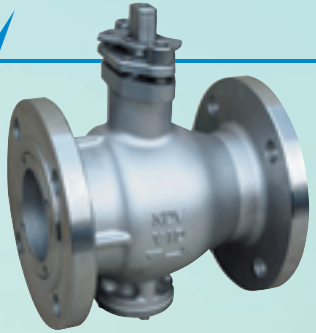
Catalog No. **BE302-04**

NDV BALL VALVES

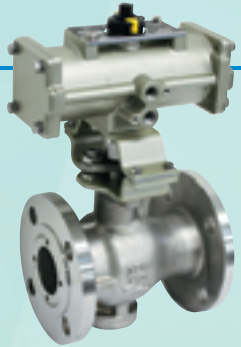
NIPPON DAIYA VALVE Co., Ltd.

V-Port Valve



Lever Operated Valve

V100ND (NC)

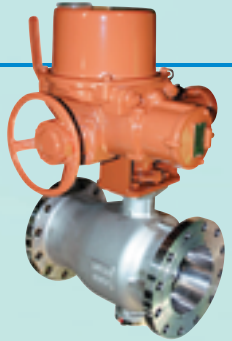


Pneumatically Operated ON-OFF Valve

VPN1100ND (NC)

Pneumatically Operated ON-OFF Valve

VPN3100ND (NC)



Electrically Operated Valve

VMS4100ND (NC)

Contents

3

V-Port Valve

Structure and Feature of V-Port Valve

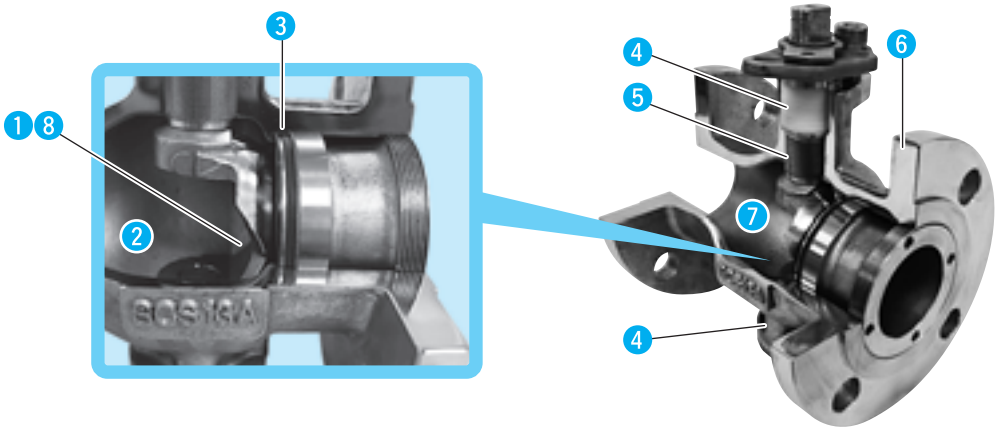
Reference for Seat Selection

3. V-Port Valve: V100ND(NC)

Structure and Feature of V-Port Valve

Structure and Features

V-Port Valve is the most suitable for resin pellet (nylon etc.), powder (fly ash etc.), paper mill (pulp fluid), slurry (steel mill, muddy water, lime milk etc.) and any other high viscous fluid.
The valve has high performance for heat resistance, abrasion resistance and flow control.




Ball

❶ V-Cut Ball

The valve is effective to cut cellulose or solid matter by V shaped opening of the half-sphere ball.
The valve is superior for abrasion resistance by stelite applied to seat side and lapping applied surface of ball. (note; For soft seta , hard chrome plated.)

❷ Pocketless Structure

Since seat is located at inlet side only, congestion of fluid or clogging between ball and body will not occur. By this seal configuration, abnormal pressure rise will not occur too.

❸ Seat with Heat Resistance and Abrasion Resistance

The seat has both rigidity and flexibility, therefore, it can seal from vacuum to high pressure without an influence by temperature and/or pressure difference. The valve is usable in high temperature if metal seat is applied. The seat has high abrasion resistance against abrasive fluid such as slurry and powder. (The details about the seat are described in the next page.)

❹ Stable Bearing Configuration

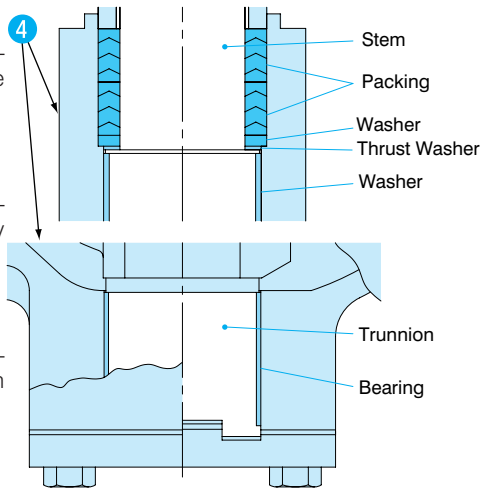
Reinforced PTFE is applied to bearings for stem and trunnion and therefore, the operation torque is low and the frequent operation is possible.

❺ Gland Packing with Superior Sealing

Perfect sealing is possible from vacuum condition to high pressure condition by applying V-Packing. (V100ND)

❻ Integrated Body

The valve body is an all integrated body. Therefore, there are no fluctuations in torque by piping stress, no deterioration of sealing or no external leakage.



❼ Full Flow

When the valve is fully opened, the flow passage is almost straight, minimizing pressure loss and ensuring a full capacity flow. Slurry or high viscous fluids can flow the passage smoothly without congestion or cavitation.

❽ Flow Control

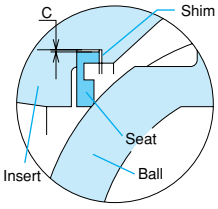
The V-shaped cut ball increases rangeability and enhance flow rate control ability. The flow characteristics are almost equal percentage.

Reference for Seat Selection

Seat Specification and Features (V100ND)

- **Solid (thick) Seat**, **Thin Seat** and **Soft (Reinforced PTFE) Seat** are available for wide range purposes.
- The above three kinds of seats are compatible.
- Outer diameter has a clearance C. By placing the seat on the spherical surface of the ball, seal surface of the seat becomes centripetal and equal contact can be obtained.

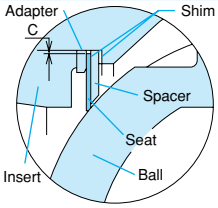
Solid (thick) Seat (Code: ST)



SUS316 (Stellite at seal surface). When the insert is tightened, a notch at the backside of the seat makes cantilever action and seal surface of the seat adheres to the surface of the ball.

Application: resin pellet, powder, slurry, high viscous fluid

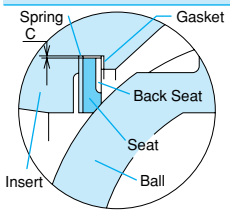
Thin Seat (Code: M)



Thin spring plate of SUS316H. The principle of the seal is cantilever as same as the solid seat.
However, since the flexibility is better, the leakage tolerance and the torque of the valve can be minimized than the solid seat.

Application: cellulose fluid, viscous fluid, sludge

Soft Seat (Code: CF)



Carbonfiber reinforced PTFE. Since the seat spring acts as cantilever, more stable sealing than thin seat can be obtainable.

Application: water, oil, air, for on-off control of clean fluid

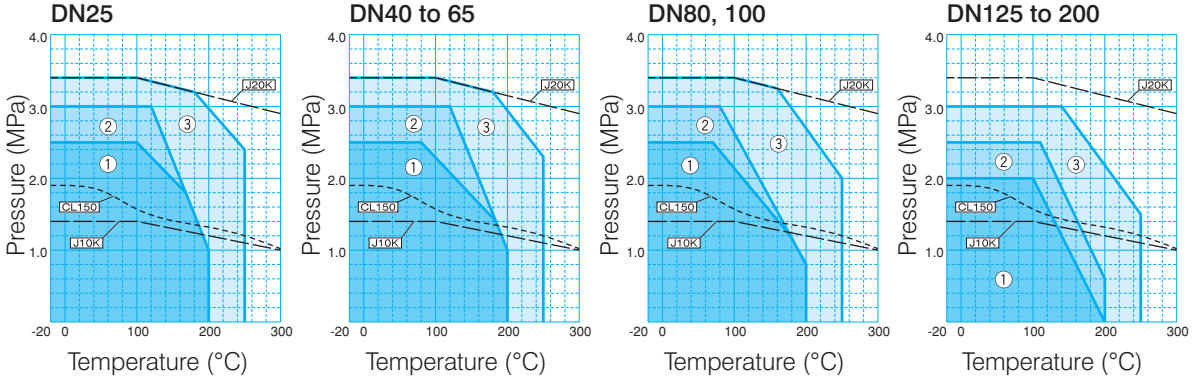
Allowable Seat Leakage

Kind of Seat	Allowable Leakage	Applicable Code
Solid Seat (ST)	0.5% of rated Cv	ANSI B16.104 Class II and IEC534-4 Class II
Thin Seat (M)	0.0005% of rated Cv	ANSI B16.104 Class IV 1/20 and IEC534-4 Class IV-S1
Soft Seat (CF)	Zero leakage	—

Remark: Solid seat with allowable leakage of 0.002% is also available.

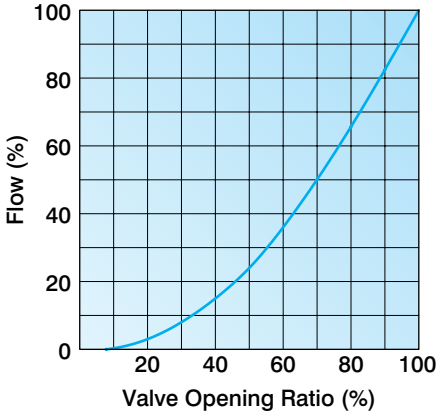
Working Pressure and Temperature Range

CF: ①
M : ②
ST: ③



✻ DN125 to 200 is V100NC.

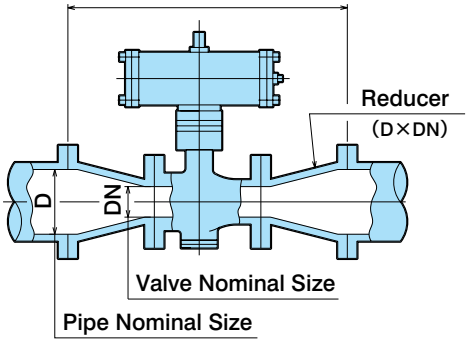
Flow Characteristics



Flow Coefficient Cv Value (Adjusted Cv value considering rated Cv and effects by reducer)

DN	Rated Cv	D×DN	Adjusted Cv	D×DN	Adjusted Cv	D×DN	Adjusted Cv
25	28	40×25	23	50×25	21	65×25	20
40	75	50×40	68	65×40	60	80×40	55
50	153	65×50	127	80×50	110	100×50	95
65	250	80×65	218	100×65	185	125×65	165
80	350	100×80	312	125×80	270	150×80	245
100	540	125×100	480	150×100	430	200×100	360
125	930	150×125	835	200×125	675	250×125	575
150	1320	200×150	1110	250×150	950	300×150	830
200	2000	250×200	1800	300×200	1620	350×200	1500

Adjusted Cv based on the reducer type



Cv value Calculation

Fluid		Formula
Liquid	General	$C_V=11.56V\sqrt{\frac{G}{(P_1-P_2)}}$
	Viscous Fluid	$C_V=11.56V\cdot R\cdot\sqrt{\frac{G}{(P_1-P_2)}}$
Gas	$\Delta P<\frac{P_1}{2}$	$C_V=\frac{Q}{2.93}\sqrt{\frac{G(273+t)}{\Delta P(P_1+P_2)}}$
	$\Delta P\geq\frac{P_1}{2}$	$C_V=\frac{Q\sqrt{G(273+t)}}{2.538P_1}$
Steam	$\Delta P<\frac{P_1}{2}$	$C_V=\frac{WK}{0.1391\sqrt{\Delta P(P_1+P_2)}}$
	$\Delta P\geq\frac{P_1}{2}$	$C_V=\frac{WK}{0.1205P_1}$

V: Maximum Flow (m³/hr)
G: Gravity (water: 1, air: 1)
P1: Valve inlet pressure (kPa·A)
P2: Valve outlet pressure (kPa·A)
ΔP: P1-P2 (kPa)
R: Viscosity correction factor
t: Temperature(°C)
Q: Maximum Flow (15.6°C, 101.3 kPa)
W: Maximum Flow (kg/hr)
K: 1+(0.0013 x Superheated value°C)

Superheated value:
Temperature difference (t-t1) between saturate temperature (t) in absolute pressure at valve inlet and temperature at valve inlet (t1).
For saturated steam, superheated value is assumed to be zero.

Pulp Density Correction Value

Density (%)	Correction Factor (K1)
1	1
2	1.1
3	1.2
4	1.4
5	1.9

Remarks:
1. Viscosity correction factor R will be applied when the fluid is more than 20cSt.
2. Pulp density correction will be calculated by multiplying Cv value with K1 (Viscous fluid formula to be used.)

3 V-Port Valve: V100ND

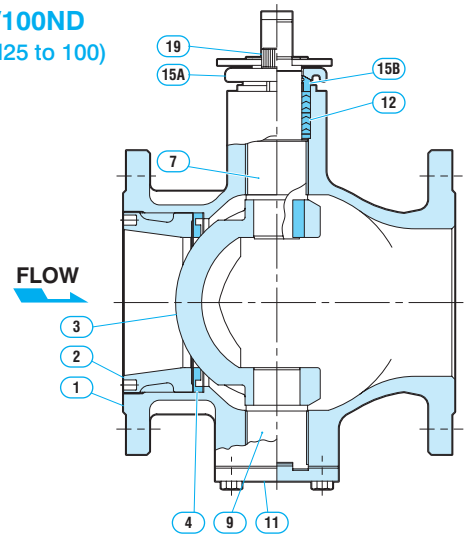
Specification

Type	V100ND	V100NC
Nominal Size (*1)	DN25 to 100	DN125 to 200
Face to Face Dimension	According to ISO5752	
Connection type	Flange type: JIS10K, 20K • Class (ASME, JPI) 150, 300	
Body Material (*2)	SCS13A (CF8) SCS14A (CF8M)	SCS13 SCS14
Ball Material / Seat Material	According to the combination of Ball and Seat	
Operation type	Lever, Gear, Pneumatical, Electrical	

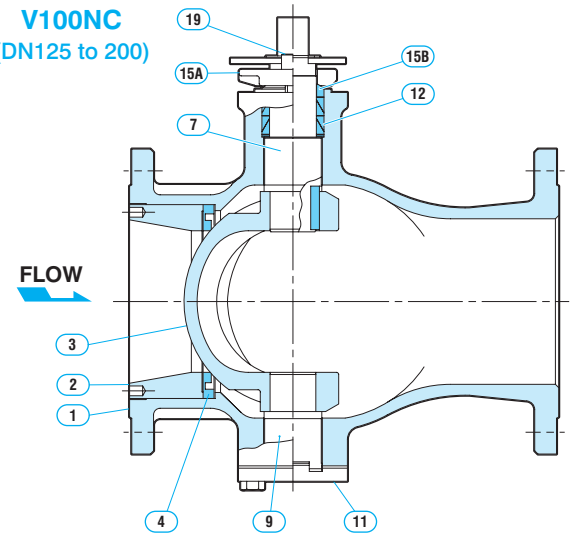
*1: DN20 and over 250 are also available.
*2: FCD is also available.

Parts and Materials

V100ND
(DN25 to 100)



V100NC
(DN125 to 200)



Parts		Material			
		V107ND	V107NC	V112ND	V112NC
1	Body	SCS13A	SCS13	SCS14A	SCS14
2	Insert	SCS13A	SUS304	SCS14A	SUS316
3	Ball	SCS11 (ST) SCS11 (Hcr.P)		SCS11 (ST) SCS11 (Hcr.P)	
4	Seat	SUS316 (ST) SUS316H (M) Reinforced PTFE (CF)		SUS316 (ST) SUS316H (M) Reinforced PTFE (CF)	
7	Stem	SUS316		SUS316	
9	Trunnion	SUS316		SUS316	
11	Trunnion Cover	SUS316		SUS316	
12	Packing	New-PTFE	PTFE	New-PTFE	PTFE
15A	Gland Flange	SCS13A	SCS13	SCS13A	SCS13
15B	Gland	SUS304		SUS304	
19	Cap Screw	SUS304		SUS304	

Combination of Ball and Seat

Type	V100ND, V100NC	
	Ball	Seat
Solid Seat (thick)	SCS11+ST	SUS316 + ST
Thin Seat	SCS11+Hcr.P	SUS316H
Soft Seat (Reinforced PTFE)		Reinforced PTFE(CF)

•ST: Stellite •Hcr.P: Hard chrome plating

Valve Codes

Valve Code for V100ND

V 1 0 7 N D - C F - 0 5 0 - J 1 0 K R F

① ✻ ② ③ ④

V100ND (NC) (V-Port Valve)

① Body Material

07	SCS13A
12	SCS14A

② Seat Material (Refer to P 29)

ST	Solid Seat
M	Thin Seat
CF	Soft Seat

③ Nominal Size (DN or A)

Conforming to ISO6708 and JIS B2001

④ Connection

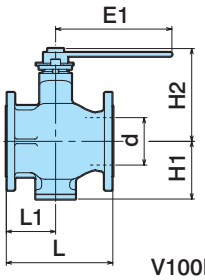
J10KRF	JIS 10KRF
J20KRF	JIS 20KRF
A150RF	ASME CL150

✻ Improvement Identification Code

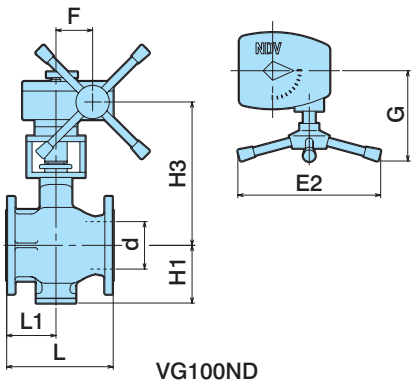
None	Original Design
N	First Improvement
NB	Second Improvement
NC	Third Improvement
ND	Fourth Improvement

Dimension

V100ND (NC) · VG100ND (NC)



V100ND



VG100ND

Unit: mm

Nominal size DN	d	L		L1	H1	H2	Lever Operated Valve E1		Gear Operated Valve H3								Mass (Approx. kg) Lever Operated		Gear Operated	
		10K CL150	20K				10K CL150	20K	10K CL150	20K	G 10K CL150	G 20K	F 10K CL150	F 20K	E2 10K CL150	E2 20K	10K CL150	20K	10K CL150	20K
25	25	127	165	55	48	108	160	160	—	—	—	—	—	—	—	—	3.8	5.0	—	—
40	38	165	190	70	71	135	230	230	—	—	—	—	—	—	—	—	6.8	8.5	—	—
50	51	178	216	75	77	140			—	—	—	—	—	—	—	—	8.1	10.5	—	—
65	64	190	241	80	96	163	350	350	—	—	—	—	—	—	—	—	13.0	15.5	—	—
80	76	203	283	90	101	168			—	—	—	—	—	—	—	—	14.0	17.0	—	—
100	102	229	305	106	131	209	450	450	311	316	165	190	62.5	77	240	300	21.0	26.5	38.0	49.0
125	127	356	381	145	163	295	650	800	378	378	190	230	77.0	90.5	300	460	44.0	50.0	77.0	81.0
150	152	394	403	150	173	307			388	388							55.0	64.0	90.0	95.0
200	203	457	502	200	211	368	800	1000	446	464	230	260	90.5	121	460		86.0	98.0	135.0	150.0

6

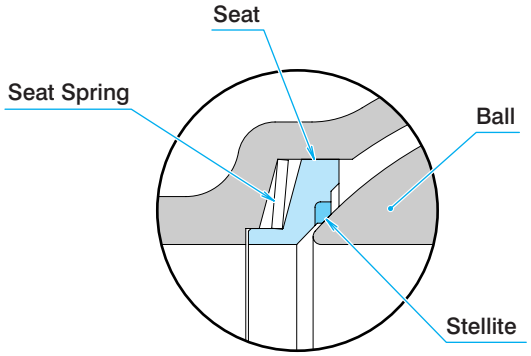
Special Purpose Ball Valve

6-1 High Temperature Ball Valve

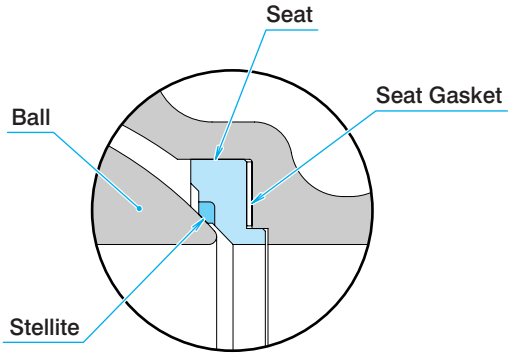
Metal Seat Ball Valve

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)

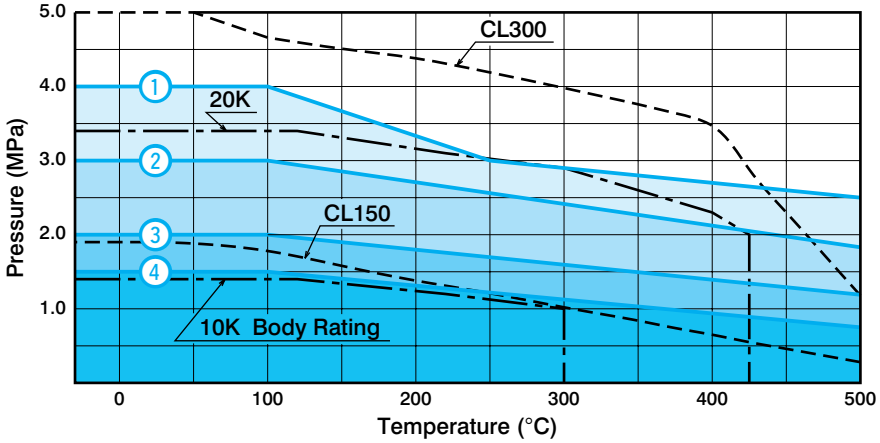
*1: JIS B2220 *2: ASME B16.5

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

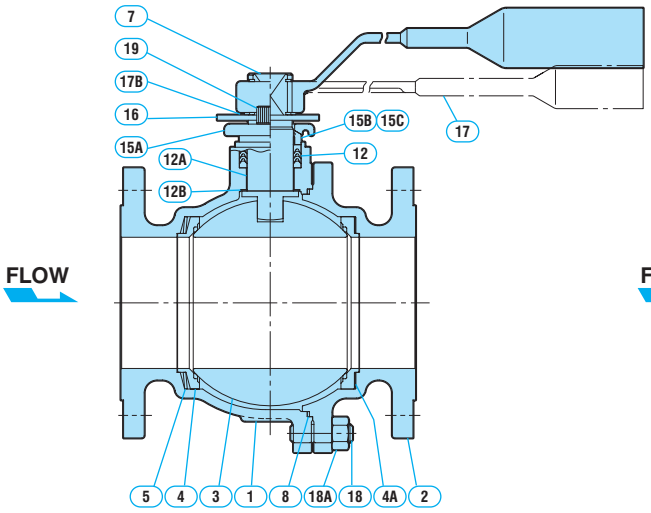
Allowable Leakage of hydraulic pressure is according to ASME B16.104 Class V.
Allowable leakage for air pressure is calculated by those for hydraulic pressure considering water and air leakage ratio written in *JIS B2003 General rules for inspection of valves.*

Working Pressure and Temperature Range

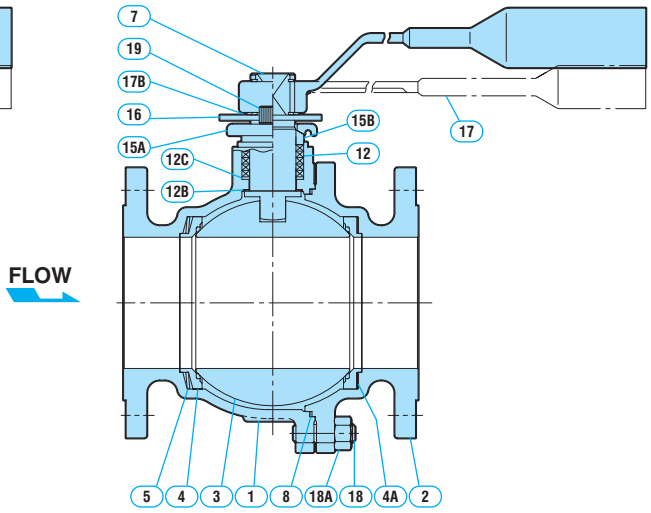


Dimension ①DN15 to 25 ②DN40 to 65 ③DN80, DN100 ④DN125 to 200

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	

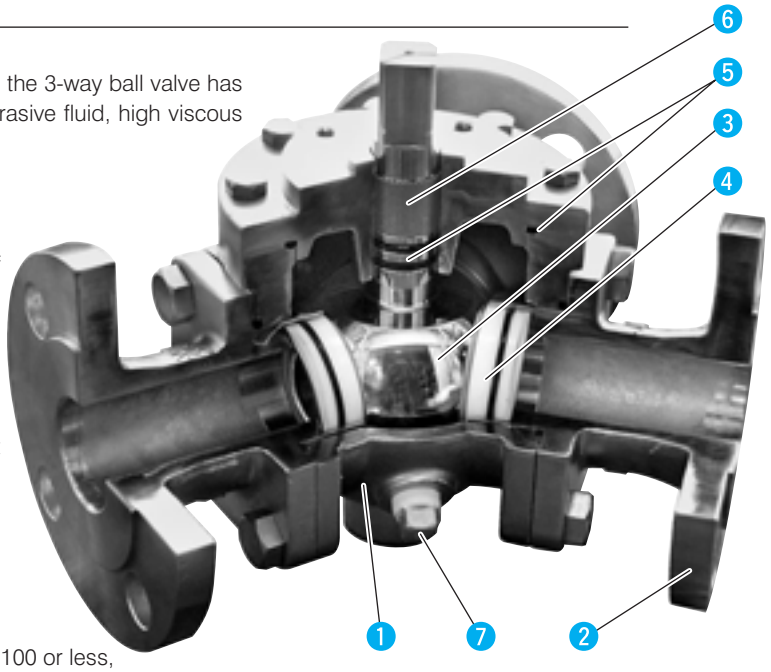
✻1: DN15 and DN20 are of SUS329J1 ✻2: 400°C is the maximum in oxidative atmosphere. ✻3: Inconel X750 for over 351°C

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.

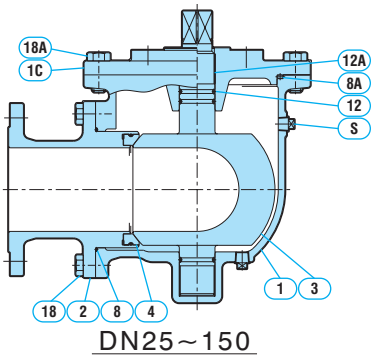
7 Purge hole
The body has two purge holes. They can be used for the prevention of fluid congestion by air charge, the leakage check for seat abrasion, and the purge of fluid remaining at pockets.

Specification

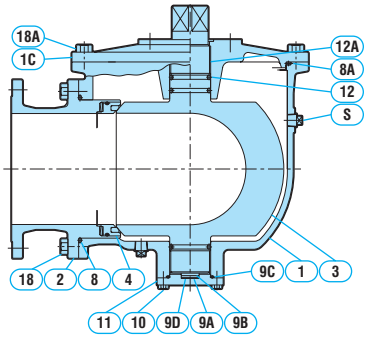
Items		Specification
Nominal Size (DN)		25 to 300
Connection		Flange Type JIS10K (✻1), Class (ASME, JPI) 150 (✻2)
Max. Working Pressure		1.4 MPa
Max. Working Temperature		150°C
Materials	Body	Body SCS13A, FCD400 (DN65 or more), SCS14A✤, SCS16A✤
	Ball	SCS13A, SCS14A✤, SCS16A✤
	Seat	Reinforced PTFE (CF), 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



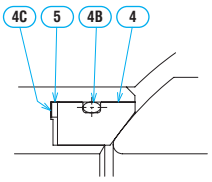
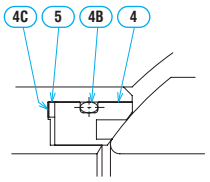
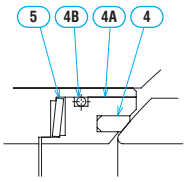
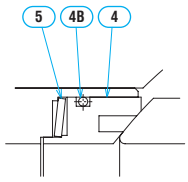
DN25～150



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				

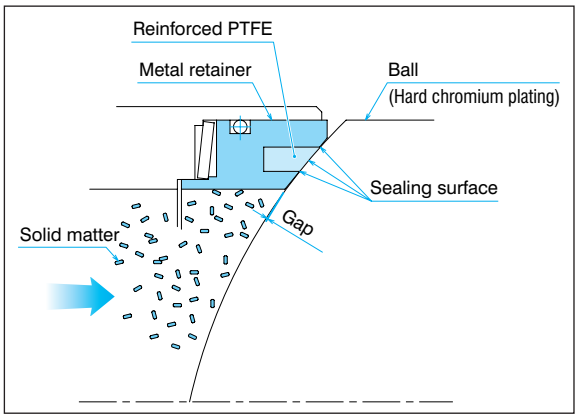
	Parts	Material			
4	Seat	Reinforced PTFE	SUS & Reinforced PTFE	Reinforced PTFE	SUS & Reinforced PTFE
4A	Seat Retainer	—	—	SUS304	—
4B	O-Ring	NBR, FKM ✻	NBR, FKM ✻	NBR, FKM ✻	NBR, FKM ✻
4C	Shim	SUS316	SUS316	—	—
5	Seat Spring	Silicone Rubber, FKM	Silicone Rubber, FKM	SUS329J4L	SUS329J4L

✻ 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.

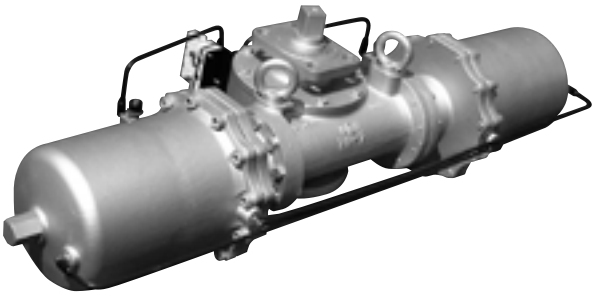
Records of Main Fluid: Corks powder, Resin pellet, CWM slurry



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

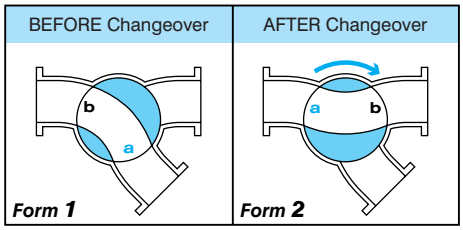
DN	Rank	Actuator Code	
		Pneumatic	Operating
25	B	WN-1N	Lever
	C		
40	B		
	C	WN-2N	
50	B		
	C	WN-3N	
65	B	WN-2N	
	C	WN-3N	
80	B		
	C	WN-4N	
100	B		
	C	WN-5N	
125	B		
	C		Gear
150	B		Lever
	C	WN-6N	Gear
200	B		
	C	WN-7N	
250	B		
	C		
300	B		
	C	WN-7N (Operating Pressure 0.6MPa)	

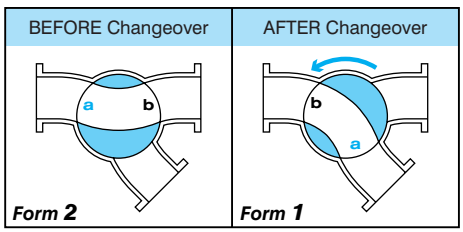
Selection by Operating Condition (Rank)

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)

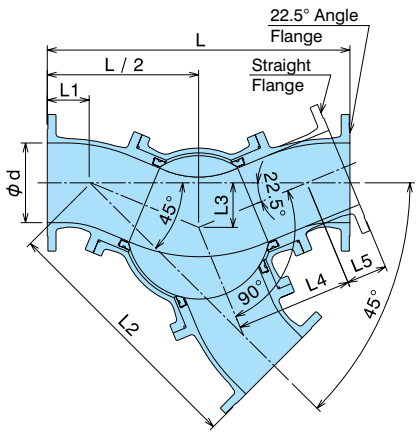
Arrow direction below shows the movement from the position before changeover.





Dimension

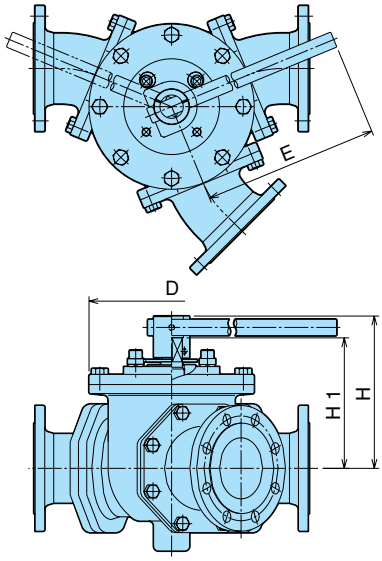
Base Dimension



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

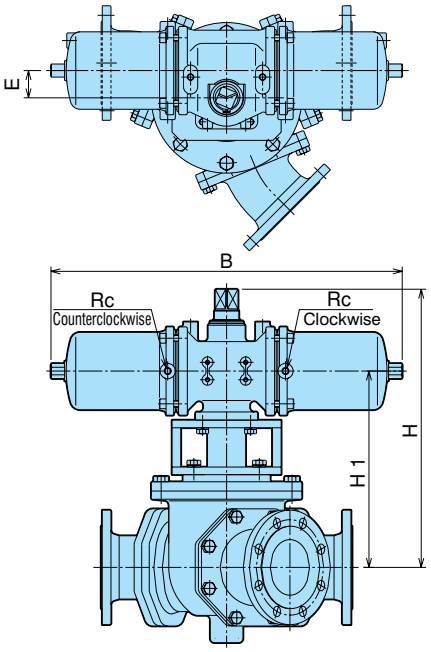
Manually Operated Valve Dimension



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	—

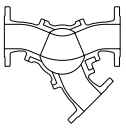
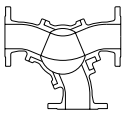
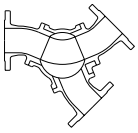
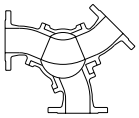
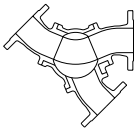
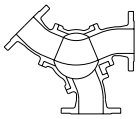
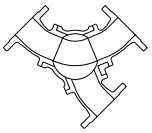
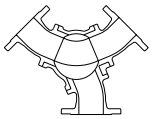
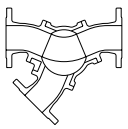
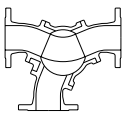
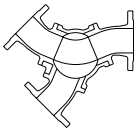
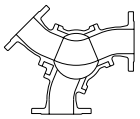
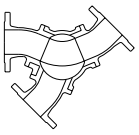
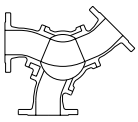
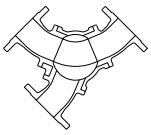
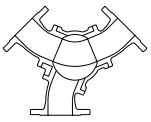
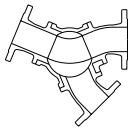
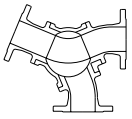
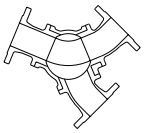
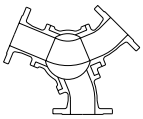
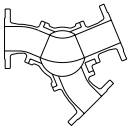
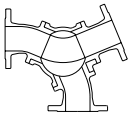
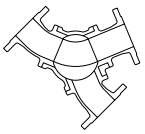
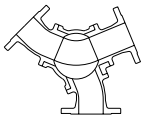
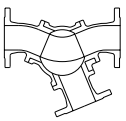
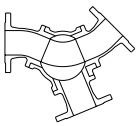
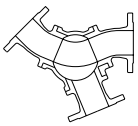
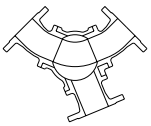
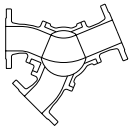
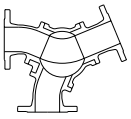
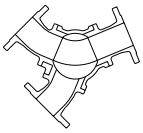
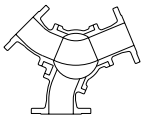
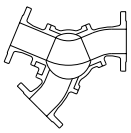
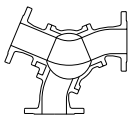
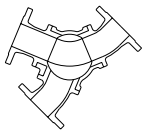
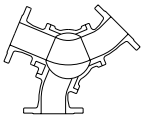
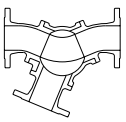
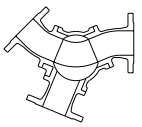
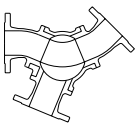
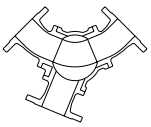
Pneumatically Operated Valve Dimension



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						
No.	07	08	09	10	11	12
Combination						
No.	13	14	15	16	17	18
Combination						
No.	19	20	21	22	23	24
Combination						
No.	25	26	27	28	29	30
Combination						
No.	31	32	33	34	35	36
Combination						
No.	37	38	39	40	41	42
Combination						
No.	43	44	45	46	47	48
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

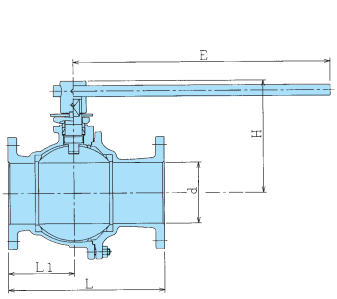
Manual Operation Type

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					

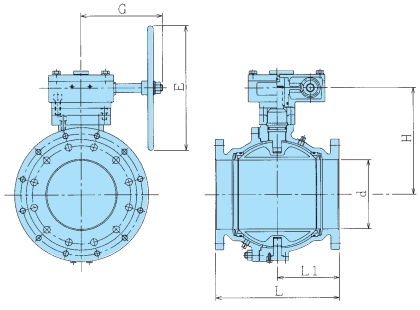
Automatic Operation Type

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			

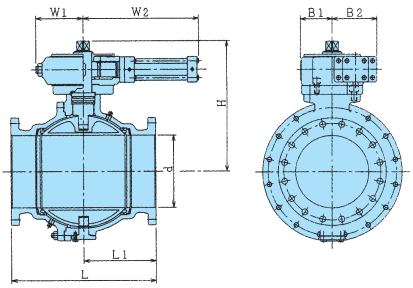
Dimension



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

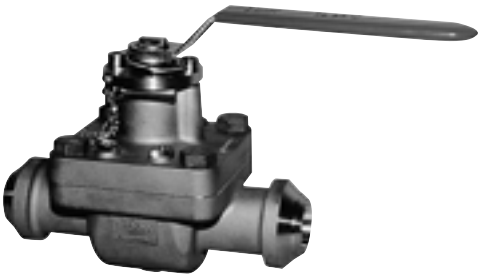
6-4 Top Entry Ball Valve (T100S/H)

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

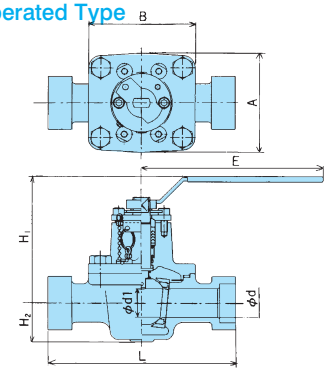
		Valve Type T100S	Valve Type T100H
Nominal Size (DN)		8 to 100	
Pressure Class		CL150	CL300
Connection		SW (Socket Weld), BW (Butt Weld)	
Max. Working Pressure		1.4 MPa	2.1 MPa
Max. Working Temperature		100°C	150°C
Materials	Body	SCS13A, SCS14A, SCS16A, SCS19A	
	Ball	SUS304	
	Seat	PTFE	Reinforced PTFE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



T100S Lever Operated Type

Dimension

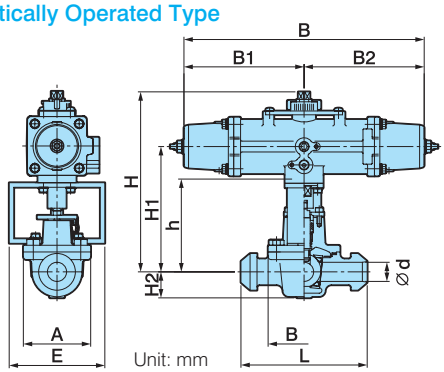
T100S Lever Operated Type

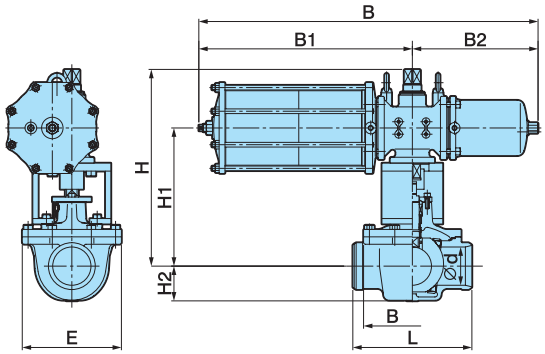


Unit: mm

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

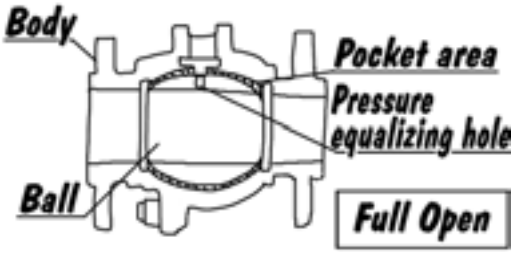
7

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.



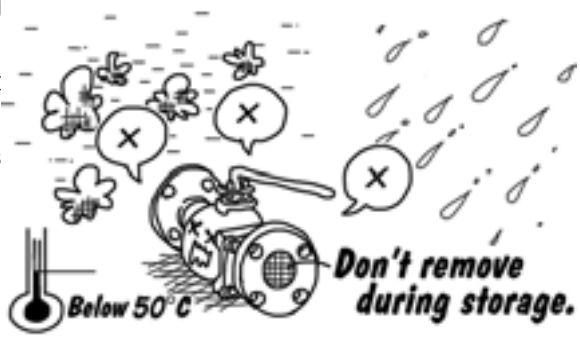
   ✻ During valve full OPEN: Space between ball and shell
   During valve full CLOSE: Space between ball and shell, Ball bore portion
6. Floating ball valve has a mechanism to seal by pushing ball against the seat of the outlet side with fluid pressure. Please consult with NDV or local representative in 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.

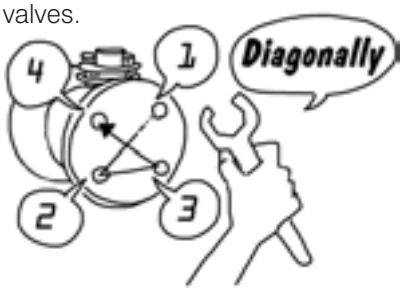
3. Storage

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.)



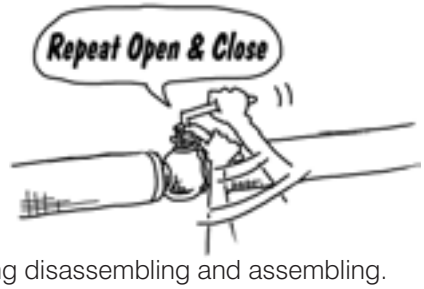
5. Operation

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.

NDV NIPPON DAIYA VALVE CO., LTD.

Head Office: 1-3-22, Hiro-machi, Shinagawa-ku, Tokyo 140-0005
TOKYO Sales Department: Tel. TOKYO (03)3490-4801　Fax. TOKYO (03)3490-7950
INTERNATIONAL Sales Department: Tel. TOKYO (03)5434-5330　Fax. TOKYO (03)5434-5331

NAGOYA Branch: 3-2108, Nakajima-shincho, Nakagawa-ku, Nagoya-shi, Aichi 454-0932
Tel. AICHI (052)354-3171　Fax. AICHI (052)354-3174

OSAKA Branch: Takakura Bldg., 2-5-9, Awaji-machi, Chuo-ku, Osaka-shi, Osaka 541-0047
Tel. OSAKA (06)6203-7721　Fax. OSAKA (06)6222-5895

OKAYAMA Branch: Ima 8-chome, No.2 Bldg., 3-35, Ima 8-chome, Kita-ku, Okayama-shi, Okayama 700-0975
Tel. OKAYAMA (086)241-2669　Fax. OKAYAMA (086)244-3540

KITA-KYUSHU Branch: 2-2-4, Tate-machi, Kokurakita-ku, Kitakyushu-shi, Fukuoka 803-0818
Tel. FUKUOKA (093)571-2438　Fax. FUKUOKA (093)591-3277

http://www.ndv.co.jp

19. 03. H0.5A
15. 03.