

NDV SANITARY VALVES



Product Guide	4
Product List	6

1. Bio-Clean Diaphragm Valves

1-1. Features of Bio-Clean Diaphragm Valves	8
1-2. Standard Specifications	10
1-3. Manually Operated Valves	12
1-4. Pneumatically Operated ON-OFF Valves (Standard): BPO1400NB(N)	13
1-5. Pneumatically Operated ON-OFF Valves (Stainless Steel Actuator): BPO1400N ..	15

2. Products for Dead Spaces Bio-Clean Diaphragm Valve Series

2-1. Self-Drain Valves: Type-F	18
2-2. Sampling Valves: Type-P	19
2-3. 3-Way Valves: Type-K	20
2-4. Tank Bottom Valves: Type-T	21

3. Special Valves · Related Products Bio-Clean Diaphragm Valve Series

3-1. Branch Valves	24
3-2. Combination Valves, Multi-Branch Valves	26
3-3. Electronic Flow Control Valves	27
3-4. Other Related Products	28

4. Sanitary Valves · Clean Room Related Products

4-1. Sanitary Ball Valves	32
4-2. Sanitary Check Valves	35
4-3. Sanitary Butterfly Valves	36
4-4. Powder & Granule / Tablet Discharge Valves	37
4-5. Ultra-High Airtight Dampers	38

5. Technical Materials

① Valve Main Body Dimension List	42
② Inspection Pressure	44
③ Cleaning Specifications	44
④ Valve Stroke and Cv-Value	44
⑤ Pneumatically Operated ON-OFF Actuator Selection Table: Operating Pressure 0.3 MPa	44
⑥ Product Code Descriptions	45
⑦ Air Chamber Volumes and Air Consumption for BPO1400NB(N)	46
⑧ Various Certificates	46

6. Safety Instructions

SANITARY VALVES

Contents

Bio-Clean Diaphragm Valves

Products for Dead Spaces

Special Valves · Related Products

Sanitary Valves · Clean Room Related Products

Technical Materials

Safety Instructions

7

17

23

31

41

47

Products for Dead Spaces

Self-Drain Valve
Type-F



DN8-100

Sampling Valve
Type-P



DN8-100

3-Way Valve
Type-K



DN8-80

Tank Bottom Valve
Type-T



DN15-100

Product List

○: Standard ☆: Option —: Not Applied

Bio-Clean Diaphragm Valve Series

		Simplified Code		Standard 2-Way Valves						Valves for Dead Spaces				Special Valves***
				Main Body Material		Lined Body		Self-Drain		Sampling Valve		3-Way Valve	Tank Bottom Valve	Branch Valve
				Standard Nominal Size Range*		Stainless Steel Body	B459 (2S)/(S)	B459 (M)	B460 (S)	B414 (F)	B413 (F)	B459 (F)	B414 (P)	B414 (K)
Connection Standard	ISSC	Ferrule (Clamp Joint)	○	○	—	○	○	○	—	—	○	○	—	—
	JT	Astro (TIG) Welding	☆	—	—	—	☆	—	—	—	☆	—	—	—
	J10KFF (RF)	Flange	☆	○	—	—	☆	○	—	—	☆	—	—	—
	ISSU	Union Screw	☆	—	—	—	☆	—	—	—	☆	—	—	—
Main Body Surface Finish Classification	B1	#400 Buffing: Inner/Outer Surfaces	☆	—	—	—	☆	—	—	—	☆	—	—	—
	B2	#400 Buffing: Inner Surface	○	—	—	—	—	—	—	—	—	—	—	—
	B3	#400 Buffing: Outer Surface (No-Burnt Color)	☆	—	—	—	—	—	—	—	—	—	—	—
	B4	#400 Buffing: Outer Surface (Burnt Color)	—	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆
	E1	Inner Surface Electropolishing after #400 Buffing on Inner/Outer Surfaces	☆	—	—	—	—	—	—	—	—	—	—	—
	E2	Inner Surface Electropolishing after #400 Buffing on Inner Surface	☆	—	—	—	—	—	—	—	—	—	—	—
Diaphragm	TX/CE	New PTFE/EPDM	—	—	—	—	—	—	—	—	—	—	—	—
	TX/CX	New PTFE/EPDM + α	—	—	—	—	—	—	—	—	—	—	—	—
Operation Type	Manual	Stainless Steel Handle	—	—	—	—	—	—	—	—	—	—	—	—
		Aluminum Handle	—	—	—	—	—	—	—	—	—	—	—	—
		Quick Open/Close Handle	—	—	—	—	—	—	—	—	—	—	—	—
Auto	Pneumatically Operated ON-OFF Valve	Pneumatically Operated ON-OFF Valve	—	—	—	—	—	—	—	—	—	—	—	—
		Two Stage Open/Close Actuator	—	—	—	—	—	—	—	—	—	—	—	—
		Electronic Flow Control Valve	—	—	—	—	—	—	—	—	—	—	—	—
		Pneumatically Operated Control Valve	—	—	—	—	—	—	—	—	—	—	—	—
		Electrically Operated Valve	—	—	—	—	—	—	—	—	—	—	—	—

* Please contact us for a possibility of producing a product other than the standard. ** With a manufacturing record of special clamp type. Please contact us for details. *** Other than this, specific orders for special valves and related products are welcome.

Please contact our sales dept. or local representative for materials and nominal sizes other than those listed in this table.

2

Bio-Clean Diaphragm Valve Series

Products for Dead Spaces

2-1. Self-Drain Valves: Type-F

- ① Features of Products
- ② Valve Specifications

2-2. Sampling Valves: Type-P

- ① Features of Products
- ② Valve Specifications
- ③ Major Dimensions

2-3. 3-Way Valves: Type-K

- ① Features of Products
- ② Valve Specifications
- ③ Major Dimensions

2-4. Tank Bottom Valves: Type-T

- ① Features of Products
- ② Valve Specifications
- ③ Major Dimensions

2-1. Self-Drain Valves: Type-F

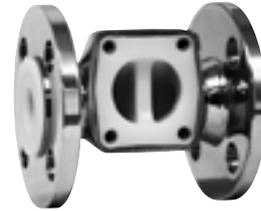
1 Features of Products

What is the Self-Drain Valve?

- A valve main body with enhanced fluid accumulation prevention effect of Bio Clean Diaphragm Valve series.
- This valve has a structure that eliminates the fluid accumulation by horizontally positioning the valve axis when implementing in a horizontal pipeline.

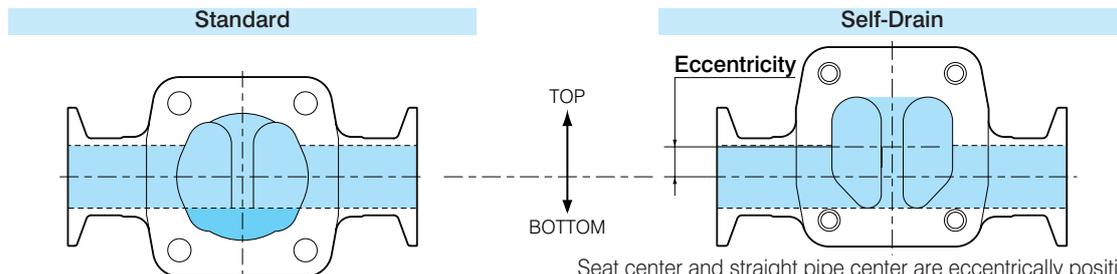


Stainless Steel Main Body: B414 (F)



PFA Lined Main Body: B459 (F)

Comparison with Standard Valve Main Body (with valve axis horizontally positioned)



The valve seat is on the same centerline with straight pipe.

Seat center and straight pipe center are eccentrically positioned and the bottom end of valve seat is in line with inner wall of straight pipe.

Example of Applications

For various biotechnology systems, ultra-pure water production system for semiconductor industries and other systems requiring zero liquid accumulation in fluid path

2 Valve Specifications

Stainless Steel

Manufactured Main Bodies

Name	Main Material	Material Code	Connection Standard and Manufacturing Range			
			Ferrule	Astro (TIG) Welding*	Union Screw*	Flange*
			Nominal Size	Nominal Size	Nominal Size	Nominal Size
Stainless Steel Forged	SUS316L	14(F)	8-50	8-50	8-50	8-50
Stainless Steel Cast	SCS16	13(F)	65-100	65-100	65-100	65-100

* Option

Lined Main Bodies

Manufactured Main Bodies

Name	Base Material	Material Code	Connection Standard and Manufacturing Range	
			Flange	
			Nominal Size	
PFA Lining ★	SCS13	59(F)	15-50	

★: In case of export, export license stipulated in the Foreign Exchange and Foreign Trade Control Law of Japan and/or if necessary, export-related laws and regulations of the United States of America and other countries is required.

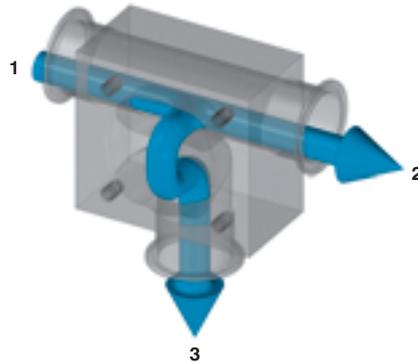
Other Specifications

- Main body surface finish classifications, diaphragm specifications, etc., are in accordance with the standard specifications. (Ref. page 10-11)
- Interchangeability with the units for standard main bodies allows the common use with the actuators for manually operated valves and pneumatically operated ON-OFF valves.

2-2. Sampling Valves: Type-P

1 Features of Products

- Sampling of fluid without a dead space (pockets or fluid accumulation).
- A compact body that allows a direct implementation in pipeline and the structure with no residual liquid in a valve.
- Applicable for a wide range of applications, such as branching, merging (mixing), introduction of washing water or sterilization steam and discharging, as well as sampling.



Valve	Connected Ports	Port No.
Open	1 - 2 1 - 3 2 - 3	
Close	1 - 2	

2 Valve Specifications

Standard Specifications

Manufactured Main Bodies

Main Body Material	SUS316L
Nominal Size (DN)	Combination of main pipe and valve • Standard: 15–50 (other range supplied as option)
Operation Type	Manual operation and pneumatic operation are applicable.

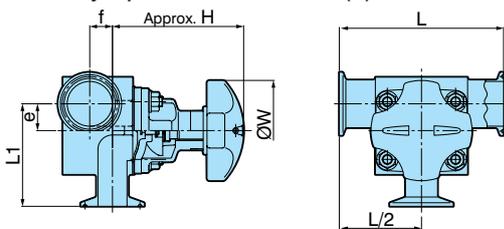
Other Specifications

- Main body surface finish classifications, diaphragm specifications, etc., are in accordance with the standard specifications. (Ref. page 10–11)
- Interchangeability with the units for standard main bodies allows the common use with the actuators for manually operated valves and pneumatically operated ON-OFF valves.
- Please contact us for PFA coated main body (special clamp connection).

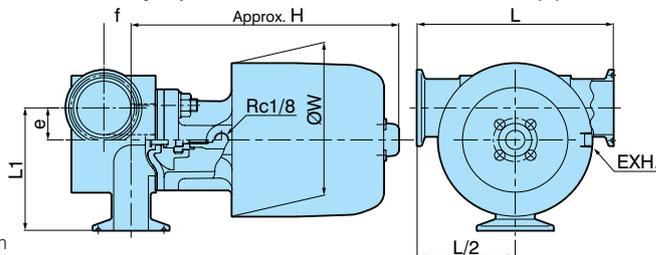
3 Major Dimensions (reference)

A typical example is shown with the combination of various nominal sizes and actuators. Please contact us for combinations other than the table below.

Manually Operated Valve: B414 (P) N



Pneumatically Operated ON-OFF Valve: BPO1414 (P) NB



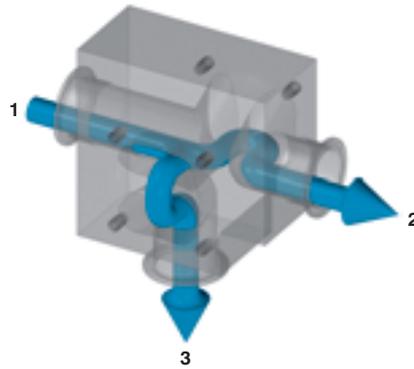
Unit: mm

Main Pipe × Valve DN (S)	L	L1	e	f	Manually (B400N)		Pneumatically ON-OFF (BPO)		
					Approx. H	W	Actuator	Approx. H	W
15 × 15 (1S × 1S)	90	62.3	11.3	—	103	70	07	156	87
25 × 15 (1S × 1S)	100	65.0	14.0	11.0	95	70	07	148	87
25 × 25 (1S × 1S)	130	78.5	15.0	—	114	80	09	188	102
40 × 15 (1.5S × 1S)	110	67.4	20.4	18.5	94	70	07	147	87
40 × 25 (1.5S × 1S)	130	81.8	21.4	18.0	104	80	09	178	102
40 × 40 (1.5S × 1.5S)	160	98.5	21.9	—	145	100	12	210	138
50 × 15 (2S × 1S)	120	77.4	26.4	24.0	95	70	07	148	87
50 × 25 (2S × 1S)	140	90.9	27.4	27.0	104	80	09	178	102
50 × 40 (2S × 1.5)	160	107.4	27.9	21.0	133	100	12	198	138
50 × 50 (2S × 2S)	190	124.4	28.9	—	161	125	16	253	183

2-3. 3-Way Valves: Type-K

1 Features of Products

- Direct installation in a pipeline, compact and a structure with no residual fluid in valve.
- A wide range of application, such as branching, merging (mixing), introduction of washing water and sterilization steam, and discharge.



Valve A	Valve B	Connected Ports	Port No. Diagram
Open	Close	1 - 2	
Open	Open	1 - 2 1 - 3 2 - 3	
Close	Open	1 - 3	
Close	Close	—	

2 Valve Specifications

Standard Specifications

Manufactured Main Bodies

Main Body Material	SUS316L
Nominal Size (DN)	Combination of main pipe and valve • Standard: 15–50 (other range supplied as option)
Operation Type	Manual operation and pneumatic operation are applicable.

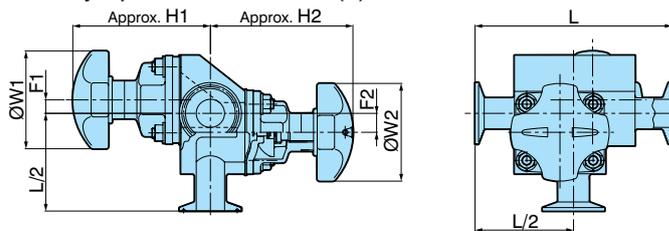
Other Specifications

- Main body surface finish classifications, diaphragm specifications, etc., are in accordance with the standard specifications. (Ref. page 10–11)
- Interchangeability with those units for standard main bodies allows the common use with the actuators for manually operated valves and pneumatically operated ON-OFF valves.
- Please contact us for PFA coated main bodies (special clamp connection).

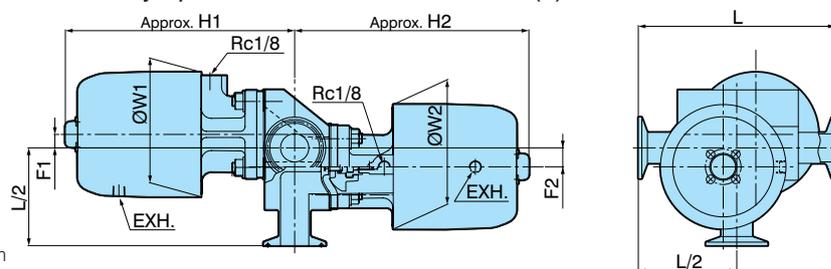
3 Major Dimensions (reference)

A typical example is shown with the combination of various nominal sizes and actuators. Please contact us for combinations other than the table below.

Manually Operated Valve: B414 (K) N



Pneumatically Operated ON-OFF Valve: BPO1414 (K) NB



Unit: mm

Main Pipe × Valve DN (S)	L	F1	F2	Manually Operated Valve (B400N)				Pneumatically Operated ON-OFF Valve (BPO)					
				Approx. H1	Approx. H2	W1	W2	Actuator: A	Approx. H1	W1	Actuator: B	Approx. H2	W2
15 × 15 (1S × 1S)	130	5.7	11.8	103	103	70	70	07	156	87	07	156	87
25 × 15 (1S × 1S)	160	11.0	14.5	112	109	80	70	09	186	102	07	162	87
25 × 25 (1S × 1S)	160	11.0	15.5	112	116	80	80	09	186	102	09	190	102
40 × 15 (1.5S × 1S)	200	14.7	20.9	142	114	100	70	12	207	138	07	167	87
40 × 25 (1.5S × 1S)	200	14.7	21.9	142	125	100	80	12	207	138	09	199	102
40 × 40 (1.5S × 1.5S)	200	14.7	21.9	145	147	100	100	12	209	138	12	211	138
50 × 15 (2S × 1S)	230	14.0	26.9	154	117	125	70	16	246	183	07	170	87
50 × 25 (2S × 1S)	230	14.0	27.9	154	130	125	80	16	246	183	09	204	102
50 × 40 (2S × 1.5)	230	14.0	27.9	154	155	125	100	16	246	183	12	220	138
50 × 50 (2S × 2S)	230	14.0	28.4	154	164	125	125	16	246	183	16	256	183

2-4. Tank Bottom Valves: Type-T

1 Features of Products

- Excellent agitation efficiency with direct welding on tank bottom
- No gland packing, stem, seat, gasket, etc., at contacting zone with liquid, and the open/close operation only by diaphragm will facilitate smooth discharge of tank contents with almost no residues. Extremely low contamination attributable to valve parts, and the washing and sterilization are easy and secure.
- A wide range of nominal size from DN15 to 100 (4S) facilitates the application from small container of 10 L to a medium size tank of 10,000 L.



2 Valve Specifications

Standard Specifications

Manufactured Main Bodies

Main Body Material	SUS316L
Nominal Size (DN)	15–100
Operation Type	Manual operation and pneumatic operation are applicable.
Option	Flange connection, Branch pipe, etc.

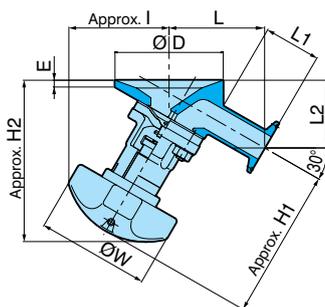
Other Specifications

- Main body surface finish classifications, diaphragm specifications, etc., are in accordance with the standard specifications. (Ref. page 10–11)
- Interchangeability with the units for standard main bodies allows the common use with the actuators for manually operated valves and pneumatically operated ON-OFF valves.

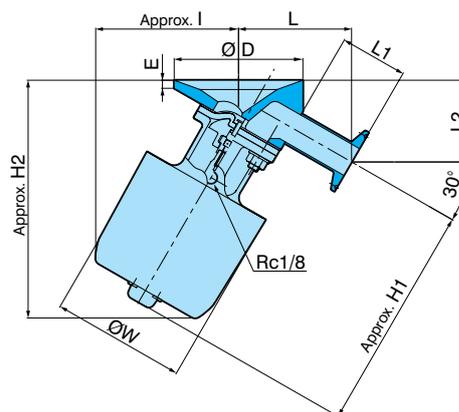
3 Major Dimensions (reference)

A typical example is shown with the combination of various actuators. Please contact us for combinations other than the table below.

Manually Operated Valve: B414 (T) N



Pneumatically Operated ON-OFF Valve: BPO1414 (T) NB



Unit: mm

Nominal Size DN (S)	L	L1	L2	D	E	Manually Operated Valve (B400N)					Pneumatically Operated ON-OFF Valve (BPO)					
						Approx. H1	Approx. H2	Approx. I	W	Mass (Approx. kg)	Actuator	Approx. H1	Approx. H2	Approx. I	W	Mass (Approx. kg)
15	73	50	59	69	14	96	112	63	70	1.5	07	148	156	84	87	1.5
20	76	50	60	80	12	100	113	67	70	2.0	09	166	173	103	102	2.3
25 (1S)	84	50	60	95	6	106	119	70	80	2.5	09	180	184	105	102	2.8
40 (1.5S)	103	50	68	139	6	137	149	86	70	4.5	12	203	214	126	138	5.6
50 (2S)	129	63	83	177	6	154	169	99	80	7.0	16	247	261	154	183	10.0
65 (2.5S)	140	63	90	204	12	182	212	107	100	11.0	16B*	299	300	166	194	16.0
											20B*	350	347	199	236	22.0
80 (3S)	152	63	105	254	12	200	243	131	70	17.0	20B*	369	370	209	236	27.2
											25B*	407	404	248	286	40.6
											20B*	387	407	242	236	36.4
100 (4S)	179	63	153	301	12	263	325	193	80	22.0	25B*	425	438	274	286	49.8

* BPO1400N

3

Bio-Clean Diaphragm Valve Series

Special Valves · Related Products

3-1. Branch Valves

- ① Features of Products
- ② Valve Specifications
- ③ Major Dimensions
- ④ Combination Pattern Diagrams

3-2. Combination Valves, Multi-Branch Valves

- ① Combination Valves
- ② Multi-Branch Valves

3-3. Electronic Flow Control Valves

- ① Features and Specifications of Products
- ② Actuator Selection Table
- ③ Major Dimensions

3-4. Other Related Products

- ① Clamp Connection Corrosion-Proof Valves Fluororesin (ETFE) Lined Main Body
- ② Self-Drain Descending Valves
- ③ Two Stage Open/Close Actuator
- ④ Steam Trap Substituting Valves

3-1. Branch Valves

1 Features of Products

- The combination valves with vertically/horizontally-branched valves (or pipes) on the position with no liquid accumulation of main valve
- Available for a wide range of applications, such as branching, merging, sampling, and introduction of sterilization steam.
- The simple structure branch valve (or pipe) combination has a higher cost benefit compared to conventional sampling valves or 3-way valves. (Pay attention on dead space generated between main valve and branch valve from structural reason)

Horizontal main valve / vertical branch valve



2 Valve Specifications

Standard Specifications

Main Body Material	SUS316L
Nominal Size (DN)	Combination of main pipe and valve • Standard: 25–50 (other range supplied as an option)
Operation Type	Manual operation and pneumatic operation are applicable.

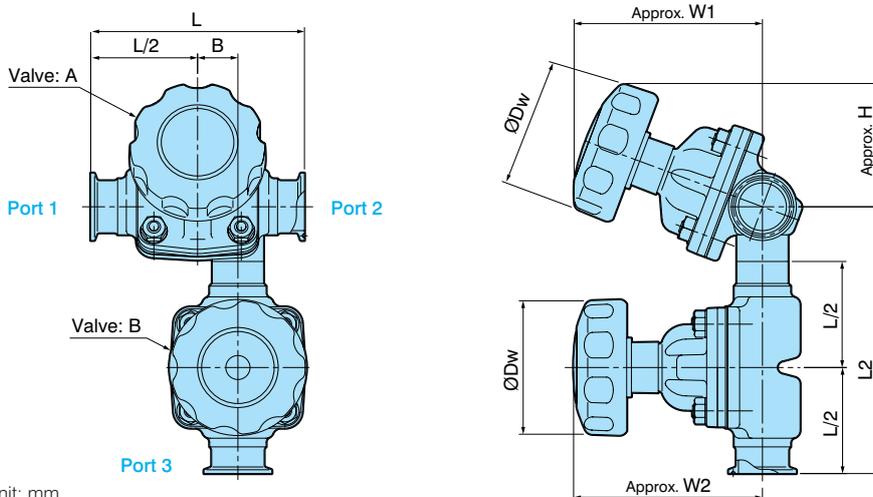
Other Specifications

- Main body surface finish classifications, diaphragm specifications, etc., are in accordance with the standard specifications. (Ref. page 10–11)
- Interchangeability with the units for standard main bodies allows the common use with the various actuators for manually operated valves and pneumatically operated ON-OFF valves.

3 Major Dimensions (reference)

A reference example is shown below for horizontal main valve with vertical branch valve. The combination of various mounting pattern, nominal size, operation type, etc., is manufactured as requested. (Please refer to the next page for details of mounting patterns.)

Manually Operated Valve: BC414 (A)



Unit: mm

Nominal Size DN (S)	L	L2	Dw	B	W1	W2	H
15	102	145	63	16.0	92	89	51
20	118	165		18.5	100	98	
25 (1S)	127		80	19.0	113	112	75
40 (1.5S)	159	200	100	30.0	141	141	92
50 (2S)	191	250	125	35.5	168	169	103

Valve A	Valve B	Connected Ports	Port No.
Open	Close	1 - 2	1 2 3
Open	Open	1 - 2 2 - 3 1 - 3	1 2 3
Close	Open	2 - 3	1 2 3
Close	Close	—	1 2 3

4 Combination Pattern Diagrams

1 Branch Valves (Horizontal Main Valve)

Branch Valve Position	Right Side		Left Side	
Branch Valve Direction	Front	Back	Front	Back
Main Valve: Horizontal Branch Valve: Vertical	 A	 B	 C	 D
Main Valve: Horizontal Branch Valve: Horizontal	 E	 F	 G	 H

2 Branch Valves (Vertical Main Valve)

Branch Valve Position	Upper Side		Lower Side	
Branch Valve Direction	Front	Back	Front	Back
Main Valve: Vertical Branch Valve: Horizontal	 I	 J	 K	 L

3 Branch Valves (Horizontal Main Valve)

Branch Valve Position	Right Side		Left Side	
Branch Valve Direction	Front	Back	Front	Back
Main Valve: Horizontal Branch Pipe: Vertical	 R	—	 S	—
Main Valve: Horizontal Branch Pipe: Horizontal	 T	—	 U	—

4 Branch Valve (Vertical Main Valve)

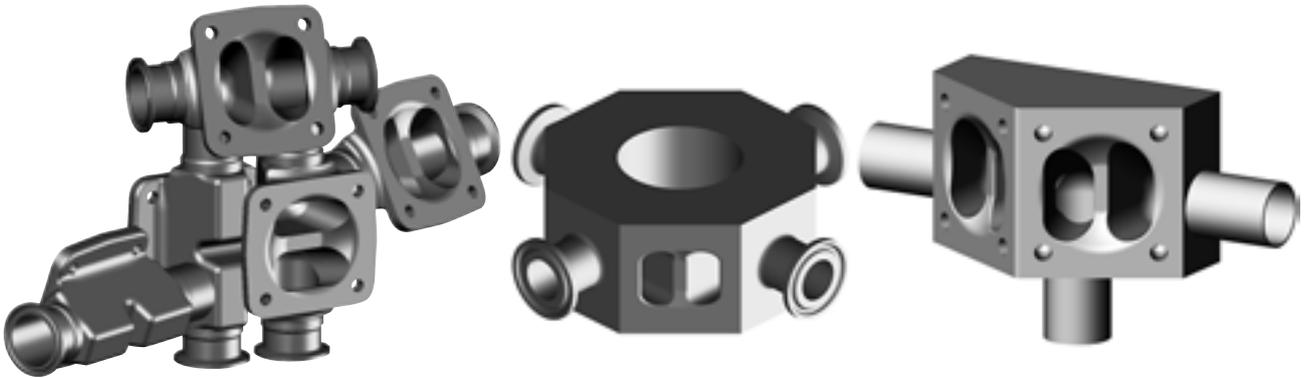
Branch Valve Position	Upper Side		Lower Side	
Branch Valve Direction	Front	Back	Front	Back
Main Valve: Vertical Branch Valve: Horizontal	 V	—	—	—

3-2. Combination Valves, Multi-Branch Valves

1 Combination Valves

The following requests are responded through the manufacturing of combination valves. Please contact our sales dept. or local representative for a detailed study.

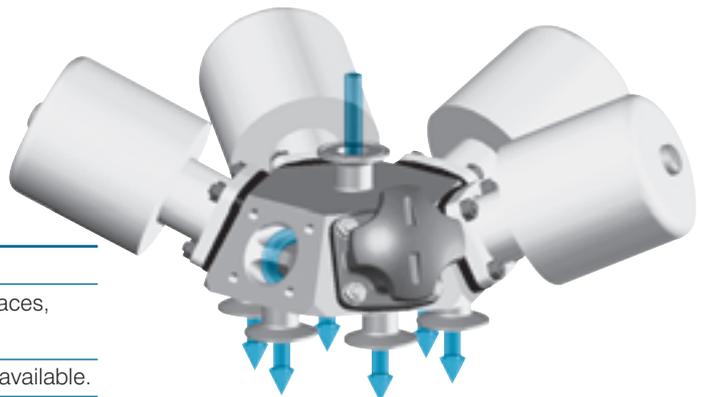
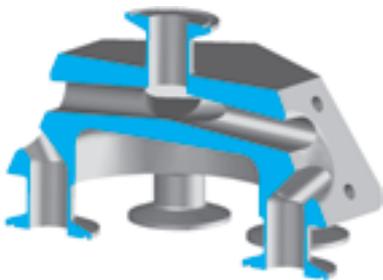
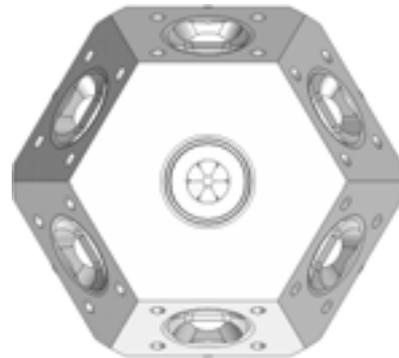
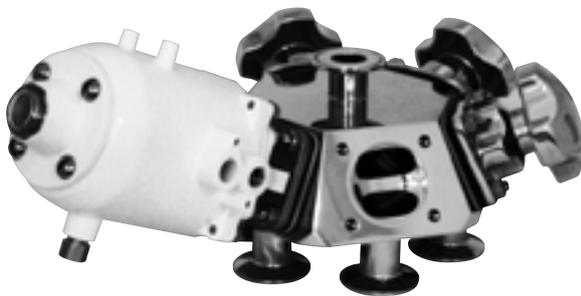
- Separation or merging of flow is required, but shall be as compact as possible
- Integration of multiple valves is required for compactification.
- A countermeasure for dead spaces in various processes is required.
- Reduction of retained water is required with an installation in a special posture.



2 Multi-Branch Valves

- A combination of a number of valves is integrated into a compact main body with branched and merged functions.
- The number of ports are designed and manufactured to the request.
- The interchangeability of actuator with standard main bodies allows the use for both manually and pneumatically operated valves.

Example of 6 Port Valve: Branching in 6 directions or merging from 6 directions



Specifications

Main Body Material	SUS316L
Main Body Surface Finish	#400 Buffing: Inner/Outer Surfaces, Electropolishing: Inner Surface
Connection Standard	Ferrule, other connections are available.

3-3. Electronic Flow Control Valves

1 Features and Specifications of Products

Features

- A small in diameter, dedicated electronic flow control actuator can be mounted.
- Optimum for flow control in a clean room or sterilization room where the discharge of instrument air has to be avoided.

Examples of Applications

Environmental automatic control valve for culture vessel, automatically controlled measurement valve for products of different viscosity and other cases where precise flow regulation is required.

Actuator Specifications

Nominal Size (DN)	8–50
Product Type	DN8, 10: BMMA4400/DN15–50: BMMB4400
Power Supply	DC24V (AC100–120V, AC200–240V is available as well)
Signal	4–20 mA or DC1–5V
Structure	Outdoor Drip Proof
Action	Reverse Acting, Direct Acting (switchover)
Connector	G1/2 (PF1/2) female, with cable connector (with cable 1 m)
Max. Working Pressure	0.7 MPa
Option	With Terminal Box: G1/2 (PF1/2) female × 2, screw terminal (≦ 2 mm)



Other Specifications

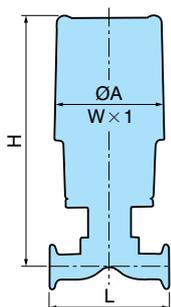
- The specifications for main bodies and diaphragms are in accordance with standard specifications (Ref. page 10 - 11).
- A rolling diaphragm type control valves are recommended when a pneumatically operated control valve is requested. The actuator specifications, etc., are similar to our general-purpose function products BO (BC) 3400. Please refer to the catalog "Diaphragm Valve" together for details. (Interchangeable with various main bodies and diaphragms for bio-clean diaphragm valves)

2 Actuator Selection Table

Standard Specifications

Nominal Size DN (S)	Working Pressure (MPa)						
	0.1	0.2	0.3	0.4	0.5	0.6	0.7
8/10			MSP4-17				
15							
20			MSP6-34				
25 (1S)							
40 (1.5S)			MSP6-36				
50 (2S)		MSP6-46					

3 Major Dimensions



Unit: mm

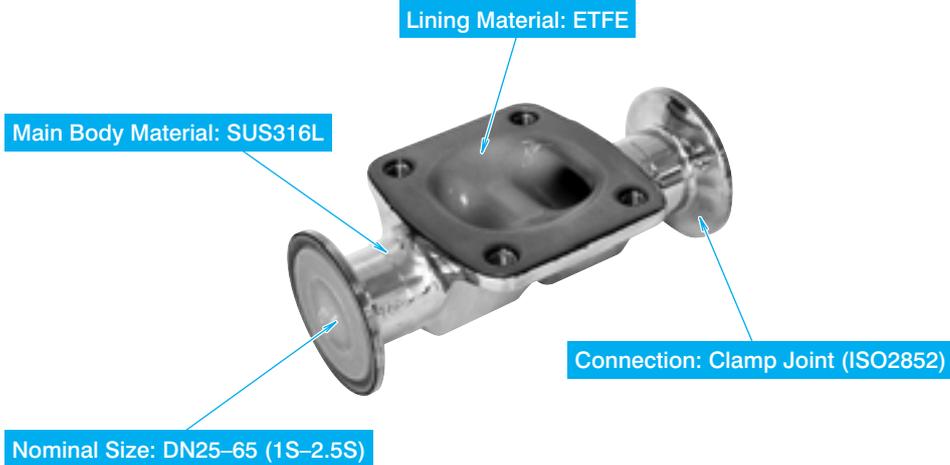
Nominal Size DN (S)	Actuator	ØW W × 1	L	Approx. H	Mass (Approx. kg)
8/10	MSP4-17	146 × 110	90	204	2.0
15	MSP6-34		102	331	2.2
20	MSP6-36		118	340	2.5
	MSP6-34		127	343	2.6
40 (1.5S)	MSP6-34		159	357	3.5
	MSP6-36		191	385	4.5
50 (2S)	MSP6-46				

The above table is based on Ferrule main body made of SUS316L. Contact us for detailed dimensions, etc., for each valve.

3-4. Other Related Products

1 Clamp Connection Corrosion-Proof Valves: Fluororesin (ETFE) Lined Main Body

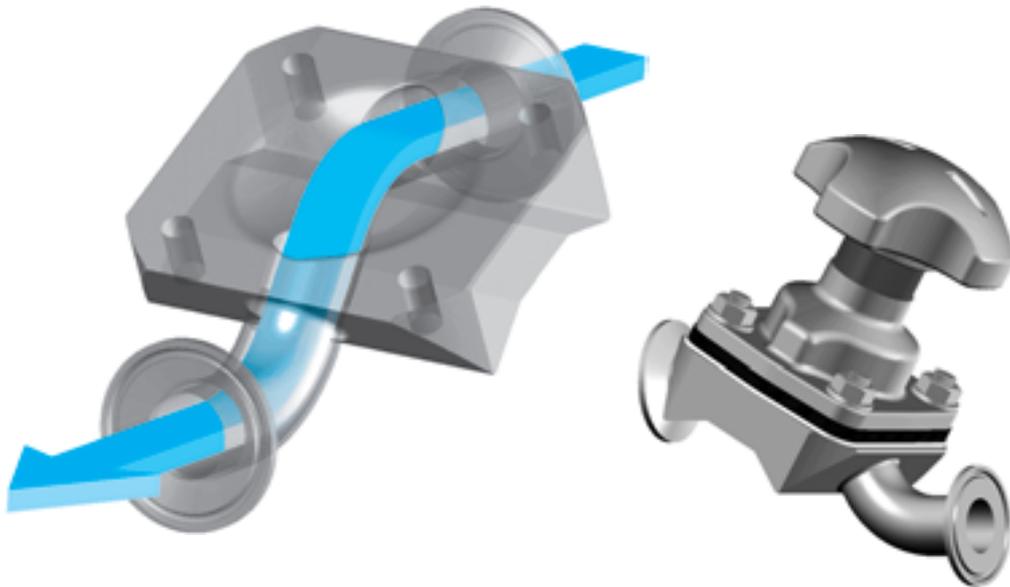
The optimum main bodies as the countermeasures for corrosive fluids, crevice corrosion by Cl⁻ ion and elution of metal ions for sanitary piping.



Features of Product

- Fluororesin (ETFE) lining is corrosion proof to strong acids, inorganic alkali, halogens, and metal salt solutions.
- Compared to special alloy materials, such as expensive duplex stainless steel, generally better in cost performance.
- Adoption of rotational molding process for acquiring strong adhesion of lining on the metal body eliminates the lifting or swelling of lining for the high temperature vacuum specifications.
- The joints and gaskets in market can be used.
- Max. Working Temperature: 120°C

2 Self-Drain Descending Valves



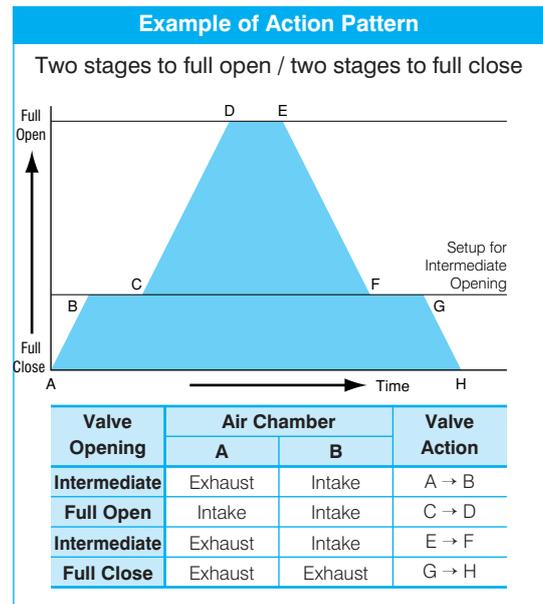
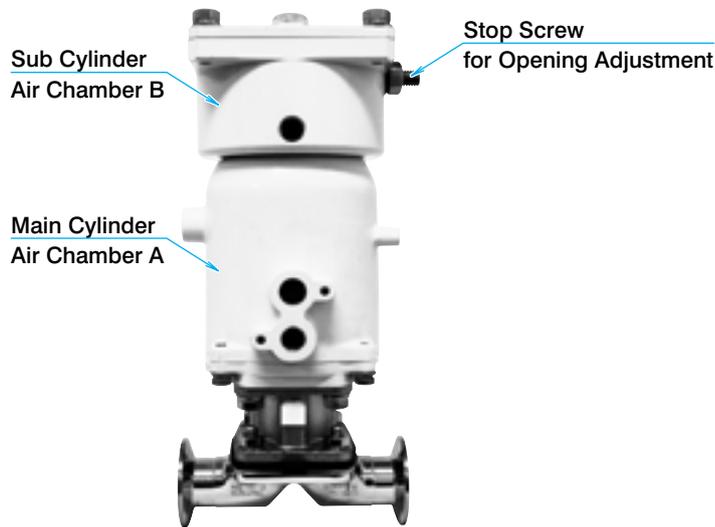
- Differently from conventional self-drain structure of horizontal installation of actuator in the pipeline, the vertical installation structure of actuator makes it possible to drain the fluid stagnation while minimizing the space.
- The valve seat configuration is identical with our standard specification diaphragm valves. The conventional standard diaphragms can be used.
- Over 80% of path area is secured compared to the contracted port diameter. This brings about a larger Cv-value compared to our conventional products.*

* The Cv-values are our internally measured values. The values in real operation may be lower than the Cv-values above depending on various practical conditions of use.

3 Two Stage Open/Close Actuator

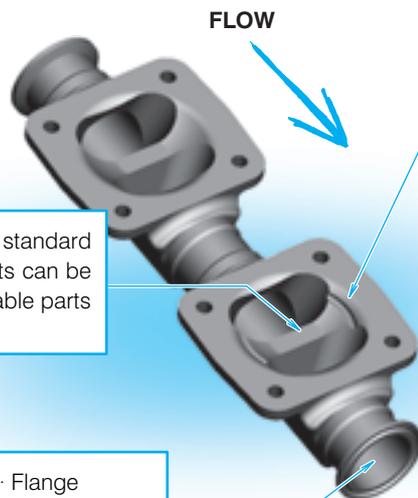
Features of Products

- Non-step valve position adjustment is available.
- Implemented as filling valves for medical drug products and potable water.
- Interchangeable with various main bodies of bio-clean diaphragm valves.
- The adjusting range for medium opening: 0–30%



• Patterns “one stage to full open / two stages to full close” and “two stages to full open / one stage to full close” are available as well.

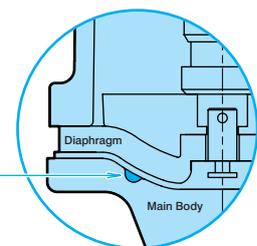
4 Steam Trap Substituting Valves



The design is in accordance with NDV standard excluding grooves. NDV standard parts can be used for actuators as well as consumable parts such as diaphragms.

Connection Type: Clamping · Welding · Flange
Nominal Size: DN8–100 (4S)
Electropolishing is available on flow path surfaces.

The drain will be continuously discharged through a groove formed on the valve seat



Features of Products

- Simple design drain discharge valve for sanitary piping.
- Application of bio-clean diaphragm valve; an optimum solution for various manufacturing equipment, such as medical drugs, cosmetics, foods and semiconductors.
- Diaphragm valve continuously draining through a small hole on the valve seat predesigned to the predicted drain quantity; an idea that did not exist in conventional steam trap. The combination of this product and our standard diaphragm valve will configure a clean and stable draining system.
- The simple configuration eliminating bypass piping can reduce the chance of pollution.
- The basic structure of the diaphragm valve can avoid immediate failure even when foreign substances enter the valve seat and can provide excellent maintainability.

Response to the customer's needs through a made to order system is the strength of our company. Please feel free to contact us for any requests regarding options for various operation devices and special shape of main bodies or special materials.

4

Sanitary Valves · Clean Room Related Products

4-1. Sanitary Ball Valves

- ① Product Specifications
- ② Major Dimensions

4-2. Sanitary Check Valves

- ① Product Specifications
- ② Major Dimensions

4-3. Sanitary Butterfly Valves

- ① Product Specifications
- ② Major Dimensions

4-4. Powder & Granule / Tablet Discharge Valves

- ① [Powder & Granular Product Discharging] Sanitary Butterfly Valves
- ② [Tablet Discharging] Sanitary Dampers

4-5. Ultra-High Airtight Dampers

- ① Features of Products
- ② Product Specifications
- ③ Actuator Selection Table
- ④ Major Dimensions

4-1. Sanitary Ball Valves

1 Product Specifications

2BM: 2-Way Ball Valve / BN3-M: 3-Way Ball Valve

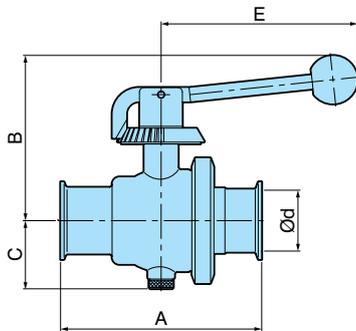
Fluid Contacting Parts Material	SUS316L
Seat Material	PTFE
Packing Material	Standard: Fluorine Rubber Option: EPDM, Silicon Rubber, NBR
Surface Finish	Inside: #320-#400 Buffing Outside: #320-#400 Buffing
Working Temperature Range	-5-95°C (NBR: -5-80°C)
Connection Standard	Ferrule Screw in accordance with ISO standard
Max. Working Pressure	0.7 MPa
Pneumatic Operating Pressure	0.4 MPa (max 0.7 MPa)

2BV-M: Small Diameter 2-Way Ball Valve

Fluid Contacting Parts Material	SUS316L
Seat Material	PTFE
Surface Finish	Inside: #400 Buffing Outside: Hairline Finish
Working Temperature Range	0-95°C
Connection Standard	Ferrule Screw in accordance with ISO standard
Max. Working Pressure	0.7 MPa

2 Major Dimensions

2BM: Manually Operated 2-Way Ball Valve

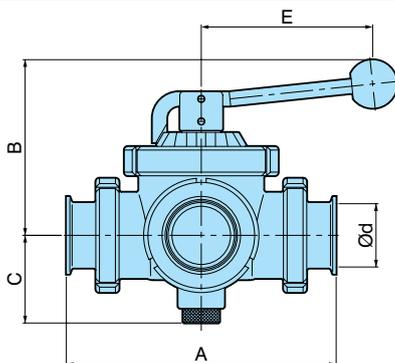


Unit: mm

Nominal Size (DN)	25 (1S)	40 (1.5S)	50 (2S)	65 (2.5S)	80 (3S)	90 (3.5S)	100 (4S)
d	23	35.7	47.8	59.5	72.3	85.1	97.6
A	110	140	164	210	220	250	310
B	100	107	135	145	175	184	195
C	39	48	56	71	83	93.5	104
E	150	150	160	160	207	207	207

Remarks: Resin (ABS) handle for 1S-1.5S, SUS handle for 2S and above

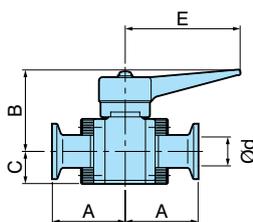
BN3-M: Manually Operated 3-Way Ball Valve



Unit: mm

Nominal Size (DN)	25 (1S)	40 (1.5S)	50 (2S)	65 (2.5S)	80 (3S)	90 (3.5S)	100 (4S)
d	23	35.7	47.8	59.5	72.3	85.1	97.6
A	170	190	220	240	260	300	310
B	130	134	144	173	189	207	215
C	53	59	72	93	99	111	116
E	160	160	160	207	207	277	277

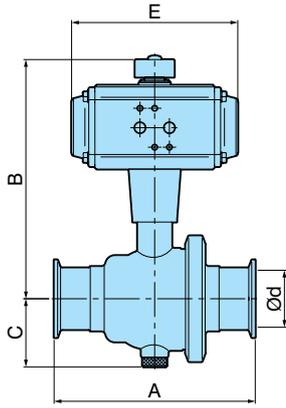
2BV-M: Small Diameter Manually Operated 2-Way Ball Valve



Unit: mm

Nominal Size (DN)	8	10	15
d	10.5	14	17.5
A	45	45	45
B	51	51	54
C	20	20	23
E	70	70	70

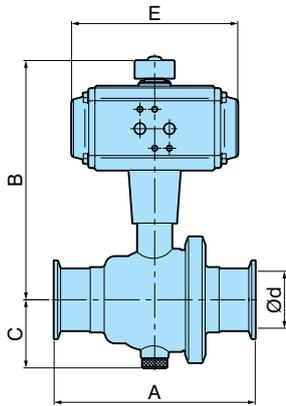
2BM-PW: Pneumatically Operated 2-Way Ball Valve (Double Acting)



Unit: mm

Nominal Size (DN)	25 (1S)	40 (1.5S)	50 (2S)	65 (2.5S)	80 (3S)	90 (3.5S)	100 (4S)
d	23	35.7	47.8	59.5	72.3	85.1	97.6
A	110	140	164	210	220	250	310
B	183	190	199	229	253	262	290
C	39	48	56	71	83	93	103
E	136	136	136	154	154	154	204

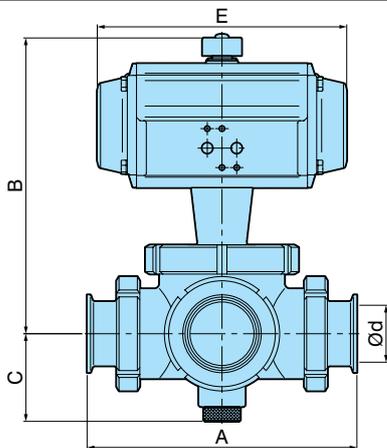
2BM-PS: Pneumatically Operated 2-Way Ball Valve (Single Acting)



Unit: mm

Nominal Size (DN)	25 (1S)	40 (1.5S)	50 (2S)	65 (2.5S)	80 (3S)	90 (3.5S)	100 (4S)
d	23	35.7	47.8	59.5	72.3	85.1	97.6
A	110	140	164	210	220	250	310
B	183	190	219	229	270	279	290
C	39	48	56	71	83	93	103
E	136	136	154	154	204	204	204

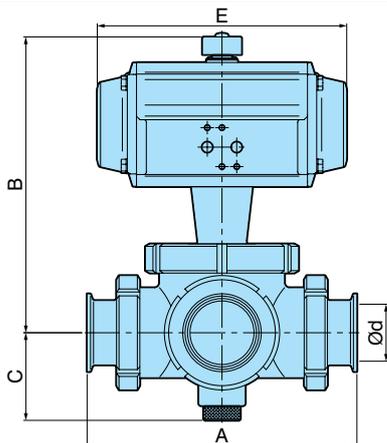
BN3-PW: Pneumatically Operated 3-Way Ball Valve (Double Acting)



Unit: mm

Nominal Size (DN)	25 (1S)	40 (1.5S)	50 (2S)	65 (2.5S)	80 (3S)	90 (3.5S)	100 (4S)
d	23	35.7	47.8	59.5	72.3	85.1	97.6
A	170	190	220	240	260	300	310
B	215	219	246	268	284	319	327
C	53	59	72	93	99	111	116
E	154	154	204	204	204	269	269

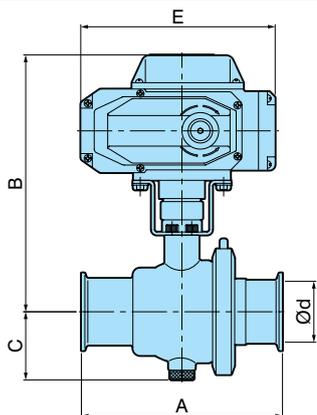
BN3-PS: Pneumatically Operated 3-Way Ball Valve (Single Acting)



Unit: mm

Nominal Size (DN)	25 (1S)	40 (1.5S)	50 (2S)	65 (2.5S)	80 (3S)	90 (3.5S)	100 (4S)
d	23	35.7	47.8	59.5	72.3	85.1	97.6
A	170	190	220	240	260	300	310
B	232	236	276	293	309	359	406
C	53	59	72	93	99	111	116
E	204	204	269	269	269	345	438

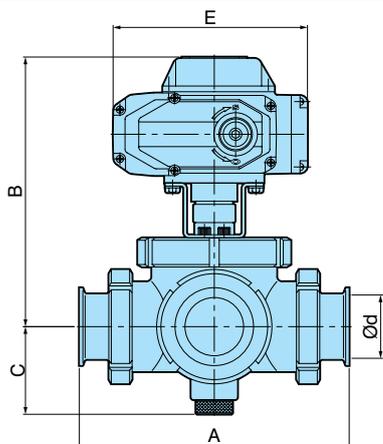
2BM-E: Electrically Operated 2-Way Ball Valve



Unit: mm

Nominal Size (DN)	25 (1S)	40 (1.5S)	50 (2S)	65 (2.5S)	80 (3S)	90 (3.5S)	100 (4S)
d	23	35.7	47.8	59.5	72.3	85.1	97.6
A	110	140	164	210	220	250	310
B	195	202	211	221	276	285	295
C	39	48	56	71	83	93.5	104
E	159	159	159	159	159	159	208

BN3-E: Electrically Operated 3-Way Ball Valve



Unit: mm

Nominal Size (DN)	25 (1S)	40 (1.5S)	50 (2S)	65 (2.5S)	80 (3S)
d	23	35.7	47.8	59.5	72.3
A	170	190	220	240	260
B	207	211	221	274	290
C	53	59	72	93	99
E	159	159	159	208	208

4-2. Sanitary Check Valves

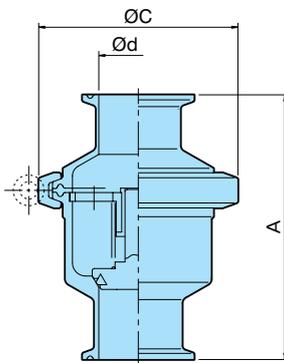
1 Product Specifications

Lift-catch type check valves (non-return valve). Eccentric types and drain nozzle types are prepared as well. Clamp-type mounting of main body provides ease of disassembling/assembling and is excellent in maintenance.

Cracking Pressure	0.01 MPa
Max. Working Pressure	0.5 MPa
Surface Finish	Inside: #320-#400 Buffing Outside: Shot Finish
Ordinary Temperature Range	- 5-100°C (Standard seal material: Fluorine Rubber)
Connection Standard	Ferrule Screw in accordance with ISO standard
Max. Working Pressure	0.5 MPa

2 Major Dimensions

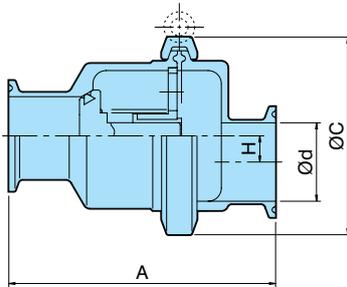
DV: Check Valve



Unit: mm

Nominal Size (DN)	8	10	15	25 (1S)	40 (1.5S)	50 (2S)	65 (2.5S)	80 (3S)	90 (3.5S)	100 (4S)
d	10.5	14	17.5	23.0	35.7	47.8	59.5	72.3	85.1	97.6
A	100	100	100	110	120	130	140	145	170	200
C	63	63	63	77	90	119	132	143	174	202
Mass (kg)			0.55	0.85	1.2	2.0	2.7	3.3	4.8	6.5

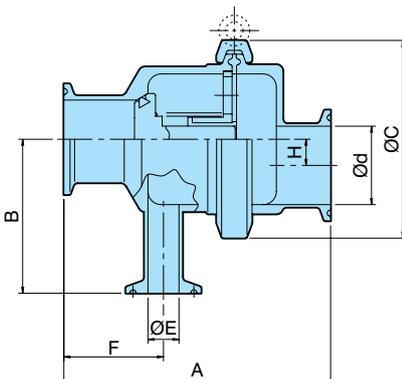
HV: Eccentric Check Valve



Unit: mm

Nominal Size (DN)	8	10	15	25 (1S)	40 (1.5S)	50 (2S)	65 (2.5S)	80 (3S)
d	10.5	14	17.5	23.0	35.7	47.8	59.5	72.3
A	100	100	100	110	120	130	140	145
C	63	63	63	77	90	119	132	143
H	12.6	10.85	9.1	12.4	11.9	18.65	19.05	18.0
Mass (kg)			0.55	0.85	1.2	2.0	2.7	3.3

HNV: Eccentric Check Valve (with Drain Nozzle)



Unit: mm

Nominal Size (DN)	25 (1S)	40 (1.5S)	50 (2S)	65 (2.5S)	80 (3S)
d	23.0	35.7	47.8	59.5	72.3
A	110	120	130	140	145
B	55	70	82	90	95
C	77	90	119	132	143
E	14	14	23	23	23
F	44	45.0	51.5	52.5	54.5
H	12.4	11.9	18.65	19.05	18.0
Mass (kg)	0.95	1.3	2.1	2.8	3.4

4-3. Sanitary Butterfly Valves

1 Product Specifications

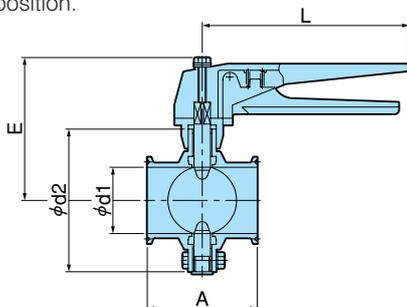
RB series butterfly valves are compactly designed to lightweight pursuing cleanliness in accordance with ISO standard. The features of manual valves are the lightness of operation with extremely low operation torque and low flow resistance when fully opened. There are EPDM materials in accordance with FDA standard and silicon rubbers conforming to Food Sanitation Act for seat ring materials, and can be selected in accordance with the conditions for use.

Fluid Contacting Parts Material	SUS316L
Seat Ring Material	Standard: EPDM, Thermal durability -5~95°C (125°C, 30 min, once a day, with no-operation) Option: Silicon Rubber (Please contact us for specifications)
Surface Finish	Inside: #320-#400 Buffing Outside: Shot Finish
Connection Standard	Ferrule Screw in accordance with ISO standard
Max. Working Pressure	0.7 MPa

2 Major Dimensions

RB-MS: Manually Operated Butterfly Valves

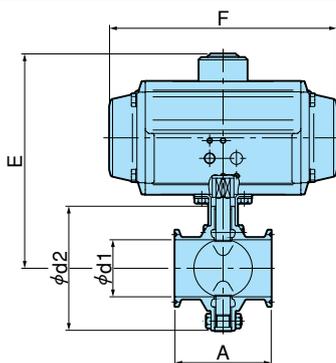
There are 7 stoppers with lock (0°, 15°, 30°, 45°, 60°, 75°, 90°) in the direction from full open to full close for position setting of valve for adjusting the valve position. If fine adjustments are required, an adjustable stopper (option) can be attached for non-step adjustment of position.



Unit: mm

Nominal Size (DN)	25 (1S)	40 (1.5S)	50 (2S)	65 (2.5S)	80 (3S)	100 (4S)
d1	23	35.7	47.8	59.5	72.3	97.6
d2	77	91	104	126	126	150
A	80	80	80	100	100	125
E	92	99	106	120	120	133
L	150	150	150	150	150	150

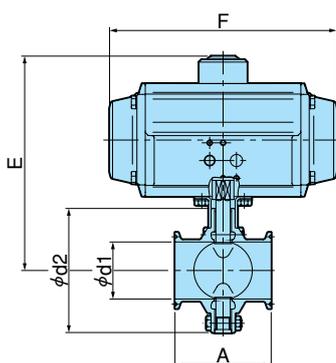
RB-PW: Pneumatically Operated Butterfly Valves (Double Acting)



Unit: mm

Nominal Size (DN)	25 (1S)	40 (1.5S)	50 (2S)	65 (2.5S)	80 (3S)	100 (4S)
d1	23	35.7	47.8	59.5	72.3	97.6
d2	77	91	104	126	126	150
A	80	80	80	100	100	125
E	142	149	170	184	198	210
F	136	136	154	154	204	204

RB-PS: Pneumatically Operated Butterfly Valves (Single Acting)



Unit: mm

Nominal Size (DN)	25 (1S)	40 (1.5S)	50 (2S)	65 (2.5S)	80 (3S)	100 (4S)
d1	23	35.7	47.8	59.5	72.3	97.6
d2	77	91	104	126	126	150
A	80	80	80	100	100	125
E	142	179	184	198	211	223
F	136	204	204	204	241	241

4-4. Powder & Granule / Tablet Discharge Valves

1 [Powder & Granular Product Discharging] Sanitary Butterfly Valves

Features

- The main parts are made of stainless steel and buff grind finished on inner/outer surfaces, that provides no adhesion of powder & granular product and excellent in washability.
- Light-weight design provides the ease of attaching and detaching on the containers and piping.
- Adoption of clamp type allows the quick assembly/disassembly and easy washing.

Standard Specifications

Type	DC507C-SI
Nominal Size (DN)	100(4.5S)–300(12S)
Valve Seat Air-Tightness	3 kPa
Shell Test	0.05 MPa
Working Temperature	Ordinary Temperature (Washable with hot water up to 80°C)
Connection Standard	Ferrule Type (DN100–200: Based on ISO/IDF) (DN250, 300: for discussion)

- Automatic Valve: Contact us for manufacturing of pneumatically operated ON-OFF valves.
- Applicable only for powder & granular discharging.



2 [Tablet Discharging] Sanitary Dampers

Features

- The main parts are made of stainless steel and buff grind finished on inner/outer surfaces, that provides no adhesion of tablets and are excellent in washability.
- Safe discharging of tablets ensured by optimum shape and structure preventing the tablets from remaining.
- The tablets are fed while the damper is closed and the damper is opened for discharging. The structure is designed in such a way that the tablets are not crushed.
- A stopper at the closing position securely maintains the precise position.

Standard Specifications

Type	DC507D
Nominal Size (DN)	150 (6.5S)
Connection Standard	Ferrule Type (Based on ISO/IDF)



Please refer to a catalog "SANITARY TYPE PRODUCTS FOR MEDICAL PLANT" as well for details of products.

4-5. Ultra-High Airtight Dampers

1 Features of Products

Features

- Air tightness of “Zero Leakage”
- Non-Sliding structure of disk and seat prevents wear due to operation and maintains the long-term air tightness.
- All the parts contacting conditioning air are made of stainless steel (SUS304). In addition, metal touch closing action of valve seat reduces deterioration and that will maintain the air tightness for a long period.

Main Applications

- Bio, general aseptic room, other cleaning workrooms and ducts for air conditioning that may be sterilized.
- When the contamination due to entrance of outdoor air has to be prevented.
- Work rooms or laboratories the air exhausting from the room has to be avoided.
- Experimental clean animal breeding room and the test research laboratory that use it.



2 Product Specifications

Standard Specifications

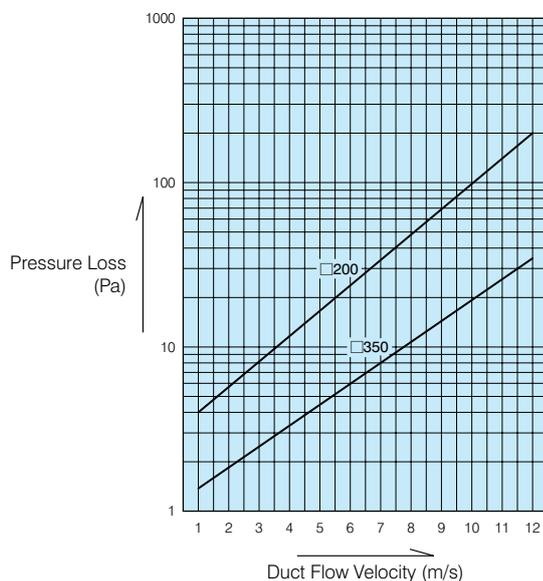
Main Body · Disk Materials	SUS304 (Metal Touch)
Size [mm (inch)]	200 (8B)–650 (26B)
Working Temperature Range	5–70°C
Operation Type	Standard: Electrical Operation Option: Lever Handle, Worm Gear, Pneumatic Operation

Electrically Operated Device Specifications

Device Type	Damper Size	Open/Close Time 50/60 Hz	Power Supply	Output	Space Heater	Thermal Class	Ambient Temp.
SRH-007	200–450 rectangular	18/15 sec.	AC100V	10W	8W	Class-E	-10–50°C
		36/30 sec.					
SRH-020	500–650 rectangular	18/15 sec.	AC200V	40W	8W	Class-E	-10–50°C
		36/30 sec.					

- Open/close status indication is available using the auxiliary contacts.
- The extended open/close time is available by adding a timer, etc., on the operation panel.

Pressure Loss with regard to Flow Velocity by Port Diameter



(Pressure Loss when HEPA filter final resistance of 0.4 kPa is applied)

Installation Posture

Posture of damper installation can be either upright, sideways, or upside down, but the electrically operated types are not installed upside down due to structural reason.

Others

The following items will be confirmed when the customer is inquiring or ordering this damper, regardless of a new installation or an implementation to existing equipment:

- 1 Duct Size
- 2 Flow velocity, static pressure, flow rate in duct
- 3 Operation Type
- 4 Static pressure when reverse flow exists in air-flow
- 5 Power source specifications used (for electrical operation)

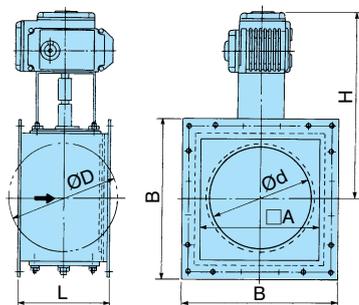
3 Actuator Selection Table

Damper Size	Spring Type	Actuator Electrical SRH	Static Pressure (kPa)								
			-0.5	0	0.5	1.0	1.5	2.0			
<input type="checkbox"/> 200		007									
<input type="checkbox"/> 250	A	007									
	B	007									
<input type="checkbox"/> 300	A	007									
	B	007									
<input type="checkbox"/> 350	A	007									
	B	007									
<input type="checkbox"/> 400	A	007									
	B	007									
<input type="checkbox"/> 450	A	007									
	B	007									
<input type="checkbox"/> 500	A	020									
	B	020									
<input type="checkbox"/> 550	A	020									
	B	020									
<input type="checkbox"/> 600	A	020									
	B	020									
<input type="checkbox"/> 650	A	020									
	B	020									

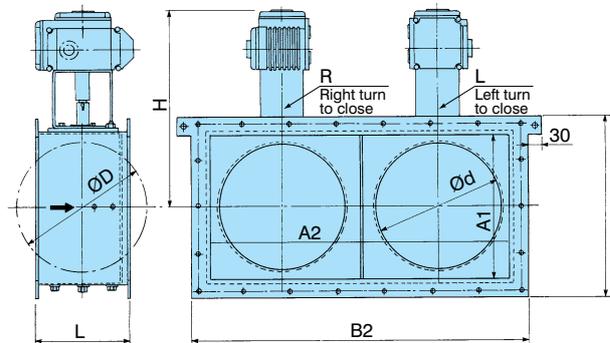
Please contact us if pneumatically operated types are planned.

4 Major Dimensions

Standard Electrical Operation Type



Electrical Operation Twin Type*



Unit: mm

Size **	Ød Port Bore	ØD Disk Dia.	A	B	L	H	Mass (Approx. kg)	Twin			
								A1	A2	B1	B2
200	220	230	255	335	200	413	19	255	535	335	615
250	270	280	305	385		438	21.5	305	635	385	715
300	330	340	355	435	220	463	24	355	735	435	815
350	380	390	405	485	230	488	26.5	405	835	485	915
400	440	450	445	545	260	563	31.5	475	970	545	1070
450	480	490	485	585	270	585	34.5	515	1050	585	1150
500	538	550	605	713	320	624	98	605	1210	713	1318
550	593	605	660	768		651	103	660	1320	768	1428
600	648	660	715	823		679	108	715	1430	823	1538
650	704	716	770	878		706	118	770	1540	878	1648

* A large size twin damper consisting of 2 dampers has a double capacity. Triple damper types are manufactured to order.

** The above table shows the approximate dimensions of rectangular flanges. Round flanges are manufactured to order.

5

Technical Materials

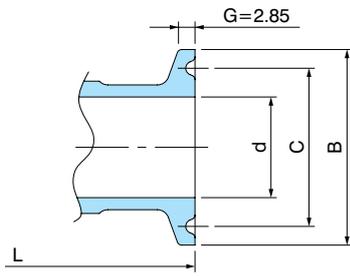
- ① Valve Main Body Dimension List
- ② Inspection Pressure
- ③ Cleaning Specifications
- ④ Valve Stroke and Cv-Value
- ⑤ Pneumatically Operated ON-OFF Actuator Selection Table:
Operation Pressure 0.3 MPa
- ⑥ Product Code Descriptions
- ⑦ Air Chamber Volume and Air Consumption for BPO1400NB (N)
- ⑧ Various Certificates

5. Technical Materials

1 Valve Main Body Dimension List

Stainless Steel Main Bodies

Clamp Joint (Ferrule) NDV Connection Standard Code: ISSC

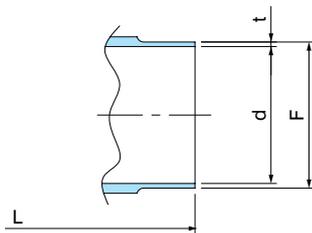


Unit: mm

Nominal DN Size	8	10	15	20	25	40	50	65	80	100
	S				1S	1.5S	2S	2.5S	3S	4S
Face to Face L	90	90	102	118	127	159	191	216	254	305
B	34.0	34.0	34.0	50.5	50.5	50.5	64.0	77.5	91.0	119.0
C	27.5	27.5	27.5	43.5	43.5	43.5	56.5	70.5	83.5	110.0
d	10.5	14.0	17.5	23.0	23.0	35.7	47.8	59.5	72.3	97.6

- B, C, and G are in accordance with ISO2852. B=Ø50.5, C=Ø43.5 are available for DN15 as well.
- d: DN8-20 are in accordance with the bore dimensions of stainless steel pipe for piping (schedule 10S) in JIS G3459. DN25-100 are in accordance with the bore dimensions of stainless steel sanitary pipe for piping in JIS G3447.

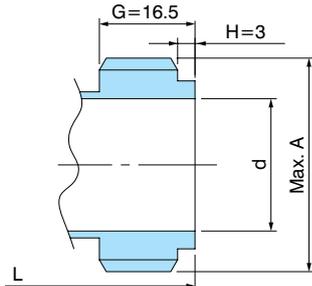
Welded Joint/Astro (TIG) Welding NDV Connection Standard Code: JT



Unit: mm

Nominal DN Size	8	10	15	20	25	40	50	65	80	100
	S				1S	1.5S	2S	2.5S	3S	4S
Face to Face L	80	80	102	118	127	159	191	216	254	305
F	13.8	17.3	21.7	27.2	25.4	38.1	50.8	63.5	76.3	101.6
t	1.65	1.65	2.1	2.1	1.2	1.2	1.5	2.0	2.0	2.0
d	10.5	14.0	17.5	23.0	23.0	35.7	47.8	59.5	72.3	97.6

Union Screw Joint NDV Connection Standard Code: ISSU



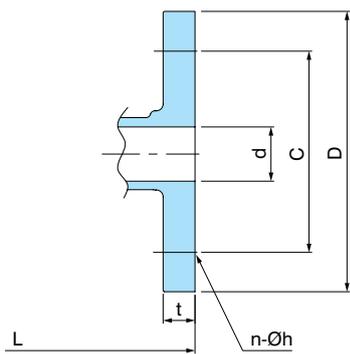
Unit: mm

Nominal DN Size	8	10	15	20	25	40	50	65	80	100
	S				1S	1.5S	2S	2.5S	3S	4S
Face to Face L	—	—	—	—	127	159	191	216	254	305
A	—	—	—	—	37.13	50.65	64.16	77.67	91.19	118.21
d	—	—	—	—	23.0	35.7	47.8	59.5	72.3	97.6

- A, G and H are in accordance with ISO 2852. (Basic Thread Profile: 29° trapezoidal thread, 8 threads/inch)

Flange Joint (JIS 10KFF) NDV Connection Standard Code: J10KFF

<Main Body Material: SUS316L>

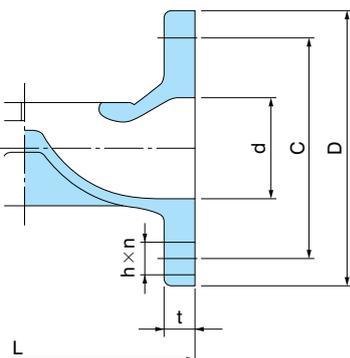


Unit: mm

Nominal Size DN	8	10	15	20	25	40	50	65	80	100
Face to Face L	118	118	102	118	127	159	191	216	254	305
D	90	90	95	100	125	140	155	175	185	210
C	65	65	70	75	90	105	120	140	150	175
d	10.5	14.0	17.5	23.0	23.0	35.7	47.8	59.5	72.3	97.6
h	15	15	15	15	19	19	19	19	19	19
n	4	4	4	4	4	4	4	4	8	8
t	12	12	12	14	14	16	16	18	18	18

- Flanges are in accordance with JIS B2220 (Steel pipe flange, Nominal Pressure 10 K).
- The dimensions L, D, C, h and t for DN8 are identical with DN10.

<Main Body Material: SCS16>



Unit: mm

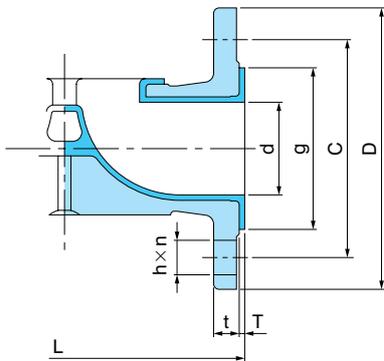
Nominal Size DN	8	10	15	20	25	40	50	65	80	100
Face to Face L	—	—	102	118	127	159	191	216	254	305
D	—	—	95	100	125	140	155	175	185	210
C	—	—	70	75	90	105	120	140	150	175
d	—	—	13	19	25	38	51	64	76	102
h	—	—	15	15	19	19	19	19	19	19
n	—	—	4	4	4	4	4	4	8	8
t	—	—	10	10	10	13	14	14	14	17

- Flanges are in accordance with JIS B2220 (Steel pipe flange, Nominal pressure 10 K). (Flange thickness t is in accordance with Class D of British Standard)

Lined Main Bodies

PFA Lined Flange Joint (JIS 10KRF) NDV Connection Standard Code: J10KRF

<Base Material: SCS13>

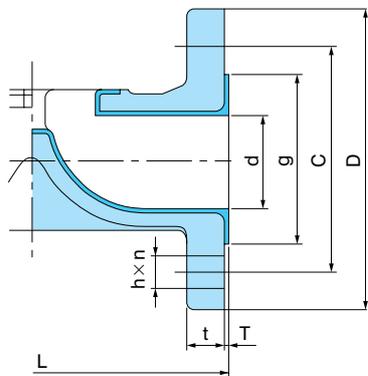


Unit: mm

Nominal Size DN	8	10	15	20	25	40	50	65	80	100
Face to Face L	—	—	107	123	132	165	197	222	260	—
T	—	—	2.5	2.5	2.5	2.5	2.5	3.0	3.0	—
D	—	—	95	100	125	140	155	175	185	—
C	—	—	70	75	90	105	120	140	150	—
d	—	—	13	19	25	38	51	64	76	—
g	—	—	48	52	62	78	89	112	125	—
h	—	—	15	15	19	19	19	19	19	—
n	—	—	4	4	4	4	4	4	8	—
t	—	—	10.5	10.5	10.5	13.5	14.0	14.0	14.0	—

- DN15–65: Material Code 59(2S), DN80: Material Code 59(S)
- Flanges are in accordance with JIS B2220 (Steel pipe flange, Nominal pressure 10 K). (Flange thickness t is in accordance with Class D of British Standard. Dimension T for RF is our company standard.)

<Base Material: FCD-S>

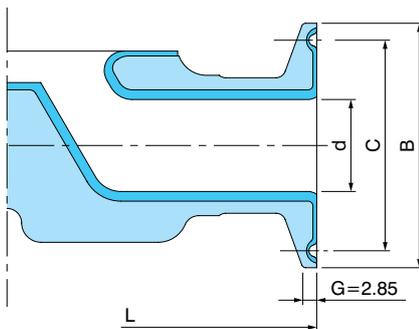


Unit: mm

Nominal Size DN	8	10	15	20	25	40	50	65	80	100
Face to Face L	—	—	107	123	132	165	197	222	260	313
T	—	—	2.5	2.5	2.5	3.0	3.0	3.0	3.0	4.0
D	—	—	95	100	125	140	155	175	185	210
C	—	—	70	75	90	105	120	140	150	175
d	—	—	15	20	25	40	50	64	76	102
g	—	—	48	52	62	78	88	112	125	145
h	—	—	15	15	19	19	19	19	19	19
n	—	—	4	4	4	4	4	4	8	8
t	—	—	13.5	13.5	13.5	16.5	19.0	19.0	19.0	22.0

- Flanges are in accordance with JIS B2220 (Steel pipe flange, Nominal pressure 10 K). (Flange thickness t is in accordance with Class D of British Standard. Dimension T for RF is our company standard.)

ETFE Lined Clamp Joint (Ferrule) NDV Connection Standard Code: ISSC



Unit: mm

Nominal DN Size	8	10	15	20	25	40	50	65	80	100
S	—	—	—	—	1S	1.5S	2S	2.5S	—	—
Face to Face L	—	—	—	—	127	159	191	216	—	—
B	—	—	—	—	50.5	50.5	64.0	77.5	—	—
C	—	—	—	—	43.5	43.5	56.5	70.5	—	—
d	—	—	—	—	17.5	31.5	44.0	55.0	—	—

- B, C, and G are in accordance with ISO2852.

2 Inspection Pressure

Inspections are carried out in accordance with our standards below:

Pressure Inspection	Shell Test: Inspected using N2 gas of 'max. working pressure × 1.2'. Seat Leakage Test: Inspected using N2 gas of 0.6 MPa.
Inspection Duration	Shell Test: DN50 (2S) and smaller—15 sec, DN65 (2.5S) and larger—60 sec Seat Leakage Test: DN50 (2S) and smaller—15 sec, DN65 (2.5S) and larger—30 sec

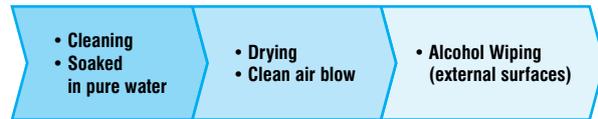
- In addition, an air tightness inspection for pneumatically operated actuator is conducted.
- After pressure inspection, the inside of valve main body is washed with pure water.

3 Cleaning Specifications

Parts Processing Before Assembling



Cleaning after Assembly Inspection



4 Valve Stroke and Cv-Value

Main Body: SUS316L, Diaphragm: New PTFE/EPDM

Nominal Size (DN)	Stroke (mm)	Standard Main Body	Self-Drain
8	4	2.9	3.1
10	4	3.7	4.0
15	6	5.0	4.5
20	8	9.0	9.0
25	10	15.0	12.9
40	14	36.0	32.6
50	20	64.0	52.6
65	24	67.2	—
80	30	127.3	—
100	40	189.9	—

5 Pneumatically Operated ON-OFF Actuator Selection Table: Operating Pressure 0.3 MPa

The actuator for operating pressure 0.3 MPa will be BPO (BPC, BPN) 1400N.

Reverse Acting: BPO1400N

Nominal Size (DN)	New PTFE Diaphragm									
	Working Pressure (MPa)									
	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
15										
20			09B3							
25					12B3					
40										
50				16B3						
65							20B3			
80			20B3				25B3			
100				25B3						

Direct Acting: BPC1400N

Nominal Size (DN)	New PTFE Diaphragm									
	Working Pressure (MPa)									
	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
15										
20			09							
25						12B				
40										
50				12B				16B		
65				16B				20B		
80			20B					25B		
100					25B					

Double Acting: BPN1400N

Nominal Size (DN)	New PTFE Diaphragm									
	Working Pressure (MPa)									
	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
15										
20			07B							
25					09B					
40									12B	
50										16B
65										
80										
100			20B					25B		

6 Product Code Descriptions

Fundamental System of Product Codes: Bio-Clean Diaphragm Valve

B	P0	M	1	4	14	(E1)	NB	-	TX/CE	-	050	-	16	-	ISSC
1	2	3	4	5	6	7	*		8		9		10		11
Operation Type	Ancillary Device	Operation Classification	Valve Type	Main Body Material	Base Material for Lining, Surface Finish, Special Main Body				Diaphragm Material		Nominal Size		Actuator		Connection Standard

1 Type B: Bio-Clean Diaphragm Valves

2 Operation Type

Manually Operated Valve	Blank	Description
	C	Aluminum Handle: BC400
	QL	Quick Open/Close Handle: BQL400N
Pneumatically Operated Valve		
	P0	ON-OFF Valve Reverse Acting (Air to Open / Spring to Close)
	PC	ON-OFF Valve Direct Acting (Air to Close / Spring to Open)
	PN	ON-OFF Valve Double Acting (Air to Open / Air to Close)
	BO	Rolling Diaphragm Control Valve Reverse Acting (Air to Open / Spring to Close)
	BC	Rolling Diaphragm Control Valve Direct Acting (Air to Close / Spring to Open)
Electrically Operated Valve		
	MMA	Electronic Flow Control Valve
	MMB	

3 Ancillary Device

Blank	Description
L	Lock Nut
S	Position Indicator
M	Limit Switch / Special Limit Switch Box
T	Opening Limit Device

4 Operation Classification

Blank	Description
1	Manually Operated Valve
3	Pneumatically Operated ON-OFF Valve
4	Pneumatically Operated Flow Control Valve
4	Electrically Operated Valve

6 Main Body Material Refer to page 10

7 Base Material for Lining, Surface Finish, Special Main Body
(Codes are combined in accordance with specifications)

Base Material for Lining	
2S, M, etc.	6 Main body material codes
Main Body Surface Finish Classifications	
Classification Code	Processes
B1	Inner/outer surfaces: #400 Buffing
B2	Inner surface only: #400 Buffing
B3	Outer surface only: #400 Buffing
B4	Outer surface only: #400 Buffing (burnt color)
E1	Inner surface Electropolishing after #400 buffing on Inner/Outer surfaces
E2	Inner surface Electropolishing after #400 buffing on inner surface
Special Main Body	
F	Self-drain
P	Sampling Valve
K	3-Way Valve
T	Tank Bottom Valve
A-V	Branch Valve: Mounting patterns

(Other than the above will be in accordance with designated materials and types)

8 Diaphragm Material Refer to page 10

9 Nominal Size (DN)
In accordance with ISO 6708
Indication of sizes in inch system (S) are substituted by metric system (DN or A)

10 Actuator
In accordance with selection table

11 Connection Standard

ISSC	Description
JT	Astro TIG Welded Joint
ISSU	Union Screw
VSSC	Special Clamp
J10KFF	JIS 10KFF
J10KRF	JIS 10KRF
A150RF	CL150RF

(Other than the above will be in accordance with designated materials and types)

*** ID Codes for improved products**
No need for selecting a code because automatically determined when a valve is selected.

Blank	Description
N	First Time
N	Improvement: First Time
NB	Improvement: Second Time

5 Valve Type 4: Weir Type Diaphragm Valve: Type 400

Examples of Descriptions

Example of a manually operated valve

B	QL			4	14	(E1P)	N	-	TX/CE	-	025	-		-	ISSC
1	2	3	4	5	6	7	*		8		9		10		11
Bio-clean diaphragm valve	Quick open/close handle	Ancillary Device: None	Manually operated valve	Weir type diaphragm valve	Main body: SUS316L	Main body surface finish: E1 Sampling valve: P			Diaphragm: New PTFE/EPDM		Nominal Size: DN25 (1S)		Actuator Code: None		Ferrule

Example of a pneumatically operated ON-OFF valve

B	P0	T	1	4	59	(2S)	NB	-	TX/CX	-	050	-	16	-	J10KRF
1	2	3	4	5	6	7	*		8		9		10		11
Bio-clean diaphragm valve	Pneumatically operated ON-OFF valve/Reverse Acting (Air to Open / Spring to Close)	Ancillary Device: Opening Limit Device	Pneumatically operated ON-OFF valve	Weir type diaphragm valve	Main body: PFA lining	Base Material for Lining: SCS13			Diaphragm: New PTFE/EPDM + α		Nominal Size: DN50 (2S)		Actuator Code: 16		JIS 10KRF

Above is the coding system for our products. An additional code may be added in accordance with the combination of parts, option, special specifications, etc. Please contact us for any questions regarding the details of product coding.

7 Air Chamber Volumes and Air Consumption of BPO1400NB (N)

	BPO1400NB				BPO1400N			
	Actuator	BPO (Lower Chamber) BPN (Lower Chamber)	BPC (Upper Chamber)	BPN (Upper Chamber)	Actuator	BPO (Lower Chamber)	BPC (Upper Chamber) BPN (Upper Chamber)	BPN (Lower Chamber)
Air Chamber Volume Unit: L	07 (DN15)	0.08	0.1	0.14	16B	1.0	1.1	1.4
	09 (DN20)	0.17	0.21	0.27	20B	2.2	2.7	3.0
	09 (DN25)	0.16	0.22	0.29	25B	3.1	4.7	5.5
	12 (DN40)	0.33	0.55	0.76	—	—	—	—
	16 (DN50)	0.85	1.19	1.62	—	—	—	—
Air Consumption Operating Pressure: 0.4 MPa Unit: NL	07 (DN15)	0.4	0.5	1.1	16B	5.0	5.5	7.0
	09 (DN20)	0.85	1.05	2.2	20B	11.0	13.5	15.0
	09 (DN25)	0.8	1.1	2.25	25B	15.5	23.5	27.5
	12 (DN40)	1.65	2.75	5.45	—	—	—	—
	16 (DN50)	4.25	5.95	12.4	—	—	—	—
Air Consumption Operating Pressure: 0.3 MPa Unit: NL	—	—	—	—	07B	0.4	0.4	0.8
	—	—	—	—	09B	0.8	1.2	1.2
	—	—	—	—	12B	2.0	2.8	2.8
	—	—	—	—	16B	4.0	4.4	5.6
	—	—	—	—	20B	8.8	10.8	12.0
	—	—	—	—	25B	12.4	18.8	22.0

• Above table shows air consumption per 1 open/close operation.

8 Various Certificates

New PTFE Diaphragm: Certificate for Series 4-TX



Certificate of FDA Compliance



Certificate of FDA Compliance



USP Class VI Test Report

PFA Lined Main Body: Certificate for Type 459 New PFA



Certificate of FDA Compliance



Certificate of FDA Compliance

Please contact us for details of publication.

6

Safety Instructions

SAFETY INSTRUCTIONS

1. Cautions for Selecting the Valve

① Products described in this catalog have respective range of application specified according to the official standards and our own standard. Customers are requested to check on your conditions for usage (fluid, pressure, temperature, etc.) before selecting an optimum product.

② Select the material for the main body (lining), diaphragm, bonnet, compressor, base and other depending on the fluid you are to handle. As to the materials for the main body (lining) and diaphragm, please refer to the material selection table in the catalog or contact us.

Please note that certain types and sizes of bonnet, compressor, base, etc. are standard manufactured using aluminum alloy. Optionally these products are also manufactured using steel material (FC200, SCS13, etc). When handling some liquid that erodes aluminum alloy, using steel material is recommended for the sake of safety. Please discuss this matter when placing orders.

2. Cautions at Receiving and During Delivery

① Upon receipt of valves, check that the product and quantity are as ordered. Also check if the package and packing are undamaged.

② Certain items weigh heavy. When unloading or delivering the product, mind the safety by using an appropriate hoisting machines, etc. in conformity to Occupational Safety and Health Act or equivalent law. Never enter directly below a hoisted product package or operate the hoist from under the raised package.

③ If wetted, cardboard boxes may lose packing strength. In such a case, handle them with utmost care.

3. Cautions for Storage

① A dustproof cap is attached to the connecting ends and ports for prevention of dust or dirt in the valve. Furthermore, the whole valve is covered with a dust proof bag for the purpose of sustaining the effects of cleaning treatment.

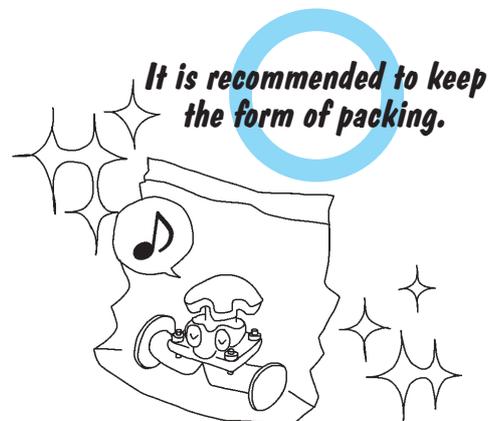
After having taken out a valve from package, do not remove the dust proof bag and dust proof cap until immediately before installation.

Any foreign substances entered in a valve will be a cause for malfunction if bitten between main body and diaphragm, and further extremely deteriorates the quality of surface finish and cleaning treatment of main body.

② The buffing finish is applied on the surfaces of some of the valve main bodies and bonnets. Please pay attention not to damage valve surface during handling of a valve for conveying, etc.

③ To prevent the valve from rust or rubber and plastic material from degradation, store the valve in the following conditions:

- ① Keep away from the rainwater.
- ② Keep away from direct sunlight.
- ③ Keep it at the ambient temperature of 60°C or lower.
- ④ Keep away from high humidity and dusty atmosphere.



4. Cautions for Installation to the Piping

① Remove a cap covering the connecting ends or flanges of main body, and check for no stain inside or adhesion of foreign substances. Further check for cleanliness and absence of foreign substances in the pipeline for implementing a valve, and carryout gas blowing or liquid flushing as necessary.

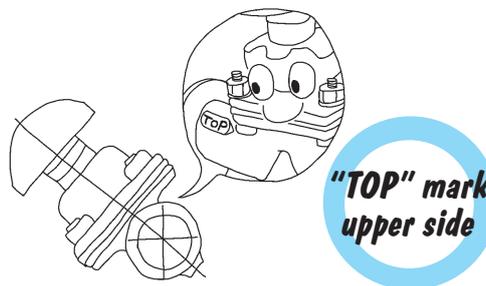
Any foreign substances entered in a valve will be a cause for leakage if bitten between main body and diaphragm.

- 2 Provide a space around the valve necessary for overhauling. Such a space should allow to replace the diaphragm with the main body remaining connected to the piping. Particularly, when hoisting the bonnet, necessary space must be provided for the hoisting operation.
- 3 When installing the valve to the piping, prevent it from receiving abnormal tension, compression or bending stress.
- 4 Use a gasket contacting the full surface of flange for a flat face flange.
- 5 For connection to the piping, use the bolts of a length that makes no contact with the bonnet flange or use continuous thread studs and adjust the length of the protruding head of the stud. Tightening the bolt in contact with the bonnet flange may cause external leakage or damage the bonnet, causing the valve failure.

Particular care is required to the contact of the bonnet flange with the piping bolt when installing a valve of DN15 to 80 to the piping. Users are recommended to use a double-end stud for the piping bolt and the nut of Style 1 (JIS B 1181), Class 1 or 2 (JIS B 1181 Attachment 1).

Make adjustment to prevent contact between the bonnet flange and the piping bolts. Adjustment position should read a position where the end face of the bolt is flush with the end face of the nut. (Select a bolt so that the fit length of the thread will be definitely at least 80% or higher of the height of the nut.)

- 6 When installing the valve to the piping, tighten individual bolts alternately and diagonally under identical torque. Unevenly clamped bolts may cause leakage from the connecting flange face.
- 7 Pay attention not to let the washing water, etc., in the products with air vent (pneumatically operated or electrically operated valves).
- 8 Pay attention not to let the washing water, etc., in actuator if a quantity of washing water, etc., will splash on valves.
- 9 When attaching a valve on a horizontal pipework, install a valve with "TOP" mark upper side (see right figure) and inclined with a certain angle for preventing the fluid from remaining in the valve. Additionally, if a slope is given on the pipework, less fluid will remain and the self-drain effect will be better.
- 10 When a valve with Ferrule joint connection is to be used, add a support for prevention of rotation because the clamp may be loosened due to the rotational force from the weight of actuator and the valve may be rotated.



- 11 For a Ferrule joint, the fastening of clamp shall not be tighter than a strong tightening with a hand. Tightening using a tool, etc., excessive tightening or overload of piping will deform gaskets and will cause leakage or fluid accumulation.

If leakage occurs during use, discharge the pressure in the pipeline and retighten.

If the leakage will not stop, replace the gasket.

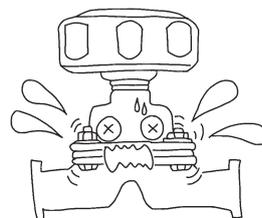
5. Cautions for Machine Operation

- 1 Opening/closing the valve with part of an operator's body or wear carelessly in contact with the moving parts inside or outside of the valve may lead to a serious injuries. Never touch the inside or moving parts of the valve.
- 2 When opening/closing the valve, don't operate the handwheel by hooking an auxiliary pipe or wrench on it. Or an excessive load will be applied to the valve component possibly to damage it.
- 3 When operating the handwheel to close the valve, stop the closing operation at maximum 15 to 20 degrees after sensing the valve resistance to the closing motion. Excessive tightening may cause a shorter diaphragm life. Particular care is required when handling a fluid in high temperature.
- 4 If the handwheel operation is felt heavier in the middle of a valve closing operation, certain foreign matters might have been caught with the valve seat. In such a case, open the valve once, let the fluid flow through, and check if the foreign matters are washed away, then start the closing operation again.
- 5 If ambient temperature or fluid temperature changes greatly while the fluid is sealed inside the piping, thermal expansion of the

fluid causes the pressure to change, possibly leading to external leakage or damaged diaphragm.

In addition, if the valve is operated to open/close while the valves before and after the diaphragm valve are closed and the inside fully filled with the fluid, the same phenomenon may occur, for which care should be taken.

- ⑥ If the fluid fully inside the valve is frozen, the valve may be freeze-fractured. For application in an environment where freezing may likely happen, take anti-freeze measures by providing the piping with thermal insulation or if the valve is not in use, to extract liquid from inside the valve, etc.
- ⑦ Rubber is used for the material of diaphragm. The nuts that clamp the diaphragm may be loosened due to vibration during transportation or stress relaxation after a long period of operation. In such a case, render the diaphragm unloaded by nullifying the fluid pressure, then apply prescribed torque to tighten the nuts to the required level.
- ⑧ Pay attention on following items when wiring is worked.
 - ① When closing the switch cover, check for the completeness of gasket and clean up the mating surfaces and securely tighten the fastening bolts.
 - ② Securely work not to allow the wash water, etc., to come in from the external lead wire port.
 - ③ Do not leave a switch cover opened.
 - ④ Absolutely avoid wiring work in rainfall when installing outdoors.
 - ⑤ Be sure to check the functioning after wiring work.

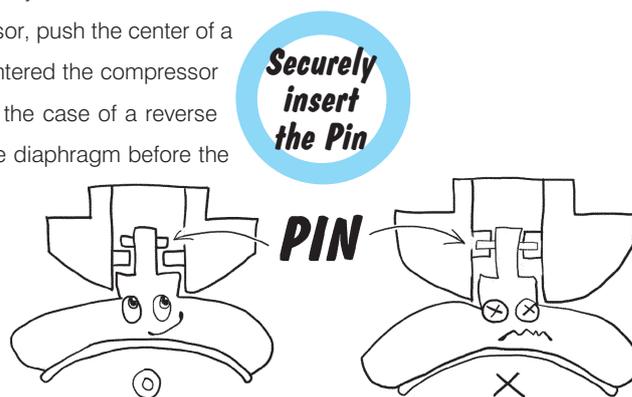


6. Cautions for the Actuators of Pneumatically, Electrically Operated Valve

- ① Protective sealing (cap) is provided to the air intake port and the electric wiring connection port. Don't remove the sealing (cap) until the connection joint is installed.
- ② Actuators are shipped factory-adjusted. Don't disassemble and reassemble them. If any adjustment is required, please contact us.
- ③ Dehumidify the air and filter it clean before leading to the valve for application.
- ④ For the operating pressure and power supply, see the nameplate or the specifications of delivered product.
- ⑤ Pay attention not to allow wash water, etc., to come in from the air breathing port of product.

7. Cautions for Disassembly and Assembly

- ① When removing or disassembling the valve, ensure the following matters or you may be risking a serious hazard:
 - ① The object valve should have been separated from other piping.
 - ② The fluid pressure and temperature inside the piping and the valve should be atmospheric and normal.
 - ③ There remains no residual fluid inside the piping, and no fluid leakage occurs when the mounting bolts and nuts are loosened.
- ② Provide maintenance work for the diaphragm and actuator periodically.
 - ① PTFE diaphragm is of a bayonet type. To install to the compressor, push the center of a diaphragm firmly with fingertips. Ensure that the pin has fully entered the compressor before turning it 90 degrees clockwise or counterclockwise. In the case of a reverse seat type diaphragm, turn it over before installation. Turning the diaphragm before the pin fully enters the compressor may damage the pin.
 - ② When reassembling to the valve, run centering, and tighten the bolts and nuts evenly by applying prescribed torque.
 - ③ For detailed maintenance instructions, see the instruction manual or contact our Sales Dept. or local representative.



- The ISO 9001 · 14001 certificate was awarded



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 Bio-Clean Diaphragm 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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