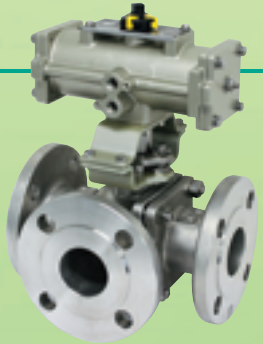
Catalog No. **BE302-04**

NDV BALL VALVES

NIPPON DAIYA VALVE Co., Ltd.

3-Way Ball Valve

Lever Operated
Ball Valve
E300NB-L2



Pneumatically Operated
ON-OFF Ball Valve
EPN1300NB-L2

Pneumatically Operated
ON-OFF Ball Valve
EPN1300N-T3

Electrically Operated
Ball Valve
EMS4300NB-T4

Contents

2

3-Way Ball Valve

Seat Mechanism (Port Shape and Seat Number)

Changeover Form

Valve Code for E300NB(N)

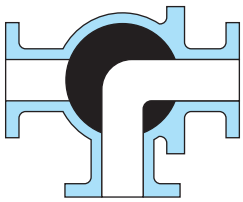
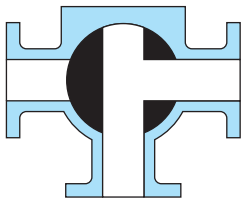
2-1. 2 seats 3-Way Ball Valve: E300NB-L2

2-2. 4 seats 3-Way Ball Valve: E300NB-T4/L4

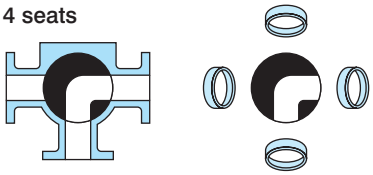
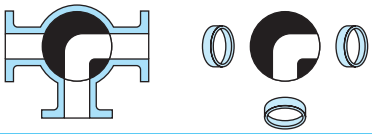
2-3. 3 seats 3-Way Ball Valve: E300N-T3/L3

Seat Mechanism (Port Shape and Seat Number)

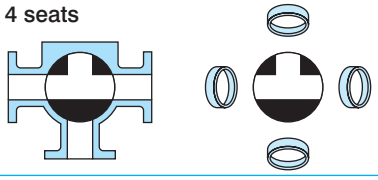
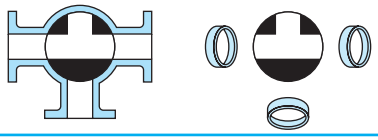
E300NB(N): L-Port/T-Port

L-Port (L2, L4, L3)	T-Port (T4, T3)
For flow path switching	For fluid diverting and mixing
	

L-Port

Code	Flow Path and Seat Number	Nominal Size	Notes
L2	 2 seats 	DN15 to 200	Seats are compatible with those of 2 way valve (F100NB). (*L2 type* has not a seat at the center. To prevent fluid deposit, *L4 type* will be applied.)
L4	 4 seats 	DN15 to 100	Seats are not compatible with those of 2 way valve (F100NB).
L3	 3 seats 	DN125 to 200	

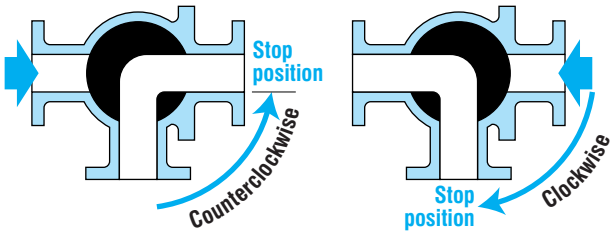
T-Port

Code	Flow Path and Seat Number	Nominal Size	Notes
T4	 4 seats 	DN15 to 100	Seats are not compatible with those of 2 way valve (F100NB).
T3	 3 seats 	DN125 to 200	

Changeover Form

L-port

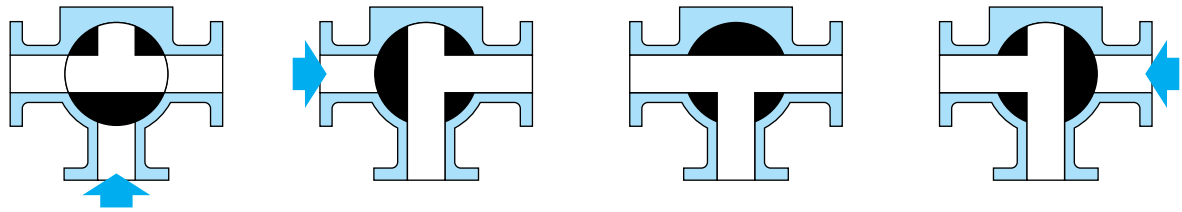
Right figure is the standard for L-Port type changeover form.
If automatic valve is applied, please specify form ① or ② as its shut-down form of the operation when the power (air or electricity) is lost.



Form ① Form ②

T-Port

For T-port, such ① & ② or ① & ④ of below figure will be selected as changeover form of 90° rotation. If automatic valve is applied, select and specify either of form ①, ②, ③ or ④ as its shut-down form when the operation power (air or electricity) is lost.



Form ① Form ② Form ③ Form ④

If a high pressure comes to a port as arrow mark in the above figure, a little leakage may occur to a low pressure side.

Valve Codes

Valve Code for E300NB(N)

E 3 0 7 N B - L 2 - N T F - 0 5 0 - J 1 0 K R F

① * ② ③ ④ ⑤

E300NB-L2/T4 (L4), E300N-T3(L3) (3-Way Ball Valve)

① Body Material

04	FCD400
07	SCS13A
12	SCS14A
13	SCS16A

② Seat Mechanism

	Port Shape	Seat Number
L2	L-Port	2
L3		3
L4		4
T3	T-Port	3
T4		4

③ Seat Material (Refer to Page 10)

NTF, NCF, NGR, CFM, CFMR

✻ Improvement Identification Code

None	Original Design
N	First Improvement
NB	Second Improvement
NC	Third Improvement
ND	Fourth Improvement

④ Nominal Size (DN or A)

Conforming to ISO6708 and JIS B2001

⑤ Connection

J10KRF	JIS 10KRF
A150RF	ASME CL150

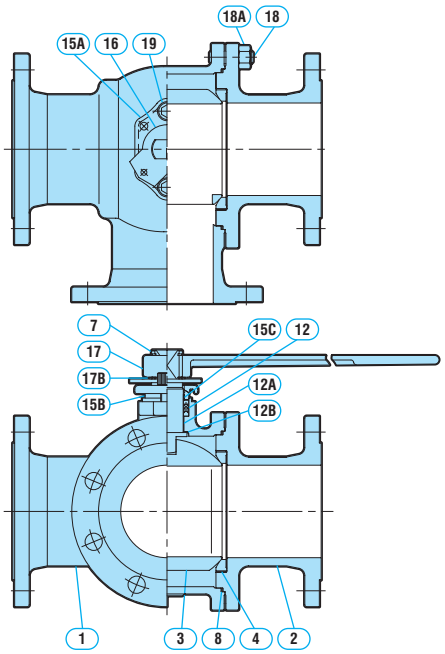
2-1 2 Seats 3-Way Ball Valve: E300NB-L2 Type

Structure and Features

The shape of the port is L Type. The valve is used for switching fluid.

Parts and Materials

The materials of the components are as below as far as there are no special requests.



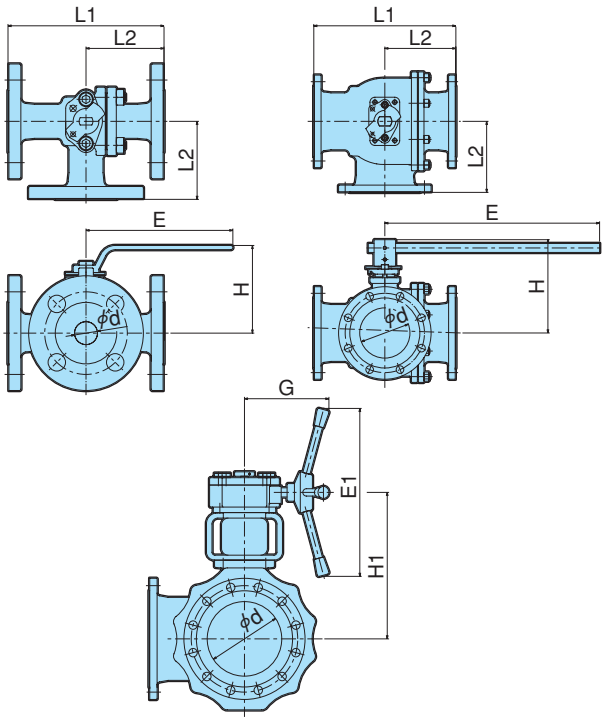
The above structure may have small differences according to the nominal size.

Parts		Material		
		E304NB-L2	E307NB-L2	E312NB-L2
1	Body	FCD400	SCS13A	SCS14A
2	Cap	FCD400	SCS13A	SCS14A
3	Ball	SCS13A or SUS304		SCS14A or SUS316
4	Seat	NTF, NCF, NGR, CFM, CFMR, CFMO		
7	Stem	SUS304		SUS316
8	Gasket	New-PTFE		
12	Packing	New-PTFE		
12A	Bearing	New-PTFE		
12B	Thrust Washer	New-PTFE		
15A	Gland Flange	SCS13A		
15B	Gland	SUS304		
15C	Bearing	New-PTFE		
16	Travel Stop	SUS304		
17	Lever	SCPH2 (DN15 to 100)		
		SCPH2 & STK490 (DN125 to 200)		
17B	Retaining Ring	SUS304		
18	Stud Bolt	SNB7	SUS304	
18A	Nut	S45C	SUS303	
19	Cap Screw	SUS304		

Applicable Class (DN15 to 200)

Body Material	Class
FCD400, SCS13A	JIS10K
SCS14A	JIS10K, CL150

Dimension



Unit: mm

Nominal size DN	d	L1	L2	H	E	H1	G	E1	Mass (Approx. kg) Stainless Cast Steel 10K Lever Operated	Mass (Approx. kg) Stainless Cast Steel 10K Gear Operated
15	13	146	73	80	130	—	—	—	2.9	—
20	19	150	75	85		—	—	—	3.6	—
25	25	170	85	100	160	—	—	—	5.6	—
40	38	200	100	115	230	—	—	—	8.8	—
50	51	230	115	120		—	—	—	11.7	—
65	64	260	130	135	350	—	—	—	19.0	—
80	76	280	140	145		—	—	—	23.0	—
100	102	340	170	180	450	280	165	240	36.0	50.0
125	127	370	185	260	650	342	190	300	60.0	87.0
150	152	430	215	280		362			79.0	106.0
200	203	520	260	350	800	425	230	460	140.0	177.0

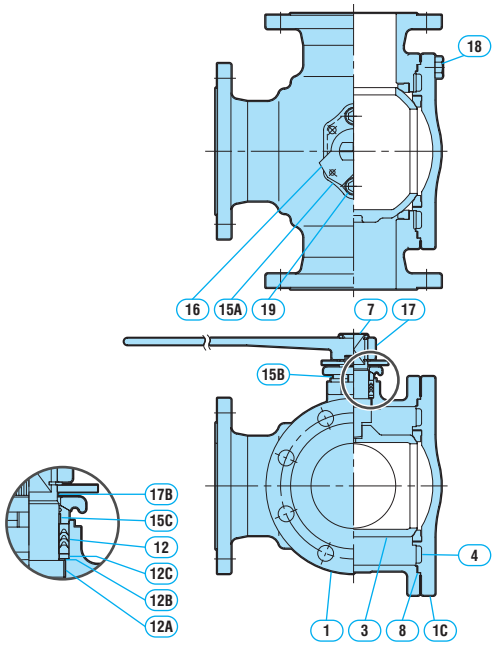
2-2 4 Seats 3-Way Ball Valve: E300NB-T4/L4

Structure and Features

T-Port type is NDV standard but L-Port type is also available.
The valve is used for switching, separating or mixing fluid.

Parts and Materials

The materials of the components are as below as far as there are no special requests.



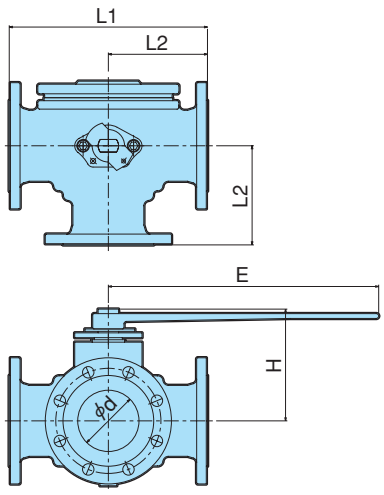
Parts		Material		
		E304NB-T4/L4	E307NB-T4/L4	E312NB-T4/L4
1	Body	FCD400	SCS13A	SCS14A
1C	Side Cover	FCD400	SCS13A	SCS14A
3	Ball	SCS13A		SCS14A
4	Seat	NTF, NCF, NGR		
7	Stem	SUS304		SUS316
8	Gasket	New-PTFE		
12	Packing	New-PTFE		
12A	Bearing	New-PTFE		
12B	Thrust Washer	New-PTFE		
12C	Washer	SUS316		
15A	Gland Flange	SCS13A		
15B	Gland	SUS304		
15C	Bearing	New-PTFE		
16	Travel Stop	SUS304		
17	Lever	SCPH2		
17B	Retaining Ring	SUS304		
18	Bolt	SUS304		
19	Cap Screw	SUS304		

Applicable Class (DN15 to 100)

Body Material	Class
FCD400, SCS13A	JIS10K
SCS14A	JIS10K, CL150

JIS20K (CL300) is also available.

Dimension



Unit: mm

Nominal size DN	d	L1	L2	H	E	Mass (Approx. kg) Stainless Cast Steel 10K
15	19	140	70	95	160	3.7
20						4.2
25	25	160	80	105	230	6.6
40	38	180	90	119		9.0
50	51	200	100	129	350	13.7
65	64	240	120	140		19.5
80	76	260	130	167	450	28.0
100	102	330	165	182		35.0

This valve is not compatible with E300NB-L2 in face to face dimension and parts.

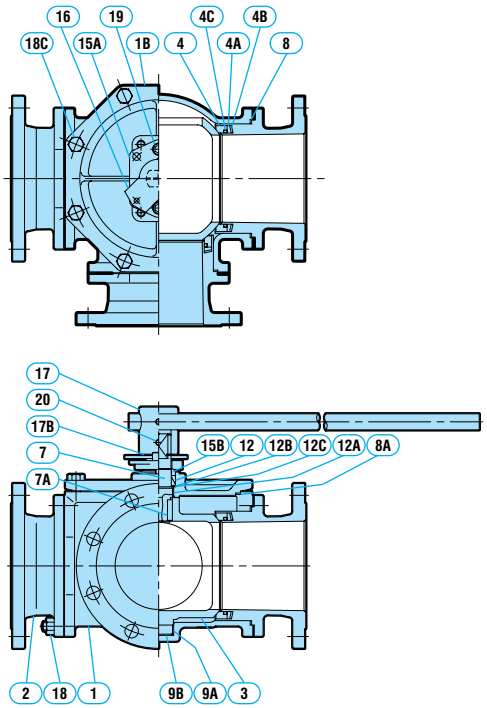
2-3 3 Seats 3-Way Ball Valve: E300N-T3/L3

Structure and Features

T-Port type is NDV standard but L-Port type is also available.
The valve is used for switching, separating or mixing fluid.

Parts and Materials

The materials of the components are as below as far as there are no special requests.



This valve is not compatible with E300NB-L2 in face to face dimension and parts.

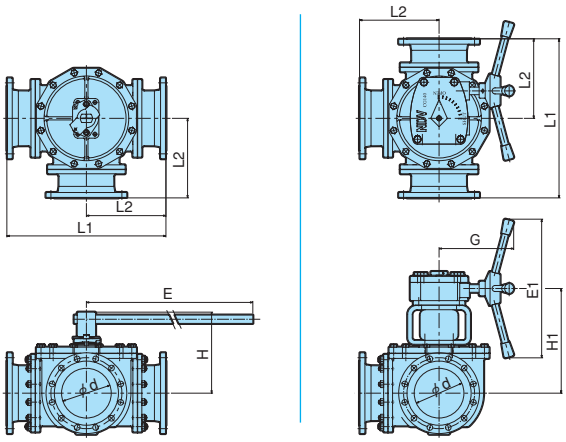
Parts		Material			
		E304N-T3/L3	E307N-T3/L3	E312N-T3/L3	E313N-T3/L3
1	Body	FCD-S	SCS13	SCS14	SCS16
1B	Cover	FCD-S	SCS13	SCS14	SCS16
2	Body Connector	FCD-S	SCS13	SCS14	SCS16
3	Ball	SCS13		SCS14	SCS16
4	Seat	NTF, CF, GR			
4A	Spacer	SUS304		SUS316	SUS316L
4B	Spring	SUS329J3L			
4C	O-Ring	NBR (✻1)	FKM (✻2)		
7	Stem	SUS420J2	SUS304	SUS316	SUS316L
7A	Key	SUS304		SUS316	SUS316L
8	Gasket	PTFE			
8A	Gasket	PTFE			
9A	Bearing	PTFE			
9B	Thrust Washer	PTFE			
12	Packing	PTFE			
12A	Bearing	PTFE			
12B	Thrust Washer	PTFE			
12C	Washer	SUS304		SUS316	SUS316L
15A	Gland Flange	FCD400	SCS13		
15B	Gland	SUS304			
16	Travel Stop	SUS304			
17	Lever	FCD400 & STK50			
17B	Retaining Ring	SUS304			
18	Stud Bolt/Nut	SS400	SUS304		
18C	Bolt	SS400	SUS304		
19	Cap Screw	S45C	SUS304		
20	Set Screw	SUS304			

Remarks
(✻1) Fluid temperature is up to 80°C
(✻2) Fluid temperature is up to 150°C
For (✻1) and (✻2), if the fluid is solvent, the materials may not be used.

Applicable Class (DN125 to 200)

Body Material	Class
FCD-S, SCS13	JIS10K, CL150
SCS14, SCS16	JIS10K, CL150

Dimension



Unit: mm

Nominal size DN	d	L1	L2	H	E	H1	G	E1	Mass (Approx. kg) Stainless Cast Steel 10K Lever Operated	Mass (Approx. kg) Stainless Cast Steel 10K Gear Operated
125	127	430	215	260	800	340	230	460	82.5	110.0
150	152	500	250	275		352			104.0	132.0
200	203	650	325	335	1100	434	260		177.0	226.0

6

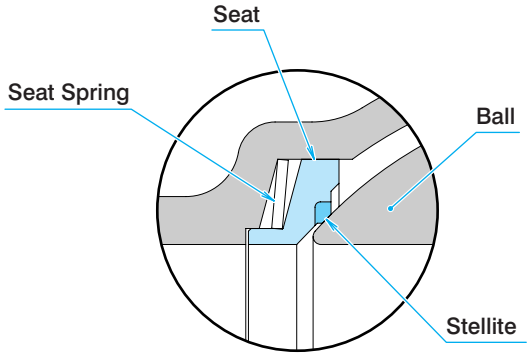
Special Purpose Ball Valve

6-1 High Temperature Ball Valve

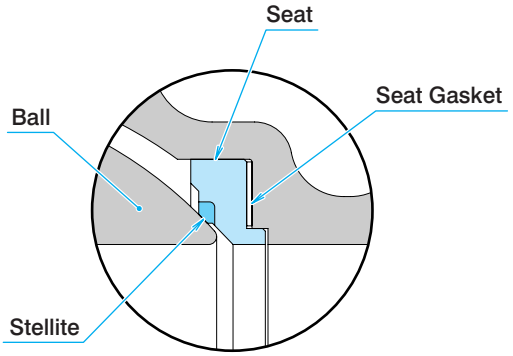
Metal Seat Ball Valve

Features of Metal Seat (Code: ST)

- Maximum Working Temperature 500°C (may have some limit according to the working condition.)
- Superior in abrasion resistance, applicable to abrasive fluids such as powder and slurry.
- Applicable to flow control at intermediate opening position.



Inlet Side Seat



Outlet Side Seat

Specification

Applicable Type	F100NB, E100JNC
Nominal Size	DN15 to 200
Connection	Flanged type JIS10K, 20K (*1) Class (ASME, JPI) 150,300 (*2)
Body Material	FCD400, SCS13A, SCS14A
Seat Material	SUS304 & ST, SUS316 & ST
Ball Material	SUS304 & SFNi, SUS316 & SFNi (SFNi: Nickel base fusible alloy Thermal spraying deposit on Ball)

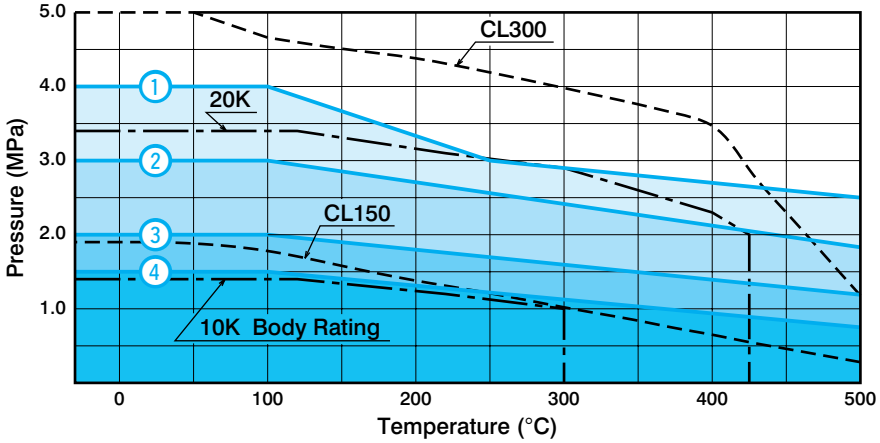
*1: JIS B2220 *2: ASME B16.5

Allowable Seat Leakage

Nominal Size (DN)		15	20	25	40	50	65	80	100	125	150	200
Allowable leakage (cc/min)	Hydraulic Pressure 0.3MPa	0.014	0.018	0.023	0.036	0.045	0.059	0.072	0.09	0.11	0.14	0.18
	Air Pressure 0.6MPa	0.8	1.1	1.4	2.2	2.7	3.5	4.3	5.4	6.8	8.1	10.8

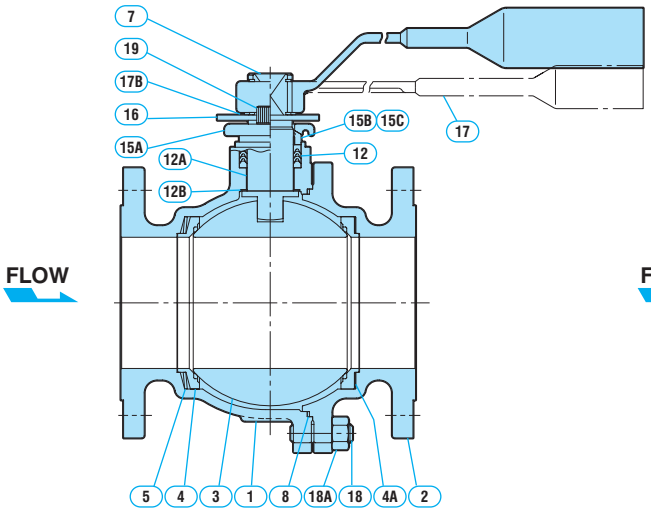
Allowable Leakage of hydraulic pressure is according to ASME B16.104 Class V.
Allowable leakage for air pressure is calculated by those for hydraulic pressure considering water and air leakage ratio written in *JIS B2003 General rules for inspection of valves.*

Working Pressure and Temperature Range

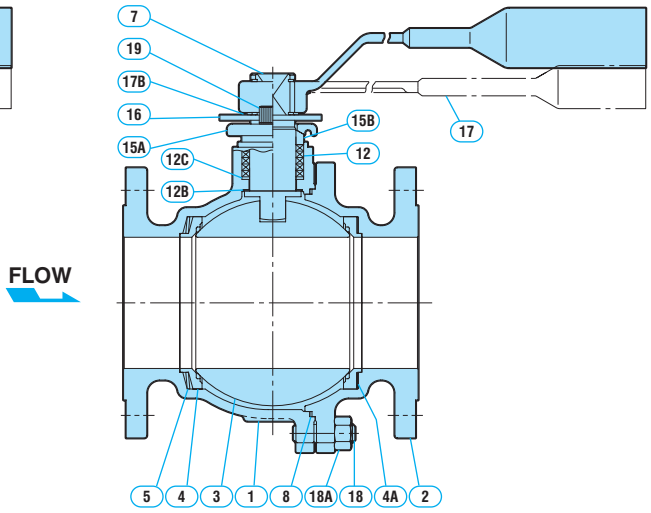


Dimension ①DN15 to 25 ②DN40 to 65 ③DN80, DN100 ④DN125 to 200

Parts and Materials



Standard Specification



High Temperature Specification

Code / Working / Parts / Temperature		Standard Specification			High Temperature Specification	
		F104NB-ST	F107NB-ST	F112NB-ST	FH107NB-ST	FH112NB-ST
		-5 to 250°C	-29 to 250°C		251 to 500°C (✻2)	
1	Body	FCD400	SCS13A	SCS14A	SCS13A	SCS14A
2	Flange	FCD400	SCS13A	SCS14A	SCS13A	SCS14A
3	Ball	SUS304 & SFNi		SUS316 & SFNi	SUS304 & SFNi	SUS316 & SFNi
4	Seat	SUS304 & ST		SUS316 & ST	SUS304 & ST	SUS316 & ST
4A	Seat Gasket	High intensity fiber reinforced expanded graphite			Expanded graphite & SUS316L	
5	Seat Spring	SUS316CSP or SUS316H			SUS316CSP or SUS316H (✻3)	
7	Stem	SUS304 (✻1)		SUS316 (✻1)	SUS630 (H900)	
8	Gasket	NTF			Expanded graphite & SUS316L	
12	Packing	NTF			Wire reinforced expanded graphite	
12A	Bearing	NTF			—	
12B	Thrust Washer	NTF			SUS304CSP	
12C	Gland Flange	—			SUS304CSP	
15A	Gland Packing	SCS13A			SCS13A	
15B	Gland Packing Ring	SUS304			SUS304	
15C	Stem Bearing	NTF			—	
16	Travel Stop	SUS304			SUS304	
17	Lever	Standard Lever & Pipe			Standard Lever & Pipe	
17B	Retaining Ring	SUS304			SUS304	
18	Stud Bolt	SNB7	SUS304		SUS304	
18A	Nut	S45C	SUS303		SUS303	
19	Cap Screw	S45C	SUS304		SUS304	

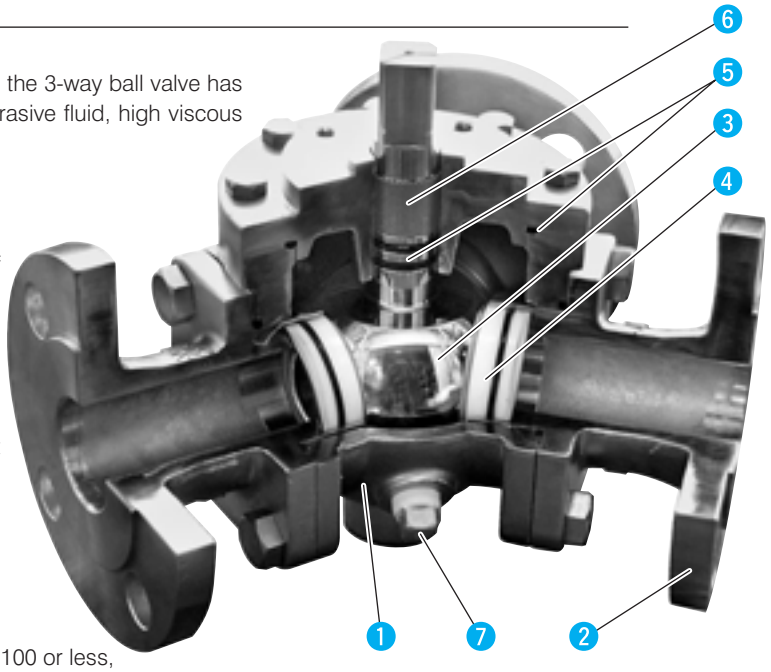
✻1: DN15 and DN20 are of SUS329J1 ✻2: 400°C is the maximum in oxidative atmosphere. ✻3: Inconel X750 for over 351°C

6-2 Y-Shaped 3-Way Ball Valves

Main Applications

- High abrasive fluid such as Powder and Slurry
- Solid etc such as pellet
- Usage of pigs or spheres for cleaning piping

Features



1 Wide Angle Body Shape
While normal 3-way ball valve has a 90 degrees angle, the 3-way ball valve has a wide angle of 135 degrees. It is suitable for high abrasive fluid, high viscous fluid or usage of pigs or spheres for cleaning piping.

2 Flexible installation position
Straight type and 22.5 degrees type flanges are available. By the combination of these two types of flange at three ports of valve, 54 piping patterns are possible. (Refer to "Flange Application Model")

3 Ball Design
Since the ball and the stem are integrated (fixed valve), the gap of angle at the valve face and the stem will not occur. In addition since the radius curvature of the ball port is 1.5 times than that of the bore, pressure loss is small and the damage of the ball can be minimized even in high abrasion fluid flow.

4 Inlet Side Seal Mechanism
The spring at the seat rear side (rubber cushion for DN100 or less, metal spring for DN125 or more) provides excellent sealing even in heat cycle and pressure fluctuations. Moreover, since the sealing is done at inlet side, the functional deterioration by fluid flowing into the pocket can be minimized.

5 O-Ring Seal
O-Rings used at each seal provide stable sealing performance and eliminates the need for periodical tightening.

6 Stable Bearing Performance
Reinforced PTFE are used for the bearings for the shafts above and below the ball. This prevents galling and enables the valve to cope with very frequent operation.

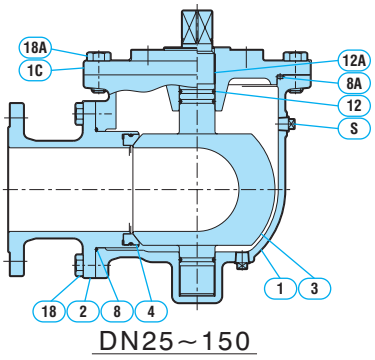
7 Purge hole
The body has two purge holes. They can be used for the prevention of fluid congestion by air charge, the leakage check for seat abrasion, and the purge of fluid remaining at pockets.

Specification

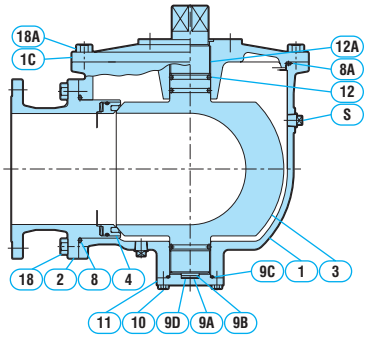
Items		Specification
Nominal Size (DN)		25 to 300
Connection		Flange Type JIS10K (✻1), Class (ASME, JPI) 150 (✻2)
Max. Working Pressure		1.4 MPa
Max. Working Temperature		150°C
Materials	Body	Body SCS13A, FCD400 (DN65 or more), SCS14A✤, SCS16A✤
	Ball	SCS13A, SCS14A✤, SCS16A✤
	Seat	Reinforced PTFE (CF), Semi-metal Seat (SM)✤, Metal Seat (ST)✤
Operation	Manual	Lever (up to DN150), Gear (DN200 or more)
	Automatic	Pneumatical (double acting only), Electrical, Hydraulic

✤**Option:** ***1.*** Body Material: SCS14A, SCS16A
2. Hardening is treated on ball surface for semi-metal and metal seat.
✻1: JIS B2220 ✻2: ASME B16.5

Parts and Materials



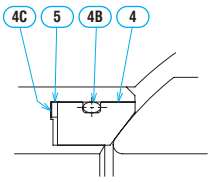
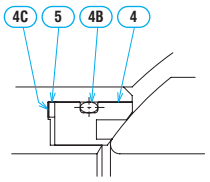
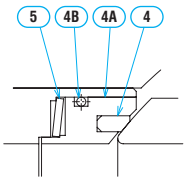
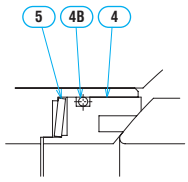
DN25～150



DN200～300

	Parts	Material	Remarks
1	Body	SCS13A	
1C	Body Cover	SCS13A	
2	Body Connector	SCS13A	
3	Ball	SCS13A	
		SCS13A & Surface hardening	for SM, ST Seat
4	Seat	Refer to Seat Details described below	
4A	Seat Retainer (CFRS)	Refer to Seat Details described below	
4B	O-Ring	Refer to Seat Details described below	
4C	Shim	Refer to Seat Details described below	
5	Seat Spring	Refer to Seat Details described below	
8	O-Ring	NBR (FKM) ✻	
8A	O-Ring	NBR (FKM) ✻	
9A	Pivot	SUS304	DN200 to 300
9B	Thrust Washer	Reinforced PTFE	DN200 to 300
9C	O-Ring	NBR (FKM) ✻	DN200 to 300
9D	Shim	SUS316	DN200 to 300
10	Bolt	SUS304	DN200 to 300
11	Trunnion Cover	SUS304	DN200 to 300
12	O-Ring	NBR (FKM) ✻	
12A	Bearing	SUS316 & Reinforced PTFE	
18	Bolt	SUS304	
18A	Bolt	SUS304	
S	Plug	SUS304	

Seat Details

	DN25 to 100		DN125 to 300	
	NTF, CF, GR	SM	CFRS, GRRS	SM
Sketch				

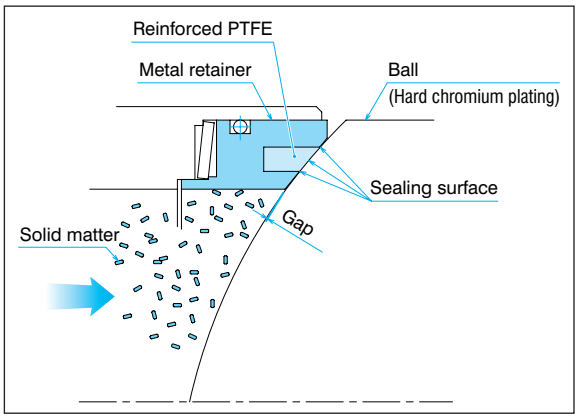
	Parts	Material			
4	Seat	Reinforced PTFE	SUS & Reinforced PTFE	Reinforced PTFE	SUS & Reinforced PTFE
4A	Seat Retainer	—	—	SUS304	—
4B	O-Ring	NBR, FKM ✻	NBR, FKM ✻	NBR, FKM ✻	NBR, FKM ✻
4C	Shim	SUS316	SUS316	—	—
5	Seat Spring	Silicone Rubber, FKM	Silicone Rubber, FKM	SUS329J4L	SUS329J4L

✻ O-Rings are of FKM (fluororubber) when fluid temperature is more than 80°C

Sealing Mechanism of SM (Semi-metal Seat)

Semi-metal seat has a structure that reinforced PTFE (CF: with carbon fiber, GR: with glass fiber) is inserted into metal retainer by hydraulic press and the gap between ball and metal retainer is designed to be minimum. (For CFRS and GRRS, reinforced PTFE is inserted by hand.)
Therefore, solid matter in fluid can be blocked to enter into seal surface directly. In addition, even if a metal touch condition happens, the better sealing than normal metal touch condition can be maintained by metal-PTFE-metal triple seal.
Hard chromium plating is provided on the surface of ball considering abrasion resistance so that long lifetime can be attained without galling between ball and seat.

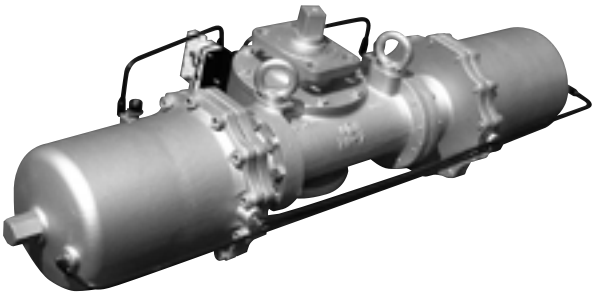
Records of Main Fluid: Corks powder, Resin pellet, CWM slurry



WN Type Pneumatic Actuator

Features

This actuator has been developed exclusively for 3-Way Ball Valve of which rotation angle is 135 degrees.
The actuator provides stable operation by applying simple rack and pinion design.
Maximum operating pressure is 0.7MPa.



Specification

Code	Cylinder Volume (l)	Air Consumption (Nl) (Operating press 0.4MPa)	Mass (kg)	Specification
WN-1N	0.94	4.6	11	● Maximum Operating Pressure: 0.7MPa ● Ambient Temperature: -10 to 60°C ● Rotation Angle: 135° ● Bore Size:Bore Size: Rc1/4 (WN-1N to WN-4N) Rc3/8 (WN-5N to WN-7N) ● Painting: Silver (conforming to RoHS)
WN-2N	2.2	10.8	18	
WN-3N	4.4	22	28	
WN-4N	8.0	40	47	
WN-5N	17	84	86	
WN-6N	33	162	156	
WN-7N	58	282	256	

Actuator Selection Table

Unit: mm

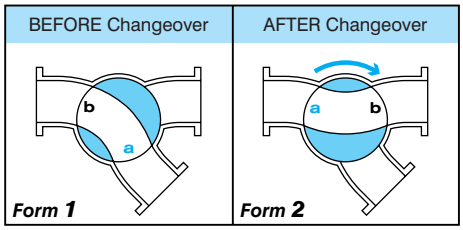
DN	Rank	Actuator Code	
		Pneumatic	Operating
25	B	WN-1N	Lever
	C		
40	B		
	C	WN-2N	
50	B		
	C	WN-3N	
65	B	WN-2N	
	C	WN-3N	
80	B		
	C	WN-4N	
100	B		
	C	WN-5N	
125	B		
	C		Gear
150	B		Lever
	C	WN-6N	Gear
200	B		
	C	WN-7N	
250	B		
	C		
300	B		
	C	WN-7N (Operating Pressure 0.6MPa)	

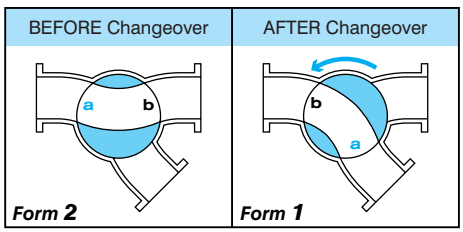
Selection by Operating Condition (Rank)

Rank	Seat	Fluid (Example)
B	CF, CFRS	Oil, Sludge, Viscous Fluid (up to 500CP), Powder (Soft, not including solid matter)
C	SM	Powder (Hard/Soft, including solid matter), Slurry, High viscous fluid (Gum)

Operation Form (Example)

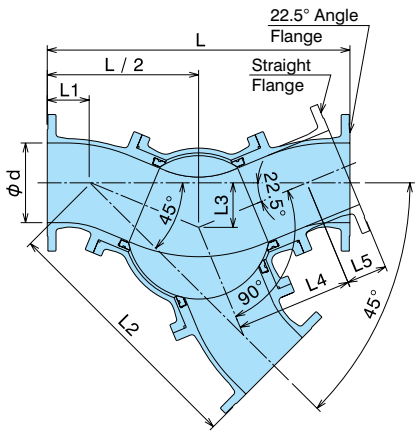
Arrow direction below shows the movement from the position before changeover.





Dimension

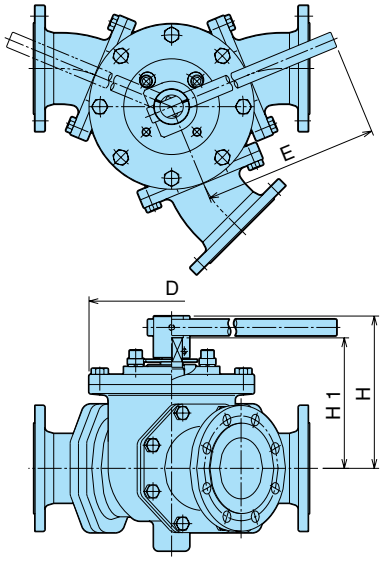
Base Dimension



Unit: mm

DN	d	L	L1	L2	L3	L4	L5
25	25	230	50	180	27	70.4	44.6
40	38	250	51	199	31	80.1	44.9
50	51	280	56	224	35	90.9	49.1
65	64	320		264	43	112.6	47.4
80	76	360	69	291	46	120.1	59.9
100	102	460	76	384	64	166.7	63.3
125	127	530	84	446	75	195.9	44.1
150	151	580	73	507	90	234.9	30.1
200	200	760	110	650	111	292.2	47.8
250	249	800	86	714	130	339.7	60.3
300	298	1000	102	898	165	431.2	68.8

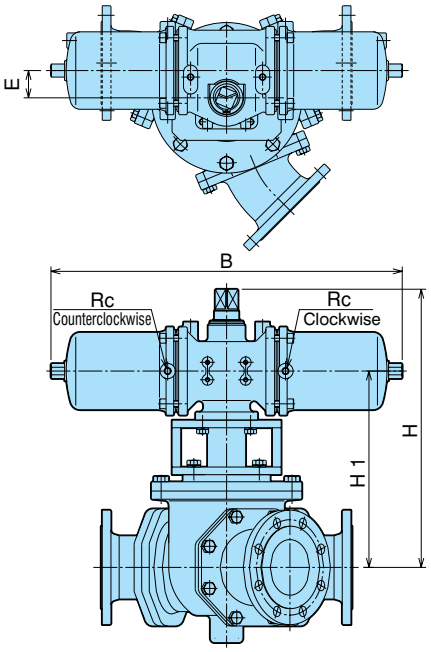
Manually Operated Valve Dimension



Unit: mm

DN	D	H	H1	E
25	100	122	—	250
40	130	152	—	350
50	156	163	—	350
65	190	198	—	670
80	212	212	—	670
100	276	255	—	970
125	320	271	—	1350
150	366	292	—	1350
200	476	—	328	—
250	534	—	393	—
300	634	—	422	—

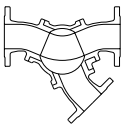
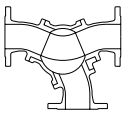
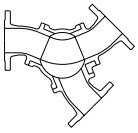
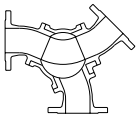
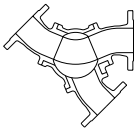
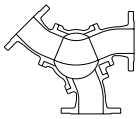
Pneumatically Operated Valve Dimension



Unit: mm

DN	Actuator Code	H	H1	B	E	Rc
25	WN-1N	246	171	464	31	1/4
40	WN-1N	271	196			
	WN-2N	316	216	520	39	
50	WN-2N	327	227			
	WN-3N	346	239	624	45	
65	WN-2N	348	248	520	39	
	WN-3N	373	266	624	45	
80	WN-3N	386	279			
	WN-4N	430	300	828	65	
100	WN-4N	484	354			
	WN-5N	520	380	916	72	3/8
125	WN-5N	542	402			
150	WN-5N	563	423			
	WN-6N	674	440	1204	90	
200	WN-6N	742	508			
	WN-7N	773	530	1558	122	
250	WN-7N	844	601			
300	WN-7N	874	631			

Pattern (Flange Application Model)

No.	01	02	03	04	05	06
Combination						
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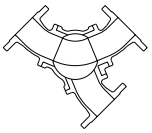
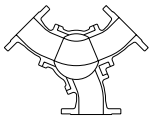
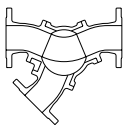
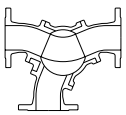
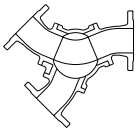
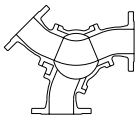
Combination						
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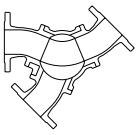
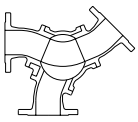
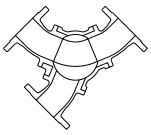
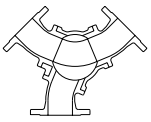
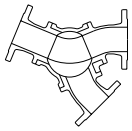
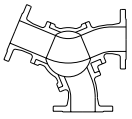
Combination						
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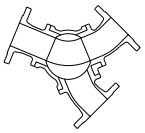
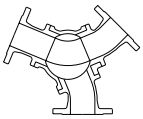
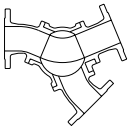
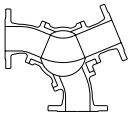
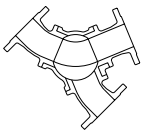
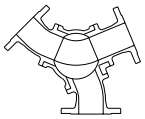
Combination						
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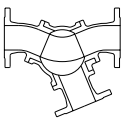
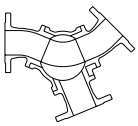
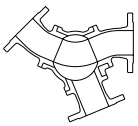
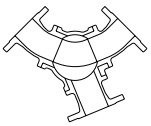
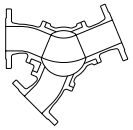
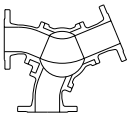
Combination						
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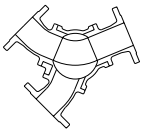
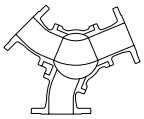
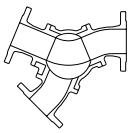
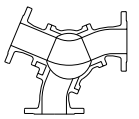
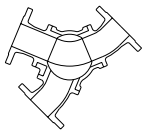
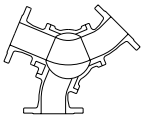
Combination						
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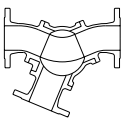
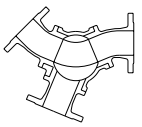
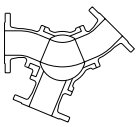
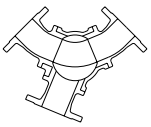
Combination						
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Combination						
No.	49	50	51	52	53	54
Combination						

6-3 Ball Valve for Shield Tunneling Method

Features

- Valves for Shield Tunneling Method have abundant supply records.
- Compact and robust design.
- Lever, Gear, Ratchet lever, Hydraulic and Pneumatic operation are applicable.

Specification

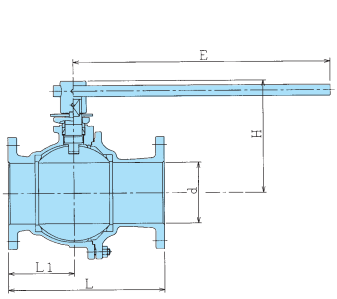
Manual Operation Type

Type	Lever		Gear		Ratchet Lever	
Ball	Floating		Floating	Trunnion	Floating	Trunnion
Valve Code	F104NB	ET101N	ETGH101N	EKTGJ101N	ETGRH101N	EKTGRH101N
DN	DN65 to100	DN125 to 200	DN125 to 200	DN250 to 350	DN125 to 200	DN250 to 350
Materials	Body: FC200 (FCD400 for up to DN100)					
	Ball: SCS13 (Hard chromium plating)					
	Seat: Reinforced PTFE					

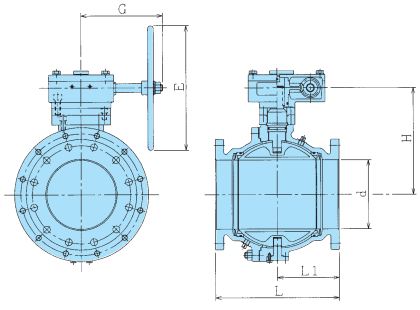
Automatic Operation Type

Type	Hydraulic			Pneumatic
Ball	Floating		Trunnion	Trunnion
Valve Code	FTON1104NB	ETON1101N	EKTON1101N	EKTPN1101N
DN	DN65 to 100	DN125 to 200	DN200 to 350	DN200 to 350
Operating Pressure	21 MPa			0.4 to 0.7 MPa
Materials	Body: FC200 (FCD400 for up to DN100)			
	Ball: SCS13 (Hard chromium plating)			
	Seat: Reinforced PTFE			

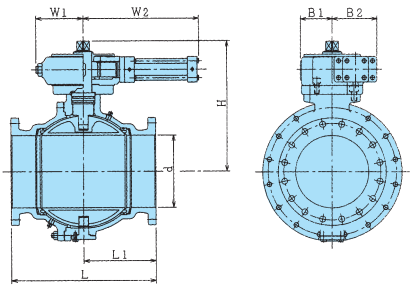
Dimension



F100NB



EKTGJ100N



EKTON1100N

Unit: mm

Nominal size DN	d	L	L1	Lever E	Lever H	Lever Mass (kg)	Gear E	Gear G	Gear H	Gear Mass (kg)	Hydraulic W1	Hydraulic W2	Hydraulic B1	Hydraulic B2	Hydraulic H	Hydraulic Mass (kg)
65	64	190	87	350	135	13.5	—	—	—	—	108	272	74	110	211	25.0
80	76	203	97		145	16.5	—	—	—	—					221	28.0
100	102	229	115	450	180	27.0	—	—	—	—					248	38.5
125	127	290	145	650	260	57.0	280	160	250	84.0	153	379	106	148	304	80.0
150	152	330	165		280	72.0			270	98.0					324	96.0
200	203	400	200	800	350	110.0	315	200	325	147.0					377	143.0
250	250	450	225	—	—	—	450	295	385	280.0	195	458	130	184	464	260.0
300	300	600	300	—	—	—	560	375	415	430.0					541	390.0
350	335	700	350	—	—	—			440	620.0	225	528	160	202	566	640.0

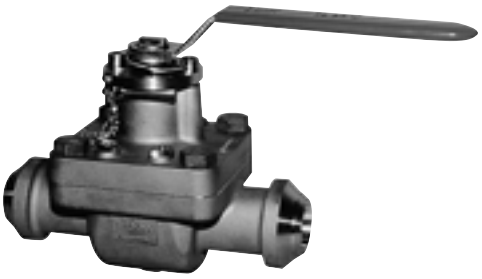
6-4 Top Entry Ball Valve (T100S/H)

Features

Top entry type is that ball and seat can be taken out from the top of the valve. Welding connection is possible and the maintenance is easy. The valve is suitable for hazardous fluid or precious fluid of which leakage to the outside is not allowed.

Specification

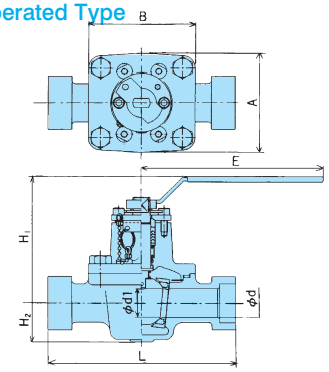
		Valve Type T100S	Valve Type T100H
Nominal Size (DN)		8 to 100	
Pressure Class		CL150	CL300
Connection		SW (Socket Weld), BW (Butt Weld)	
Max. Working Pressure		1.4 MPa	2.1 MPa
Max. Working Temperature		100°C	150°C
Materials	Body	SCS13A, SCS14A, SCS16A, SCS19A	
	Ball	SUS304	
	Seat	PTFE	Reinforced PTFE
	Packing	Reinforced PTFE	
		FKM (O-Ring)	FKM or Perfluorogum (O-Ring)
	Gasket	SUS304 & Expanded graphite (Spiral wound type)	



T100S Lever Operated Type

Dimension

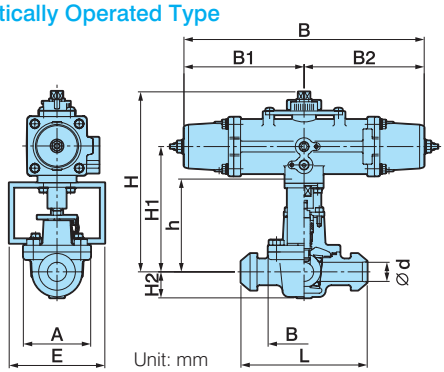
T100S Lever Operated Type

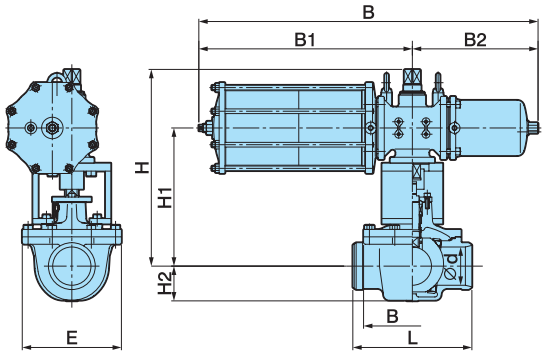


Unit: mm

DN	d	L	H1	H2	A	B	E	Mass (kg)
8	8	108	75	20	52	56	100	0.9
10	10							
15	13		95	23	65	68	130	
20	19	117	99	26	69	71		1.3
25	25	165	114	32	86	90	160	2.8
40	38		148	42	116	119	230	6.8
50	51	216	158	53	177	157		11.0
65	64	241	169	63	187	184	350	15.0
80	74	283	172	73	208	206		21.0
100	98	305	223	95	256	252	450	35.0

T100H Pneumatically Operated Type





Unit: mm

DN	d	L	H	H1	H2	A	B	E	h	Actuator Code	C	W	W1	W2	Mass (kg)
8	8	108	176	122	20	52	56	70	93	PO-04D	212	—	—	—	2.5
10	10											—	—	—	
15	13		193	133	23	65	68	80	108	PO-05D	268	—	—	—	3.9
20	19	117	210	142	26	69	71		120	PO-06D	314	—	—	—	5.9
25	25	165	233	165	32	86	90	100	103			—	—	—	7.0
40	38		286	209	42	116	119	130	151	PO-08D	392	—	—	—	20.0
50	51	216	338	239	53	177	157		156	PO-10D	500	—	—	—	28.0
65	64	241	393	280	63	187	184	160	241	PO-12D	634	—	—	—	46.0
80	74	283	403	290	73	208	206		233			—	—	—	52.0
100	98	305	510	360	95	256	256	252	—	PO-13D	—	869	547	322	115.0

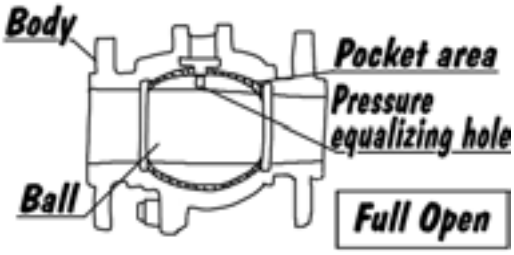
7

Safety Instructions

Safety Instructions

1. Selection of Valves

1. Usable ranges for products described on this brochure are limited according to the domestic/international code and standard and NDV standard. Appropriate products must be selected after confirming the usage conditions (fluid, pressure, temperature etc.).
2. Materials for the main parts of valves must be selected properly considering working conditions (fluid, temperature etc.).
3. Please specify degrease or water proof when issuing order. (Some of the products may not be applicable for degrease or water proof.)
4. Soft seat floating ball valve must be used at full open/close position. Usage at intermediate position may cause damages of the surface of ball and/or seat.
5. Because of the structure of ball valve, abnormal pressure rise at pocket (✻) occurs if the fluid is liquid and the temperature fluctuates. Ball top is provided with a hole to prevent this abnormal pressure rise. The alternative countermeasure should be taken incase the abnormal pressure rise happens by temperature rise at the pocket during valve full closing. Please consult with NDV or local representative if the case occurs.



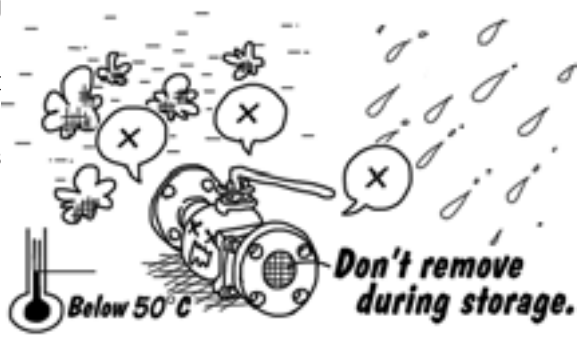
   ✻ During valve full OPEN: Space between ball and shell
   During valve full CLOSE: Space between ball and shell, Ball bore portion
6. Floating ball valve has a mechanism to seal by pushing ball against the seat of the outlet side with fluid pressure. Please consult with NDV or local representative in case that the pressure change is large in operation condition because seat leakage may occur at low pressure operation.
7. Please consult with NDV or local representative in case that fluid includes abrasive matter because an abrasion may occur at seat, body or other parts of valve.

2. Receipt and Carriage

1. Wrapping and packing conditions, products condition and number of goods must be checked and confirmed at the time of the receipt.
2. Delivered goods may be heavy depending on the bore size. Unloading and carriage must be done using proper machines and tools according to the relevant law for safety and health. Do not go under lifted goods, do not insert hand or leg below goods and do not operate lifting machine under the lifted goods.
3. If packing is by corrugated board, the packing strength will become low when wetted. Handling must be carefully done if the corrugated board is wet.

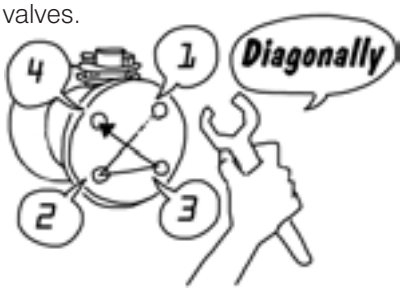
3. Storage

1. It is recommended to store products under packing condition until installing them to piping.
2. If products are stored for some time after unpacking, dust proof seal (cap) at flange face must not be removed.
3. Products must be stored under below mentioned conditions in order to avoid rust and/or degradation of materials.
   1. To protect from rain or water
   2. Ambient temperature must be below 50°C
   (The temperature might be different by installed accessories.)
   3. To avoid high humidity and dust atmosphere



4. Installation to Piping

1. Remove dust proof seal (cap) at connection flange face and confirm that there are no dusts and/or deposits inside. Confirm also that there are no foreign materials inside of the piping after cleaning. Blow off by air or flush by fluid if necessary.
2. Ball valves have not a restriction for the flow direction. Install valves to piping considering the position of operation handle and the other necessary issues for safety operation. If flow direction is marked on the valve for some reason such as a protection of abnormal pressure rise, install as directed by the mark.
3. Keep a space for overhauling. The space needs necessary area for lifting a complete set of the valve.
4. Valves are delivered at full open position unless otherwise specified. Install valves keeping full open position.
5. Install valves avoiding strong tension, compression or bending stress to the valves.
6. When installing valves, bolts for installation must be tightened diagonally and equally. Unbalanced tightening may cause leakages from connection flanges.
7. Confirm that tightening bolts and nuts are not loosened. Retighten them if loosened.
8. After installing valves, blowing off by air or flushing by fluid at full open valve condition must be done to clean foreign materials in piping. (Do not close and open valve during blowing off or flushing.)



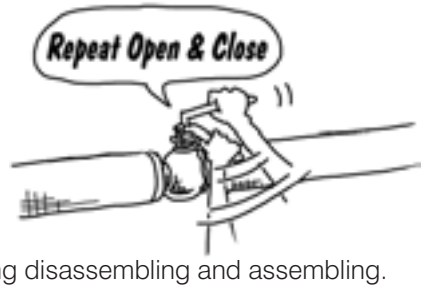
5. Operation

1. Do not operate valve with excessive torque by attaching a pipe or a wrench to the lever handle for opening or closing.
2. Never put fingers or hands into the inside of valve.
3. If there is any leakage from the gland, tighten further the gland bolt. If valve is used for fluid of large temperature change, degree of stress relief of packing is large and therefore, retightening must be done after the temperature once becomes high and falls to low.
4. Products may be damaged if remaining fluid in the valve is frozen. If there is a possibility of frozen, heat piping line or clean the inside of valves.

6. Pneumatical and Electrical Actuator

1. Air vent and electric wiring terminal are fitted with seals. Do not remove the seals until installation to the connections.
2. Actuators are delivered after adjustment. Do not disassemble or readjustment. Call NDV or local representative, if some adjustment seems necessary.
3. Use air dehumidified and cleaned by filtration.
4. Operating pressure and power source must be confirmed by the plate attached to the valve and/or the specification.
5. Take care that rain or water will not enter from air hole of the actuator.

7. Disassembling and assembling



1. Before remove a valve from piping, discharge the fluid in the piping and relieve the pressure. In this occasion, the valve must be opened and closed several times to relieve the pressure in the valve. Special attention must be given if the fluid is hazardous like poisonous or abrasive fluid.
2. Be careful not to damage the seal part of ball surface and flange face during disassembling and assembling.

Memo

● The ISO 9001 · 14001 certificate was awarded

ISO9001 99QR·167
ISO14001 08ER·701

⚠ CAUTION

Specifications and performance figures of products contained in this catalog are on the design calculations, in-house tests, actual records of product application, and the official standards and specifications. They are presented as the user guide on the use of product concerned under general service conditions. Users intending to use the product under a special condition are required to receive engineering advice from this company in advance or to make their own studies and evaluation to verify performance on their own responsibility. This company shall not be liable for any damages, material or human, that may arise without following this procedure. In as much as full care was taken in editing this catalog, users are kindly requested to make contact with this company for any questions or discrepancies found. This catalog is subject to change without notice for the purpose of correcting error, supplementing or improving insufficient content, updating the content to the improved product performance, design change, discontinuation of product and other reasons. Revised version automatically invalidates catalogs issued prior to the current version. Check the version with our Sales Dept. or local representative before you place orders.

⚠ WARNING　　⚠ CAUTION

There are several points to be noticed for the use of ball valve based on the structural characteristics. When valve is delivered, a leaflet for Safety Instructions is in the package. Please read this instruction thoroughly before handling and use of products in order to use them safely and stably for a long time.

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