



Truly drain-free valves

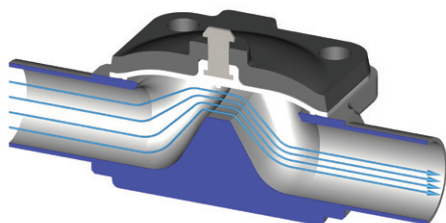
*BSW SERIES*

# ***WEIRLESS DIAPHRAGM VALVES***

# Features

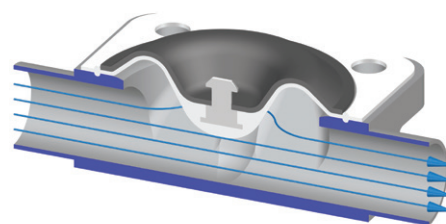
## Flow path shapes

Weir type



- Flow path narrows in the weir section.
- Flow rate is around 50% of the Cv value of the piping.

Weir-less type

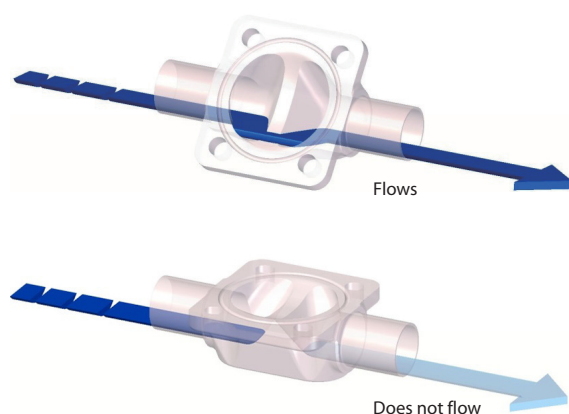


- Flow path is straight.
- Flow rate is at least 80% of the Cv value of the piping.

## Free piping orientation

$\pm 0^\circ$

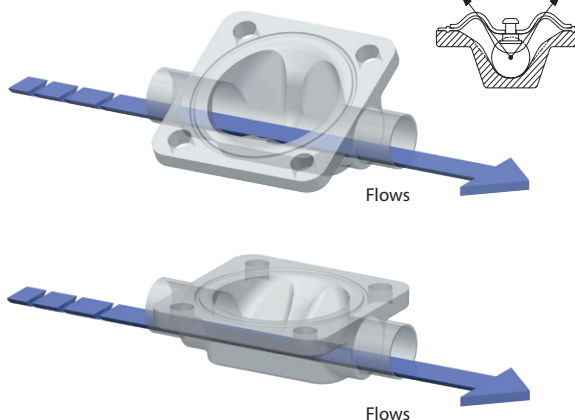
Self-draining pipe (with specified angle)



- If piping is arranged at the specified angle, liquid retention within piping can be minimized.
- Piping angle must be kept precise, so piping installation is more difficult than with straight valves.

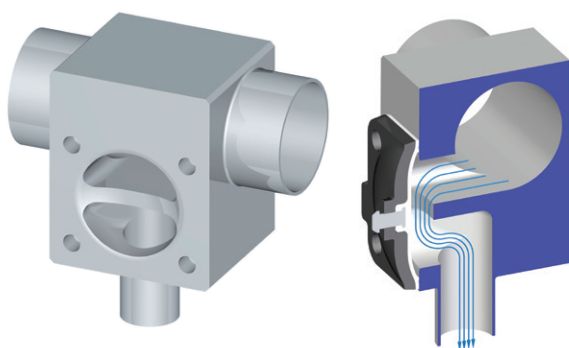
$\pm 50^\circ$

Self-draining pipe (no specified angle)

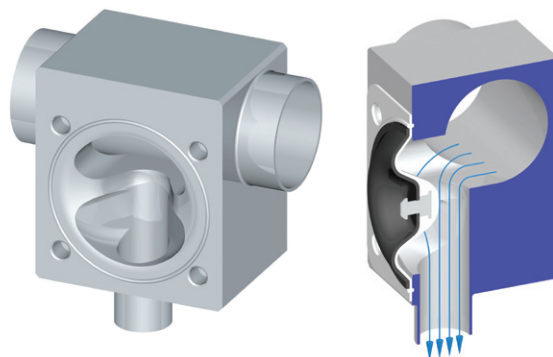


- Liquid retention within piping can be minimized with horizontal and vertical piping.
- Angling of valve is unnecessary, so piping design and installation is simple.

## T-shaped branching valve structure

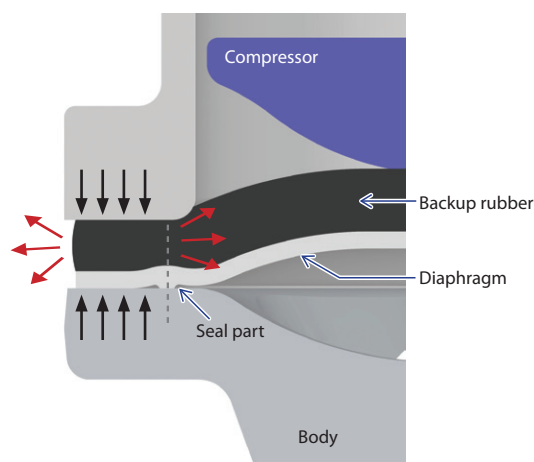


- Flow path narrows in the weir section.
- Pressure loss in the branching section is increased.

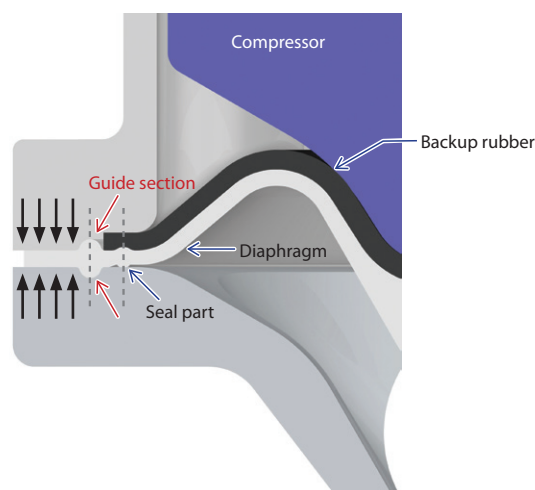


- Flow path is straight.
- Pressure loss in the branching section is decreased.

## Seal structure



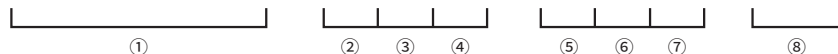
- Precise torque control to avoid deformation and loosening is required to fasten thick backup rubber.
- Thick backup rubber is effective in absorbing slight body variations, but using thick rubber has disadvantages that include poor high temperature resistance and proneness to loosening.



- Thin fluorine-based rubber is used for the backup rubber, so high temperature resistance is good and loosening is not prone to occur.
- Diaphragm is provided with a two-layer touch line (protruding section). The outer line serves as a guide for the body and the actuator, while the inner line serves to stop the fluid. This structure maintains outstanding airtightness and durability.

## Part number format

# BSWCN - A 1 - 7 F A -



	①	②	③	④	⑤	⑥	⑦	⑧	Details		
type	BSW								Manual type		
	BSWCN								Spring-back type (normally closed type) [N.C.]		
	BSWON								Spring-back type (normally open type) [N.O.]		
	BSWDN								Double-action type [D.A.]		
Actuator material		A							Aluminum		
Diaphragm material*1			1						PTFE/FKM		
Body material				No					SUS316L		
Connection type					1				Threaded		
					2				Flange*2		
					5				BW (butt weld)		
					7				Clamp type		
					9				Union		
Connection size									Clamp type, BW	Flange	Threaded
						B			8A	-	1/4B
						D			15A	15A	1/2B
						F			25A (1S)	25A	1B
Piping standards							No		ISO/IDF		
							A		ASME		
Other									Abbreviations are inserted for special products.		

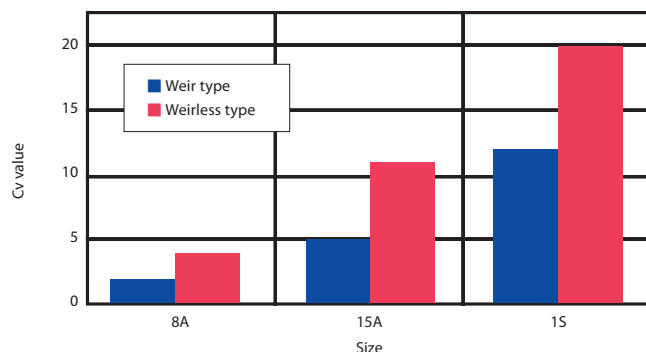
\*1: Standard diaphragm material is PTFE/FKM (fluorine-based rubber) \*2: JIS10K flange connection

### Specifications

Nominal diameter	Maximum working pressure	Working fluid temperature range	MAX Cv value	Pneumatic actuator		
				Operating pressure	Connection port	Operation type
8A	0.6 MPa	0–150°C	4	0.4–0.7 MPa	Rc 1/8	N.C.
15A			11			
25A (1S)			20			

### Material

Component name	Material
Body	SUS316L (#400 buffing + electropolishing)
Diaphragm	PTFE/FKM (fluorine-based rubber)
Actuator	ADC12 (PTFE coating)



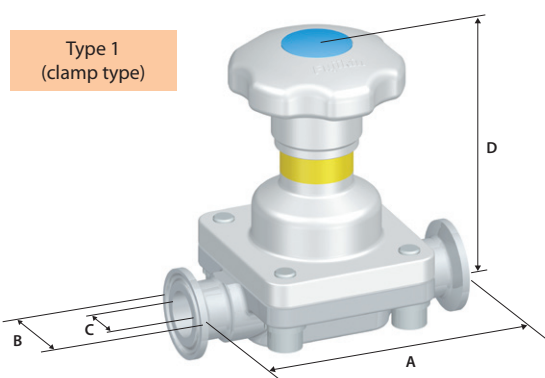
Size	BNW series (weir type)	BSW series (weirless type)
6.35 mm		0.6
8A	2.8	4
10A	2.9	
15A	6.2	11
25A (1S)	13	20



## Primary product dimensions

### Manual valves

Clamp type and butt weld type (nominal diameter: 8A–25A (15), 1/4"–1")



Type 1  
(clamp type)

Units (mm)						
type	Size	A	B	C	D	Part No.
1 (clamp type)	8A	90	34	10.5	86	BSW-A1-7B
	15A	108	34	17.5	102	BSW-A1-7D
	15	127	50.5	23	121	BSW-A1-7F

Units (mm)

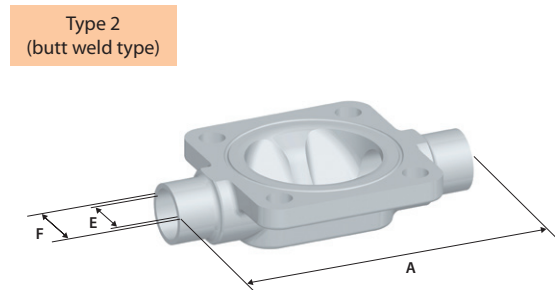
type	Size	A	B	C	D	Part No.
1 (clamp type)	1/4"	89	25	4.6	89	BSW-A1-7BA
	3/8"	89	25	7.7	87	BSW-A1-7CA
	1/2"	89	25	9.4	86	BSW-A1-7DA
	3/4"	102	25	15.8	103	BSW-A1-7EA
	1"	114	50.5	22.1	121	BSW-A1-7FA

Units (mm)

type	Size	A	D	E	F	Part No.
2 (butt weld type)	8A	75	86	10.5	13.8	BSW-A1-5B
	15A	108	102	17.5	21.7	BSW-A1-5D
	20A	127	121	23	27.2	BSW-A1-5E
	15	127	121	23	25.4	BSW-A1-5F

Units (mm)

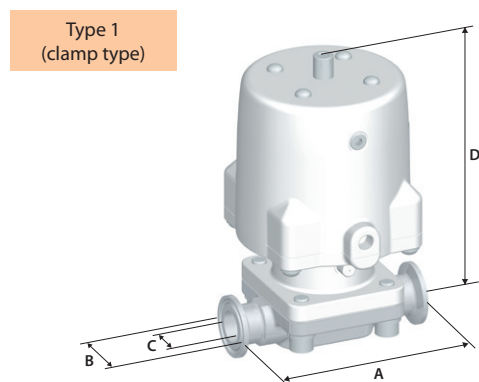
type	Size	A	D	E	F	Part No.
2 (butt weld type)	1/4"	89	89	4.57	6.35	BSW-A1-5BA
	3/8"	89	87	7.75	9.52	BSW-A1-5CA
	1/2"	89	87	9.4	12.7	BSW-A1-5DA
	3/4"	102	102	15.75	19.05	BSW-A1-5EA
	1"	114	121	22.1	25.4	BSW-A1-5FA



Type 2  
(butt weld type)

### Automatic valve (spring-back normal close type (N.C.))

Clamp type and butt weld type (nominal diameter: 8A–25A (15), 1/4"–1")



Type 1  
(clamp type)

Units (mm)						
type	Size	A	B	C	D	Part No.
1 (clamp type)	8A	90	34	10.5	115	BSWCN-A1-7B
	15A	108	34	17.5	150	BSWCN-A1-7D
	15	127	50.5	23	201	BSWCN-A1-7F

Units (mm)

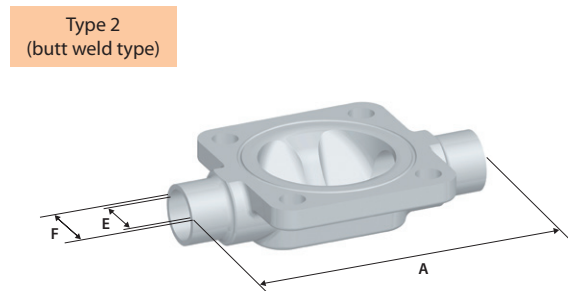
type	Size	A	B	C	D	Part No.
1 (clamp type)	1/4"	89	25	4.6	120	BSWCN-A1-7BA
	3/8"	89	25	7.7	118	BSWCN-A1-7CA
	1/2"	89	25	9.4	118	BSWCN-A1-7DA
	3/4"	102	25	15.8	150	BSWCN-A1-7EA
	1"	114	50.5	22.1	201	BSWCN-A1-7FA

Units (mm)

type	Size	A	D	E	F	Part No.
2 (butt weld type)	8A	75	115	10.5	13.8	BSWCN-A1-5B
	15A	108	150	17.5	21.7	BSWCN-A1-5D
	20A	127	201	23	27.2	BSWCN-A1-5E
	15	127	201	23	25.4	BSWCN-A1-5F

Units (mm)

type	Size	A	D	E	F	Part No.
2 (butt weld type)	1/4"	89	120	4.57	6.35	BSWCN-A1-5BA
	3/8"	89	118	7.75	9.52	BSWCN-A1-5CA
	1/2"	89	118	9.4	12.7	BSWCN-A1-5DA
	3/4"	102	150	15.75	19.05	BSWCN-A1-5EA
	1"	114	201	22.1	25.4	BSWCN-A1-5FA



Type 2  
(butt weld type)

# Components (diaphragms and actuators)

## Diaphragm



Size	Part No.
8A	BSW1-8DF
15A	BSW1-15DF
25A	BSW1-25DF

## Manual type



### ■ Upper section for two-way valves

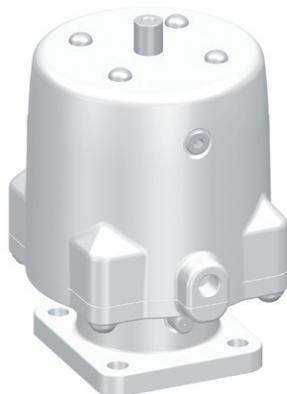
Size	Part No.
8A	BSW-A1-8AC-B
15A	BSW-A1-15AC-B
25A	BSW-A1-25AC-B

### ■ Upper section for T valves and block valves

Size	Part No.
8A	BSWT-A1-8AC-B
15A	BSWT-A1-15AC-B
25A	BSWT-A1-25AC-B

## Automatic type

(Spring-back normal close type (N.C.), normal open type (N.O.), double action (D.A))



### ■ Upper section for two-way valves

Size	Actuator Operation type	Part No.
8A	N.C.	BSWCN-A1-8AC-B
	N.O.	BSWON-A1-8AC-B
	D.A.	BSWDN-A1-8AC-B
15A	N.C.	BSWCN-A1-15AC-B
	N.O.	BSWON-A1-15AC-B
	D.A.	BSWDN-A1-15AC-B
25A	N.C.	BSWCN-A1-25AC-B
	N.O.	BSWON-A1-25AC-B
	D.A.	BSWDN-A1-25AC-B

### ■ Upper section for T valves and block valves

Size	Actuator Operation type	Part No.
8A	N.C.	BSWCTN-A1-8AC-B
	N.O.	BSWOTN-A1-8AC-B
	D.A.	BSWDTN-A1-8AC-B
15A	N.C.	BSWCTN-A1-15AC-B
	N.O.	BSWOTN-A1-15AC-B
	D.A.	BSWDTN-A1-15AC-B
25A	N.C.	BSWCTN-A1-25AC-B
	N.O.	BSWOTN-A1-25AC-B
	D.A.	BSWDTN-A1-25AC-B

# Weirless small-diameter diaphragm valves

## Compact weirless diaphragm valves

### Wheel with torque limiter mechanism

The wheel has a built-in torque limiter mechanism, and the wheel turns freely when the specified torque has been reached if the valve is fully closed, so excessive force is not exerted on the diaphragm. Thus, durability is improved because excessive application of force to the diaphragm is reduced.



Manual valves



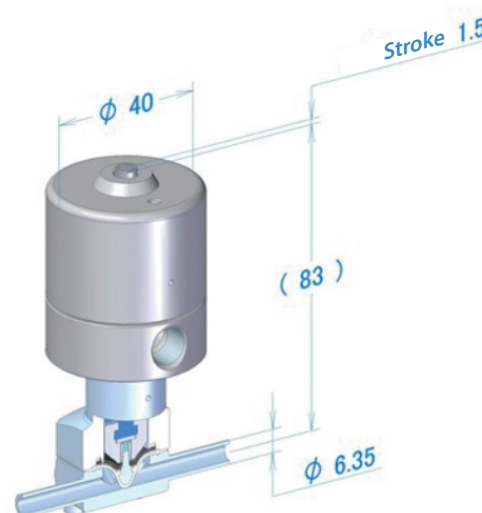
Automatic valves



Automatic valves

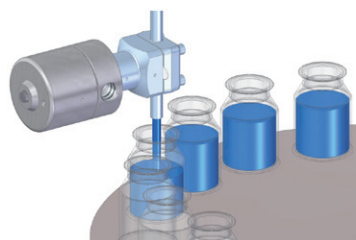
## Product specifications (two-way valve type)

Material	Body	SUS316L
	Bonnet	SUS303, aluminum
	Diaphragm	PTFE (USP Class VI, FDA 177.1550) / EPDM (USP Class VI, FDA 177.2600)
	Automatic actuator	A5056B / SUS304
Maximum working pressure		0.6 MPa when $\Delta P = 0\%$ , 1 MPa when $\Delta P = 100\%$
Working fluid temperature range		-25°C to +150°C
Body surface roughness		Seal surface: #400 buffing + electropolishing (Ra Max. 0.38 $\mu\text{m}$ ASME-BPE SF4)
Actuator	type	Spring-back type (normal close type) (N.C.)
	Operating pressure feed port Rc screw size	Rc 1/8
	Operating pressure	0.4–0.7 MPa
Body connection		ASME clamp type, butt weld type
Cv value		0.6
Stroke (mm)		1.5
Product mass (automatic valve) (kg)		~0.28

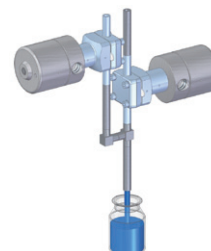


## Usage examples

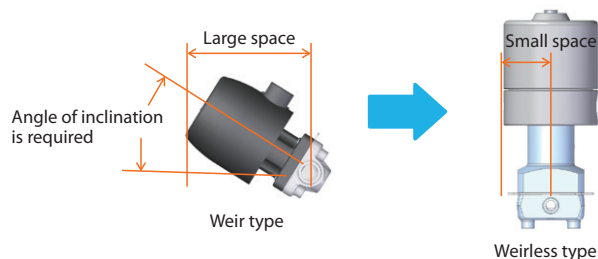
### Usage as a filling valve



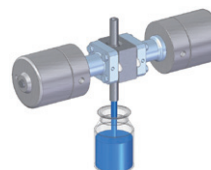
### Combination of two-way valves



### Switching from weir type to weirless type

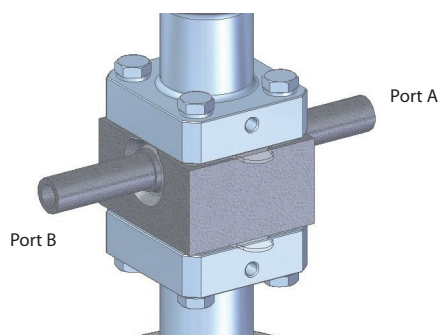


### From combination of two-way valves to three-way valve



## Flow of three-way valve with AC double installation

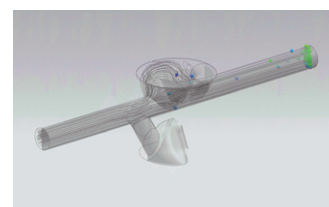
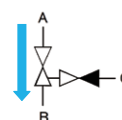
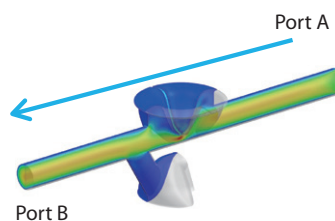
### Flow path of body interior of three-way valve



#### Example 1

A—B port: OPEN

C—B port: CLOSE



#### Example 2

A—B port: CLOSE

C—B port: OPEN

