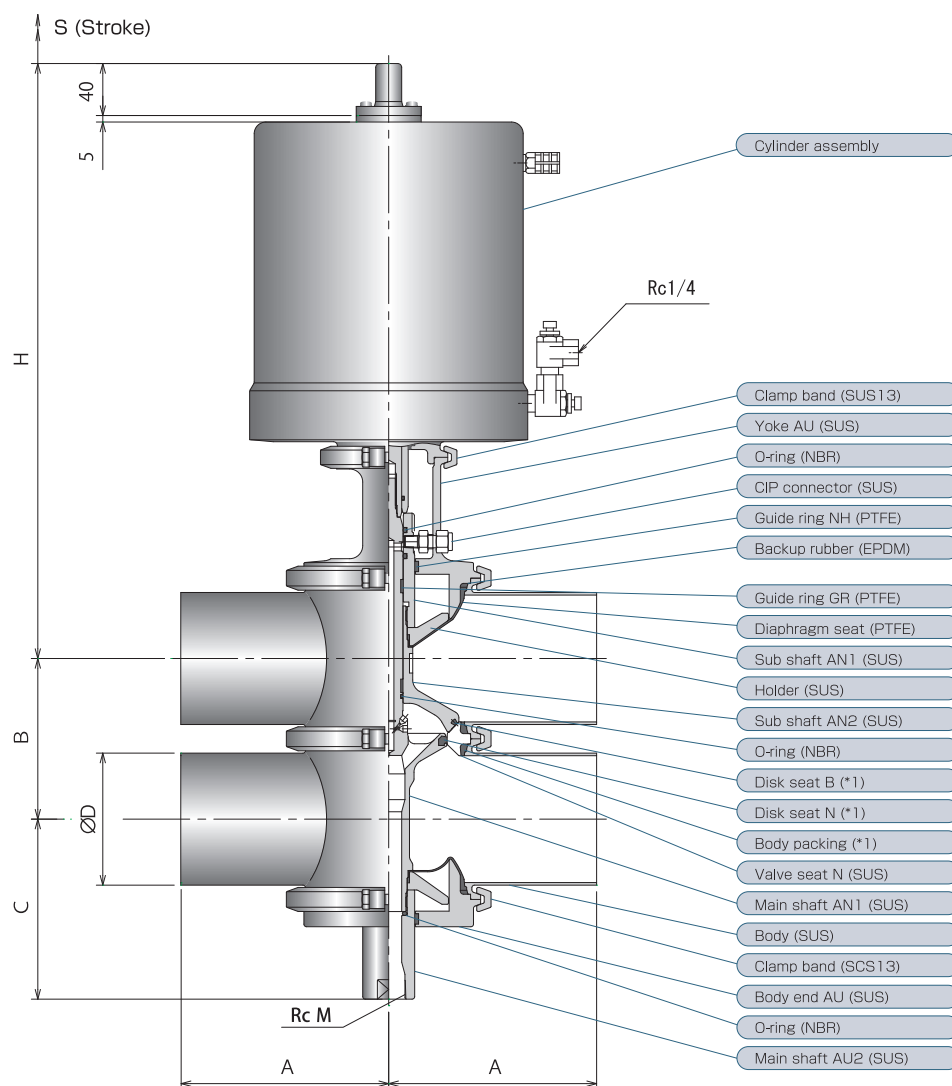
Non-leak-type double-seal valve

MNtype

- Diaphragm type ON/OFF valve
- Bottom-up type



This MN-type valve is a valve whose shaft is sealed with a PTFE diaphragm, which prevents the inside from becoming contaminated during operation of the valve.
This valve is suitable for lines where high-value liquid is handled because of minimal liquid leakage during valve operation.



(mm)

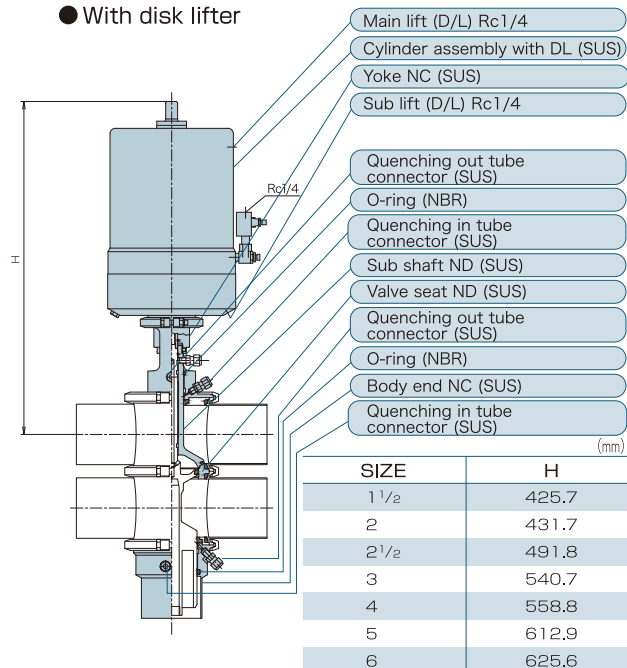
SIZE	φD	A ^{Note)}	B	C	Q	H	M	S
1 1/2	38.1	100	61.7	91.3	110.8	346.9	Rc 1/2	17
2	50.8	120	73.8	97.4	110.8	352.9	Rc 1/2	17
2 1/2	63.5	125	85.5	103.2	135.5	396.2	Rc 3/4	20
3	76.3	140	98.3	114.2	160.5	445.1	Rc 3/4	23
4	101.6	160	123.6	138.5	214.0	457.8	Rc 3/4	30
5	139.8	200	169.8	184.5	263.5	507.9	Rc 1	45
6	165.2	220	195.2	197.2	263.5	520.6	Rc 1	45

Note) ● When tube end is male, nut, clamp (1 1/2 to 4S), and sanitary flange (1 1/2 to 6S)
● Q and H dimensions are when a standard cylinder with air pressure of 0.4MPa is used.

Option

► DN type ~Option symbol CL

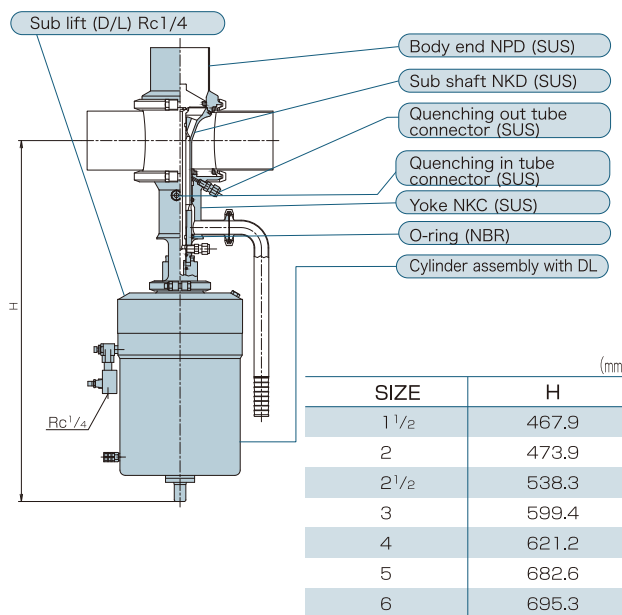
- With full-stroke shaft quenching
- With disk lifter



Note) ● H dimensions are when a standard cylinder with air pressure of 0.4MPa is used.

► KN type ~Option symbol CL

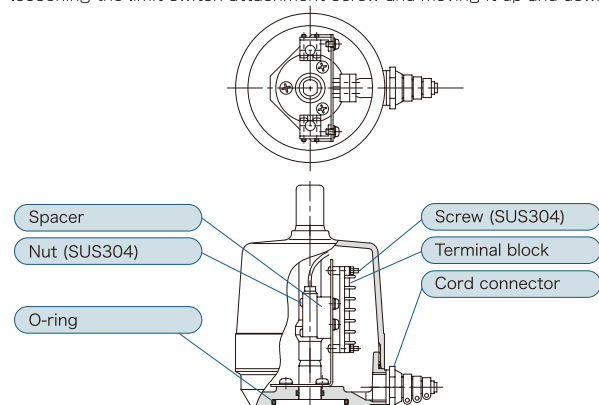
- With full-stroke shaft quenching
- With disk lifter



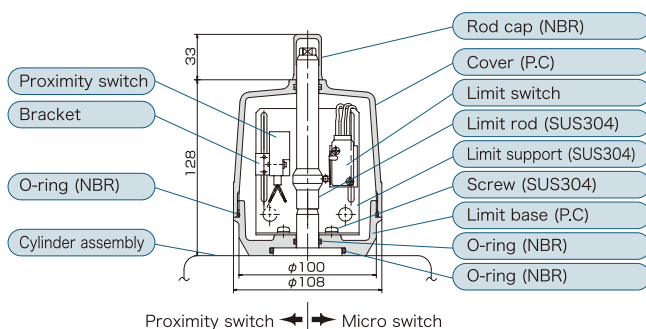
Note) ● H dimensions are when a standard cylinder with air pressure of 0.4MPa is used.

► Switch assembly with cover (proximity and micro switches)

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.



- Proximity switch 2-wire DC24V 100mA
- Limit switch NC, No. 250V 4A
- Cord connector PF1/2
- Terminal block 6P

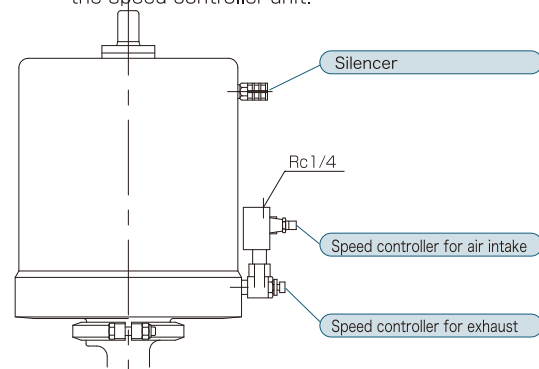


Proximity switch ← → Micro switch

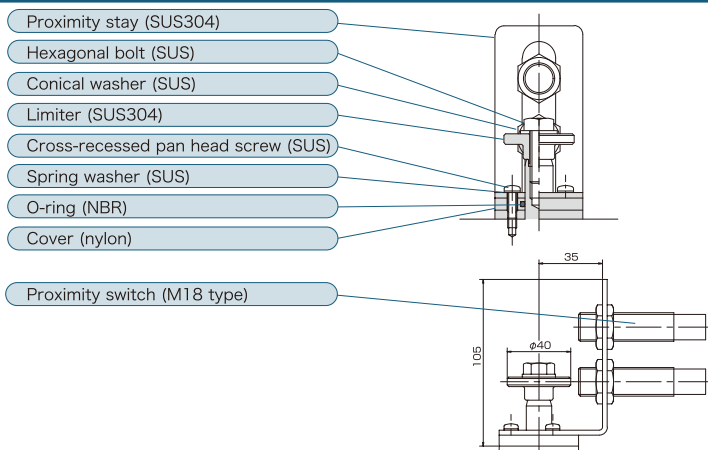
○ CF/AF type with compact cover is also available as an option. For further details, refer to the catalog of No. 18 valve control head.

► Speed controller

- The valve speed from opening to closing and from closing to opening can be controlled with the speed controller unit.

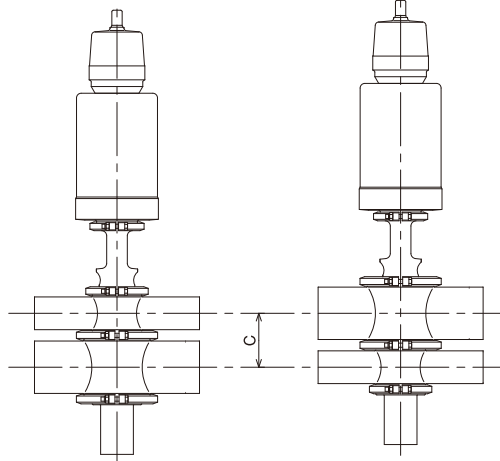


► Proximity switch assembly (Stay attachment type)



► Different diameter size

For valve main body type 2A to 2T, the sizes of the upper body and lower body can be changed.
Of course there is no liquid reservoir, etc.



(mm)

Dimension C

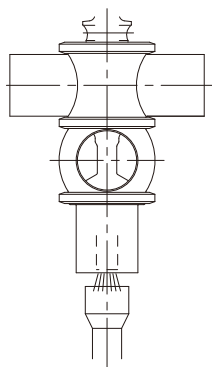


The values in the shaded part of the table at right shows the same diameter and different diameter.

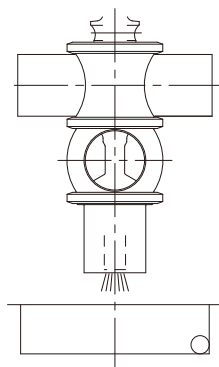
SIZE		Upper body size						
Lower body size	1 1/2	—	67.75	73.6	80.0	92.65	120.75	133.45
	2	67.75	—	79.65	86.05	98.7	126.8	139.5
	2 1/2	73.6	79.65	—	91.9	104.55	132.65	145.35
	3	80.0	86.05	91.9	—	110.95	139.05	151.75
	4	92.65	98.7	104.55	110.95	—	151.7	164.4
	5	120.75	126.8	132.65	139.05	151.7	—	182.5
	6	133.45	139.5	145.35	151.75	164.4	182.5	—

► Drain piping

- For valve blocks, attach a collecting drain pipe or a drain pan.
- For drain pipe type, drainage collection pipes with size of 3s or more are required.



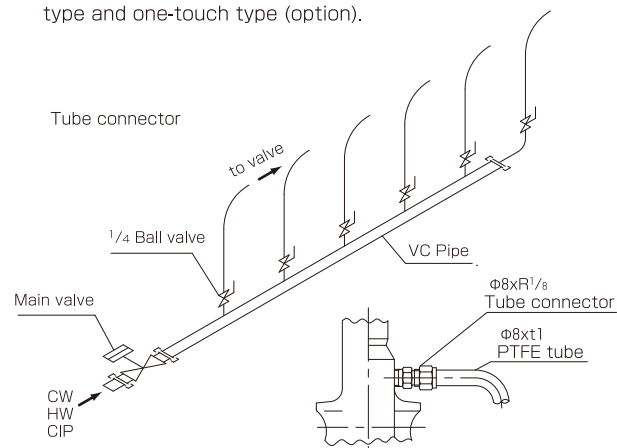
Drain pipe type



Drain pan type

► Valve CIP

- Valve CIP should be performed at the same time as line CIP.
- Between CIP connector and header pipe, perform piping using a $\Phi 8 \times 1$ mm PTFE tube.
- Two types of CIP connectors are available: Screw-in type and one-touch type (option).

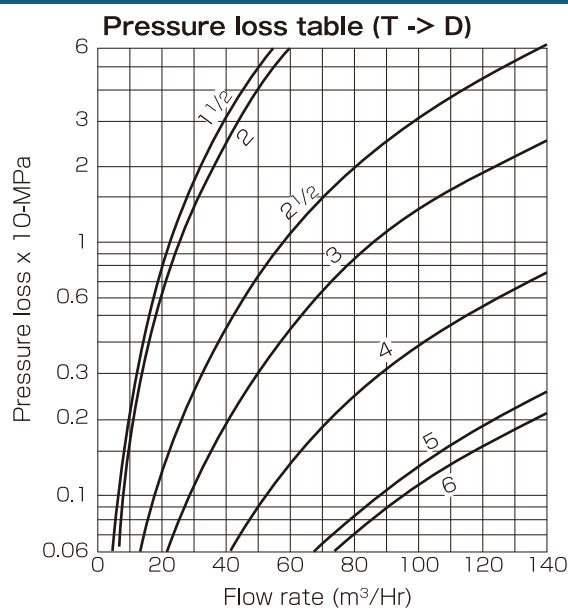


► List for consumable parts

Code Size	Disc seat N SQPN	Disc seat B SQPB	Shaft packing N SQPSN	Shaft packing SQPS	Body packing SQBP	Shaft O-ring O-RING	Guide ring NH SQPGRNH	Guide ring NL SQPGRNL	Guide ring NM SQPGRNM	O-ring (for quenching) O-RING	O-ring (for quenching) O-RING
1 1/2	15—20	15—20	15—20	25—40	15—20	P—16	15—20	15—20	15—20	P—32	P—38
2	15—20	15—20	15—20	25—40	15—20	P—16	15—20	15—20	15—20	P—32	P—38
2 1/2	25	25	25	50—60	25	P—20	25—40	25	25—40	P—40	P—53
3	30	30	30	50—60	30	P—20	25—40	30	25—40	P—40	P—60
4	40	40	40	50—60	40	P—20	25—40	40	25—40	P—40	P—85
5	50—60	50—60	50—60	25SQPSN	50—60	P—30	25SQPGRNL	50—60	50—60	P—53	P—110
6	50—60	50—60	50—60	25SQPSN	50—60	P—30	25SQPGRNL	50—60	50—60	P—53	P—110

Technical material

► Pressure loss and Cv value



Cv value

Flow SIZE	T→D	D→T	S
1 1/2	27	32	100
2	30	35	160
2 1/2	65	75	270
3	100	115	360
4	185	220	630
5	320	360	—
6	350	400	—

Flow channel

► Cylinder selection table

When using cylinders at higher pressure than the values shown below, contact our company.

Operation air pressure MPa	Fluid pressure MPa	DNC type					KNC type				
		Size					Size				
		1 1/2~2	2 1/2	3	4	5~6	1 1/2~2	2 1/2	3	4	5~6
0.39	0.29	100M	100M	125M	200M	200M	100M	125M	125M	200M	200M
	0.39	//	125M	//	//	250M	125M	//	150M	//	250M
	0.49	//	//	150M	//	//	//	150M	200M	//	
	0.59	125M	150M	200M	250M		//	//	//	250M	
	0.69	//	//	//	//		//	//	//	//	
	0.79	//	//	//	//		150M	200M	//	//	
0.69	0.29	80H	80H *1	100H	150H	150H	100H	100H *1	100H	150H	150H
	0.39	//	100H *1	//	//	200H	//	// *1	125H	//	200H
	0.49	//	//	125H	//	//	//	125H	150H	//	250H
	0.59	100H	//	150H	200H	250H	//	//	//	200H	//
	0.69	//	125H	//	//	//	//	//	//	//	//
	0.79	//	//	//	//	//	//	150H	//	//	//

*1 When equipped with a disk lifter, 125H is applicable.

► Cylinder volume

Bore diameter (mm)	80	100	125	150	200	250
Volume (L)	0.24~0.31	0.38~0.50	0.60~0.77	0.95~1.21	1.56~2.02	2.51~3.24

► Characteristics of packings

Material symbol Item	Use characteristics		
	Standard		Option
	EPDM	UC rubber (F802)	Silicone rubber
Color	Black	Black	Gray
Hygiene test (Ministry of Health and Welfare notification)	Acceptable	Acceptable	Acceptable
Application	Disk seat, body packing, shaft packing	Disk seat, body packing, shaft packing	body packing
Heat-resistant temperature*2	130°C	130°C	120°C

*2: Values are ones under static conditions but are not guaranteed ones.

Lubricant application specifications

Application specifications	Application range	Note
Standard specifications	Sliding seal part	—
Wetted surface lubrication prohibited area	O-ring part	Be sure to make the sliding packing area smooth with fresh water, etc.
Lubricant	NOK Kluber PARALIQ GTE 703*1 (NSF category H1)	

*1 Conforming to the Food Sanitation Law

Sequence valve type code table

Name	JIS material classification	Finish classification	Pipe end classification	Size classification	Product name/type
Symbol	3 0 4 · 3 1 6 L	0 P · 1 P · 2 P	M · C · W	X X	C
	①	②	③	④	⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫

① Material classification (main body/packing)

Category	Symbol	Material
Standard	304-E9	SUS 304 (or equivalent) EPDM(E81)
	304-FU	SUS 304 (or equivalent) UC rubber
Special	316L-E9	SUS 316L (or equivalent) EPDM(E81)
	316L-FU	SUS 316L (or equivalent) UC rubber

② Finish classification (Valve main body/packing)

The parts are fabricated in the same finish conditions as the main body.

Category	Symbol	Finish	
		Internal finish	External finish
Standard	0P	Pickling	Pickling or beads shot blast
	1P	#320 to #400 buff polished finish	Pickling or beads shot blast
Option	ODP	Pickling	Hairline finish
	EP	Electrolytic polishing finish	Pickling or beads shot blast

③ Pipe end classification

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

④ Size classification

Symbol	Size	
15	1 1/2S	For DNC, enter symbols in the order of upper stage and lower stage. For KNC, enter symbols in the order of line side and tank side.
20	2S	
25	2 1/2S	
30	3S	
40	4S	
50	5S	
60	6S	







⑤ Type Classification

Symbol	Details	Remarks
DN	Double seal Bottom up	On-off valve
KN		Tank valve
MN		On-off valve

⑥ Drive classification

Symbol	Details
C	Automatic normally close

⑦ Main body quantity and type

Symbol	2A	2B	2C	2D	2L	2T
TYPE	DN				KN	
Sketch						

⑧ Cylinder type
(Refer to the cylinder selection table)

Symbol	Type	Symbol	Type
08M	80M	08H	80H
10M	100M	10H	100H
13M	125M	13H	125H
15M	150M	15H	150H
20M	200M	20H	200H
25M	250M	25H	250H

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/DC<250V	NO,NC	Type with cover
	A	FL2R-4J6SD Proximity switch made by Azbil	DC10~30V	NO	Type with cover
	J	IGC2005-ARKG/UP Proximity switch made by Efecter	DC10~36V	NO	Type with M18 stay
	U	FL7M-7J6HD Proximity switch made by Azbil	DC10~30V	NO	Type with M18 stay
	R	FL7M-7K6H Proximity switch made by Azbil	DC10~30V	NC	Type with M18 stay
Special	Z	For nonstandard specifications with proximity switch supplied			Type with cover
	P				Type with stay
	B	Asi: For uni-wire system with a solenoid valve. For further details, refer to the catalog of valve control head.			

(Note) Above parts may be subject to substitution with equivalent parts due to change in model of switch manufacturer. Select a standard model as much as possible.

⑩ Number of switches used

Symbol	Details
0	No switch
1	One switch on closed side
2	Two switches on open and closed sides
3	One switch on open side
X	Other

⑪ Main body options

Symbol	Details
0	No option
C	With shaft quenching

⑫ Cylinder option

Symbol	Details
0	Standard
L	Disc lifter

Section for entry of special notes

- If using nonstandard specifications for the lubricant application specifications on Page 9, be sure to designate them.
- If the specification is not specified, lubricant is applied.
- Safety of lubricant to be applied:
- NSF category H1
- Conforming to the Food Sanitation Law



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