

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

Bio-Clean Diaphragm Valves

Manually Operated Valves



Stainless Steel Handle
B400N
DN8-100



Aluminum Handle
BC400
DN15-50



Quick Open/Close Handle
BQL400N
DN8-80

Pneumatically Operated ON-OFF Valves



BPO (PC, PN) 1400NB
DN15-50



Opening Limit Device



with Special Limit Switch Box



BPO (PC, PN) 1400N
DN65-100

Pneumatically Operated ON-OFF Valves (Stainless Steel Actuator)



BPO (PC, PN) 1400N
DN8-10



BPO (PC, PN) 1400N
DN15-50

Product List

○: Standard ☆: Option —: Not Applied

Bio-Clean Diaphragm Valve Series

		Standard 2-Way Valves				Valves for Dead Spaces					Special Valves***	
		Stainless Steel Body		Lined Body		Self-Drain			Sampling Valve	3-Way Valve	Tank Bottom Valve	Branch Valve
		B414	B413	B459 (2S)/(S)	B459 (M)	B460 (S)	B414 (F)	B413 (F)	B459 (F)	B414 (P)	B414 (K)	B414 (T)
Simplified Code		SUS316L Forged		SCS16 Precision Cast	SCS13 +PFA Lining	FCD-S +PFA Lining	SUS316L Forged	SUS316L Forged	SCS16 Precision Cast	SCS13 +PFA Lining	SUS316L	SUS316L
Main Body Material		DN 8-100		DN 8-50	DN 15-80	DN 15-100	DN 25-65	DN 8-50	DN 65-100	DN 15-50	DN 15-100	DN 15-50
Standard Nominal Size Range*		8-100		8-50	15-80	15-100	25-65	8-50	65-100	15-50	15-100	15-50
Connection Standard	ISSC	○		○	—**	—	○	—	○	—	○	—
	JT	☆		☆	—	—	—	—	☆	—	☆	—
	J10KFF (RF)	☆		☆	○	—	—	—	☆	—	☆	—
	ISSU	☆		—	—	—	—	—	☆	—	☆	—
Main Body Surface Finish Classification	B1	☆		○	—	—	—	—	☆	—	○	—
	B2	○		—	—	—	—	—	○	—	—	—
	B3	☆		—	☆	Painted Outer Surface	☆	☆	☆	—	☆	—
	B4	—		—	☆	Surface (white)	☆	—	—	☆	—	—
Diaphragm	TX/CE	☆		—	—	—	—	—	☆	—	☆	—
	TX/CX	☆		—	—	—	—	—	☆	—	☆	—
Operation Type	Manual	☆		—	—	—	—	—	○	—	○	—
		☆		—	—	—	—	—	☆	—	☆	—
	Auto	☆		—	—	—	—	—	☆	—	☆	—
		☆		—	—	—	—	—	☆	—	☆	—

* 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.

Bio-Clean Diaphragm Valves

1-1. Features of Bio-Clean Diaphragm Valves

1-2. Standard Specifications

- ① Valve Main Body Specifications
- ② Diaphragm Specifications
- ③ Working Temperature Range and Max. Working Pressure

1-3. Manually Operated Valves

- ① Handle Specifications: B400N, BC400 (B400NB), BQL400N
- ② Major Dimensions

1-4. Pneumatically Operated ON-OFF Valves (Standard): BPO1400NB(N)

- ① Features of Actuator
- ② Actuator Selection Table
- ③ Major Dimensions

1-5. Pneumatically Operated ON-OFF Valves (Stainless Steel Actuator): BPO1400N

- ① Features of Actuator
- ② Actuator Selection Table
- ③ Major Dimensions

1-1. Features of Bio-Clean Diaphragm Valves

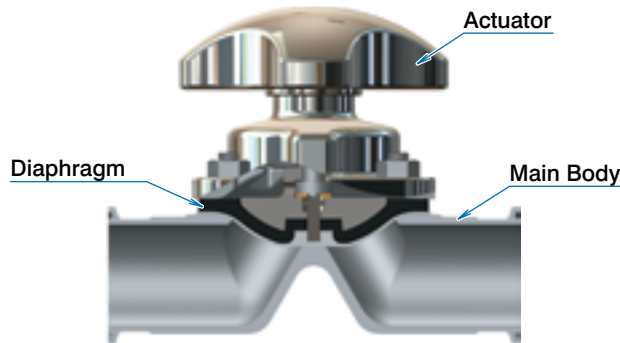
Optimum valves for manufacturing equipment for medicine, bioprocesses, cosmetics, foods and semiconductors

1 Excellent Air-tightness

- A highly airtight structure perfectly separating the fluid and actuator by a diaphragm. The structure (Packless) that does not require a gland packing with high possibility of leakage as a general valve, is excellent for maintaining air tightness and prevention of contamination by various bacteria.

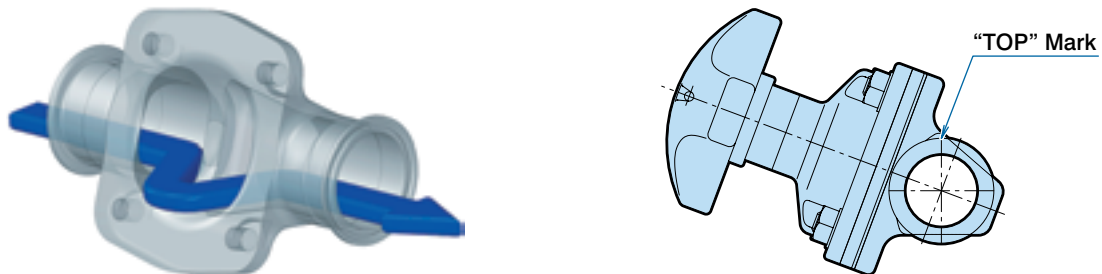
2 A Structure not Contaminating the Fluid

- The flow path consists only of main body and diaphragm and is an optimum structure preventing the contaminant materials or lubricants from contacting the fluid.
- The valve seat sealing method to press the diaphragm to the weir of main body does not require the rotational parts or sliding parts required for ball valves and butterfly valves, accordingly almost no abrasion particle is expected.



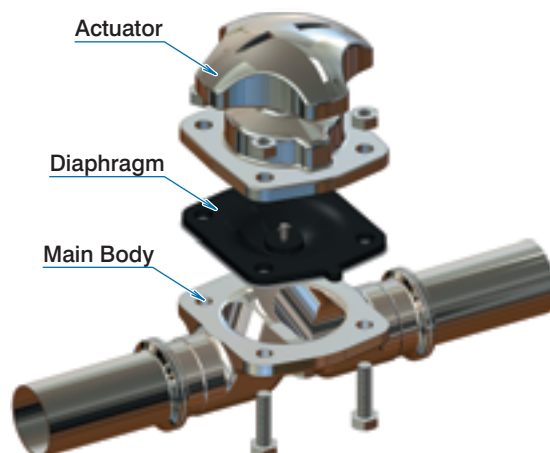
3 Excellent Washability

- The streamlined flow path eliminating the dead space (pockets or fluid accumulation) is excellent in washability and is a superior structure for CIP (cleaning in place) or SIP (sterilization in place) for its effectiveness and washing time.
- When attaching a valve on a horizontal pipework, installation with "TOP" mark in upper side will prevent the fluid, rinse solution, etc., from remaining inside.



4 Excellent Maintainability

- A simple structure of diaphragm valve consisting of only three units "Actuator", "Diaphragm" and "Main Body"
- Disassembling is just to remove the bolts and nuts fastening the "Actuator", "Diaphragm" and "Main Body" and that provides the excellent maintainability. In addition, the top-entry structure allows the maintenance work without removing the valve body from piping.
- As one of the features of diaphragm valves, the original performance will be restored by replacing the diaphragm by new parts.
- The standard exchangeability of various units will provide the ease of changing actuators.

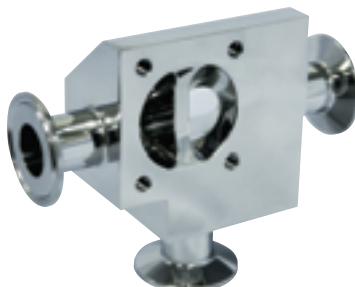


5 Manufacturing of Valve Main Unit Tailored to Applications and Specifications

- The streamlined flow path for main body made of stainless steel is buff finished (#400) and that allows further electropolishing facilitating the prevention of fluid accumulation, prevention of adhesion of substances in the fluid, and the improved washability. The outside surface of main body and actuator are ground as designated.
- A pocket free compact special shape for sampling valves, 3-way valves, and tank bottom valves are available while preserving the features of bio-clean diaphragm valves as they are.
- The tailored manufacturing for fitting various joints such as ferrule joint (clamp joint) or welded types used in the fields of medical drugs, bio processes, semiconductors, etc., are available.



Sampling Valve: Type-P



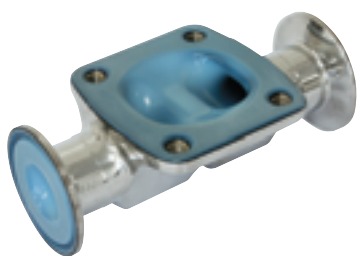
3-Way Valve: Type-K



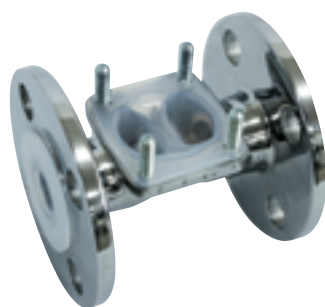
Tank Bottom Valve: Type-T

6 Products Excellent for Corrosion-Proof and Chemical Resistance

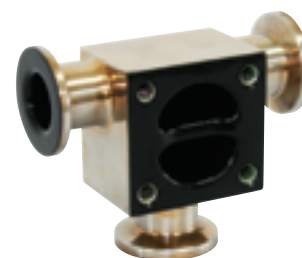
- The valve main bodies with optimum lining for countermeasures for corrosive fluids, crevice corrosion, and metal ion elution for sanitary pipework are available.
- The "New PFA" applied for PFA lined main body conforms to the FDA of the USA and Food Sanitation Act of Japan.
(Ref. ⑧ Various Certificates in 5. *Technical Materials*)



SUS316L + ETFE Lined Main Body
(Clamp Connection)



SCS13 + PFA Lined Main Body
(Flange Connection)



SUS316L + PFA Coated Main Body
Sampling Valve: Type-P
(Special Clamp Connection)

7 Sanitary Specification Diaphragms

- High-quality and safe sanitary specification diaphragms developed based on our knowledge cultivated through the years of manufacturing of diaphragms.
- Our New PTFE diaphragm is approved by the FDA in the USA* as safe for contacting use for food processing, cooking, etc.
- Conforming to USP (US Pharmacopeia) Class VI**
- Conforming to the standards and criteria of Food Sanitation Act of Japan.

* Food and Drug Administration, HHS 21 CFR Ch.1 (4-1-94 Edition) §177, 1550
(HHS: Department of Health and Human Services)
(CFR: Code of Federal Regulations)

** The conformance is recommended in ASME BPE (Bio Processing Equipment), "POLYMER" construction materials used for contacting surfaces with product material (contacting surface with product and fluid).

(Ref. ⑧ Various Certificates in 5. *Technical Materials*)



8 Environment Friendly

- Environment friendly paints are used for coating of actuator for bio-clean diaphragm valves.
- Diaphragm valves have less number of parts compared to other valve types owing to a simple unit structure; accordingly, there is no waste of wearing parts.

9 Integrated Manufacturing System in Clean Room

Bio-Clean Diaphragm Valves are manufactured in the clean room with processes "1. Cleaning of fluid contacting parts", "2. Assembly", "3. Inspection" and "4. Packing" and finished to a clean product and delivered to the customers.

1-2. Standard Specifications

1 Valve Main Body Specifications

Stainless Steel Body

Manufactured Main Bodies			Connection Standard and Manufacturing Range			
Name	Main Material	Material Code	Ferrule	Astro (TIG) Welding*	Union Screw*	Flange*
			Nominal Size (DN)	Nominal Size (DN)	Nominal Size (DN)	Nominal Size (DN)
Stainless Steel Forged	SUS316L	14	8-100	8-100	25-100	8-100
Stainless Steel Cast	SCS16	13	8-50	8-50	—	15-100

* Option

Main Body Surface Finish Classification

Please designate from table below:

Classification Code	Process
B1	#400 Buffing: Inner/Outer Surfaces
B2	#400 Buffing: Inner Surface*
B3	#400 Buffing: Outer Surface*
E1	Inner Surface Electropolishing after #400 Buffing on Inner/Outer Surfaces*
E2	Inner Surface Electropolishing after #400 Buffing on Inner Surface*

* For main bodies of forged stainless steel only



Standard Main Body (Ferrule)

Lined Main Bodies

Manufactured Main Bodies			Connection Standard and Manufacturing Range	
Name	Base Material	Material Code	Ferrule	Flange
			Nominal Size (DN)	Nominal Size (DN)
PFA Lining ★	SCS13	59 (2S)/59 (S)	—	15-80
	FCD-S	59 (M)*	—	15-100
ETFE Lining ★	SUS316L	60 (S)	25-65	—

* Standard external painting (white)

• PFA Lining: The lining material "New PFA" conforms to FDA of the USA and Food Sanitation Act of Japan. (Ref. ® Various Certificates in 5. Technical Materials)

★: 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.



PFA Lining (Flange)

Main Body Surface Finish Classification (Option)

Please designate from table below:

Classification Code	Process
B3	#400 Buffing: Outer Surface (Burnt Color)
B4	#400 Buffing: Outer Surface (No Burnt Color)

(For base material FCS-S: White painting for standard external painting, no grinding)

Detailed Dimensions of Main Body

In accordance with P. 42 "Valve Main Body Dimension List"

Others

PFA Lining: Please contact us for special clamp connection types.

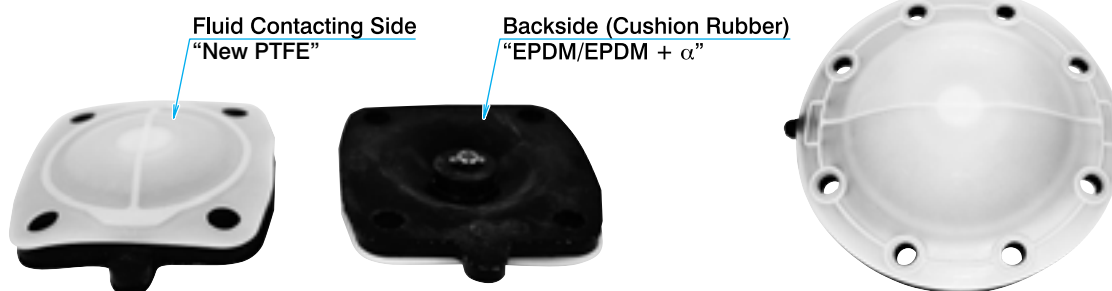
P.28



ETFE Lining (Ferrule)

2 Diaphragm Specifications

The “New PTFE” diaphragm is adopted for fluid contacting side, and the cushion rubber (EPDM or EPDM + α) is applied for the backside for improved sealing performance of valve.



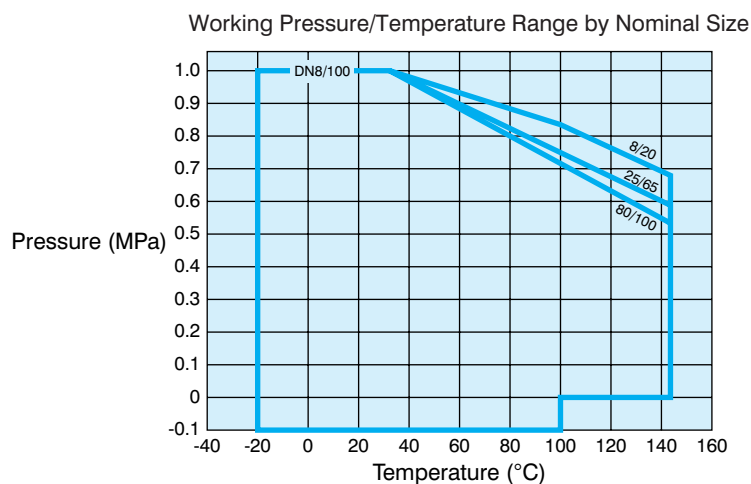
Diaphragm/Cushion Rubber Material	Material Code	Nominal Size (DN)	Working Temperature Range	Max Working Pressure
New PTFE/EPDM	TX/CE	8–100	-20–143°C	1.0MPa
New PTFE/EPDM + α	TX/CX	8–100	-20–151°C	1.0MPa

- EPDM + α is developed by our company for enhanced thermal durability of EPDM.
- Our “New PTFE” diaphragm conforms to FDA of the USA, USP class VI and Food Sanitation Act of Japan. (Ref. ⑧ Various Certificates in 5. *Technical Materials*)
- Option: Fluorine Cushion Rubber, Hastelloy Diaphragm Fixing Bayonet Pin

3 Working Temperature Range and Max. Working Pressure

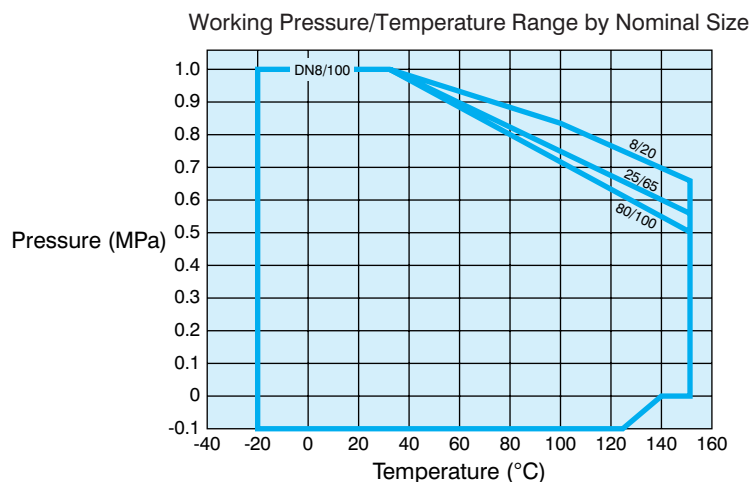
New PTFE/EPDM (TX/CE), Stainless Steel · PFA Lined Main Body*

Working Temperature Range: -20–143°C



New PTFE/EPDM + α (TX/CX), Stainless Steel · PFA Lined Main Body*

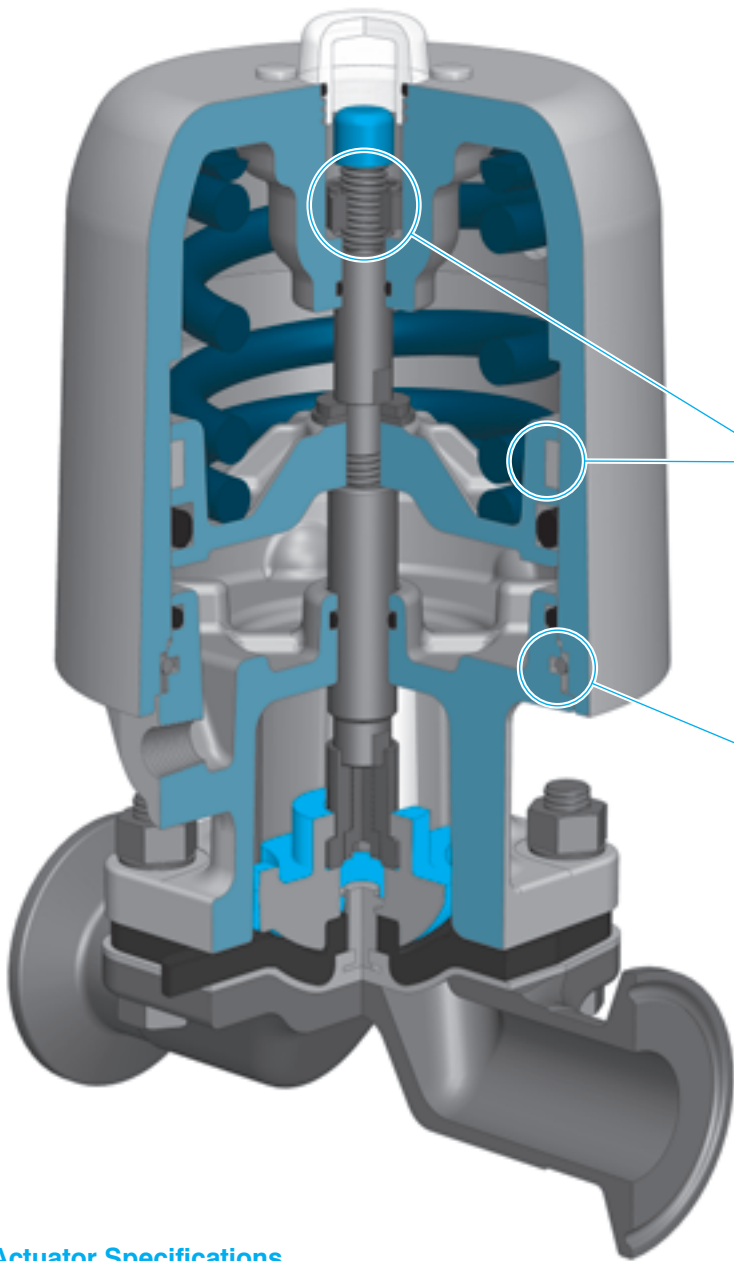
Working Temperature Range: -20–151°C (max. working temperature for continuous use)



* Lower limit temperature for PFA lined main body made of base material FCD-S is -10°C

1-4. Pneumatically Operated ON-OFF Valves (Standard): BPO1400NB (N)

1 Features of Actuator (BPO1400NB)



Significantly Light Weight, Compactness

- Comparison with our conventional product (BPO1400N)
- Mass: Max. weight reduction of approx. 13%!
 - Height: Max. compactification of 22%!
 - Outer Diameter: Max. compactification of 18%!
 - Air Consumption: Max. air saving of 20%!

Significantly Improved Smoothness of Action and Durability

- The adopted outer wear ring for the piston provides the smoothness of action to significantly enhance the durability.
- The adopted stopper nut prevents the excessive loading on diaphragm

Excellent External Shape for Cleaning

- The adopted retaining ring for fixing the bonnet and cylinder and the built-in exhausting plug improve the cleanability owing to the extreme reduction of surface roughness of actuator.

Eco-Friendly Paint

- Eco-friendly paint is adopted for the white baked finishing for the actuator surface. (The corrosion proof performance of this paint was confirmed through the dip tests performed using various CIP liquid and washing agents.)

Bio-Clean Diaphragm Valves
Pneumatically Operated ON-OFF Valves

Products for Dead Spaces

Special Valves · Related Products

Sanitary Valves · Clean Room Related Products

Technical Materials

Safety Instructions

Actuator Specifications

Types	BPO (BPC, BPN) 1400NB (N)*
Actuator Code	07, 09, 12, 16, 16B, 20B, 25B*
Types of Operation	Single Acting: Reverse Acting BPO (Air to Open / Spring to Close) Direct Acting BPC (Air to Close / Spring to Open) Double Acting: BPN (Air to Open / Air to Close)
Nominal Size (DN)	15–100*
Actuator Materials	Cylinder: ADC12 Bonnet: ADC12 (SCS13A for BPO1400N) Standard Painting: White thermal curing acrylic resin paint (eco-friendly) baked finish
Operating Pressure	0.4 ^{+0.1} MPa • Option: 0.3 ^{+0.1} MPa**
Max. Shutoff Differential Pressure	1.0MPa
Lubricants	Cassida Grease HDS2 (Standards regarding food additives: FDA21CFR178.3570. Lubricants with permission of incidental contact with food: NSF Class H1 conforming product)
Options***	Opening limit device, Special limit switch box (Eco-friendly type, white baked finish)

* DN65–100 are equipped with BPO1400N-16B-25B. The basic specifications, such as action performance with wear ring, corresponding options are the same.

** The 0.3 MPa actuator is equipped with BPO1400N. Please refer to page 44 for the actuator selection table.

*** The commercially-supplied accessories may be attached as requested. Please contact our sales dept. or local representative for the details.

