



Air operated valve for high vacuum

# AVB<sup>5</sup><sub>6</sub><sub>7</sub><sub>8</sub>\*3 Series

- Formed bellows type
- Stainless steel body compact type



Model No.	Actuation	Orifice	Model No.	Actuation	Orifice	Model No.	Actuation	Orifice
AVB513	NC	ø24	AVB523	NO	ø24	AVB533	Double acting	ø24
AVB613	NC	ø40	AVB623	NO	ø40	AVB633	Double acting	ø40
AVB713	NC	ø50	AVB723	NO	ø50	AVB733	Double acting	ø50
AVB813	NC	ø80	AVB823	NO	ø80	AVB833	Double acting	ø80

## Compact with improved maintenance

### ● 25% lower total height

The compact body uses less space than the conventional model (AVB\*\*2).

### ● Long-life formed bellows

Special stainless steel material (ASL350)

Durability: 1 million times (\*1)

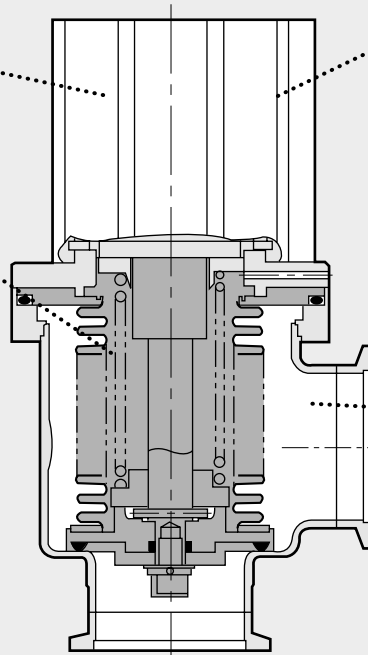
\*1 Life when working media is inert gas within specified range, which does not contain solids such as reaction products.

### ● Usable with back pressure

The vacuum pump can be connected to either port.

### ● Short installation/removal time one-fifth the conventional

The bellows can be attached and removed easily using a hexagon wrench. This greatly reduces "washing" and "replacement" processes.



### ● Miniature switch mountable

A reed switch (proximity, reed) can be connected to confirm the operation. (Retrofitting possible)

### ● No gas traps

The integrated blister creates a streamlined, smooth flow path. There is no dead space where gas may get trapped.

### ● Low dust generation

Wetted areas (flow path) have no sliding sections that may generate particles.

## ⚠ Precautions

Always read page 9 in the introduction and the precautions on page 88 to 91 to ensure correct, safe use of this product.

- Working media
- Installation
- Direction when connecting piping
- Proximity switch, reed switch

## Contact CKD for the following custom orders:

1. Different flange surface length
2. Different flange types
3. Valve heating
4. Different O-ring materials at wetted areas
5. Slow exhaust
6. Straight piping

### Specifications



Descriptions		AVB5 <sup>1</sup> <sub>2</sub> <sup>3</sup>	AVB6 <sup>1</sup> <sub>3</sub>	AVB7 <sup>1</sup> <sub>3</sub>	AVB8 <sup>1</sup> <sub>3</sub>
Working fluid		Vacuum and inert gas			
Working pressure range Pa(abs)		1.3 × 10 <sup>-6</sup> to 1 × 10 <sup>5</sup>			
Maximum working differential pressure MPa		0.1			
Valve seat leakage Pa·m <sup>3</sup> /s(He)		1.3 × 10 <sup>-9</sup> or less			
External leakage Pa·m <sup>3</sup> /s(He)		1.3 × 10 <sup>-9</sup> or less			
Withstanding pressure MPa		0.3			
Fluid temperature °C		5 to 60			
Ambient temperature °C		0 to 60			
Orifice mm		ø24	ø40	ø50	ø80
Stroke mm		10	20	22	32
Conductance Note 1 ℓ/s		13	52	80	242
Connection		NW25	NW40	NW50	NW80
Control pressure MPa		0.4 to 0.6			
Weight kg	NC	1.1	1.9	3.6	7.9
	NO	1.1	1.9	3.5	7.8
	Double acting	1.0	1.6	3.2	7.3
JIS symbol					

Note 1: The conductance is the theoretical calculation value at the molecular flow range, and is not the actual measurement value.

### Switch specifications

Descriptions	Proximity switch		Reed switch	
	T2H/T2V	T3H/T3V	TOH/TOV	T5H/T5V
Applications	Programmable controller	Relay, programmable controller	Relay, programmable controller	Programmable controller, relay, IC Circuit (without light), serial connection
Power voltage	—	10 to 28V DC	—	—
Load voltage/current	10 to 30V DC, 5 to 20mA Note 3	30V DC or less, 100mA or less	12/24V DC 50mA or less, 100V AC 7 to 20mA or less	12/24V DC 50mA or less, 100V AC 20mA or less
Power consumption	—	10 mA or less at 24 VDC (on)	—	—
Internal voltage drop	4V or less	0.5V or less	2.4V or less	0V
Light	Illuminating diode (lights when ON)			—
Leakage current	1mA or less	10 μA or less	0	0
Lead wire length Note 2	Standard 1m (oil-resistant vinyl cabtire cord 2-conductor 0.2mm <sup>2</sup> )	Standard 1m (oil-resistant vinyl cabtire cord 3-conductor 0.2mm <sup>2</sup> )	Standard 1m (oil-resistant vinyl cabtire cord 2-conductor 0.2mm <sup>2</sup> )	
Maximum impact	980m/s <sup>2</sup>		294m/s <sup>2</sup>	
Insulation resistance	20MΩ and over when measured with 500VDC megger			
Withstand voltage	No failure when 1000VAC is applied for 1 minute			
Ambient temperature range	-10 to +60°C			
Protective structure	IEC Standard IP67, JIS CO920 (water-tight type), oil-resistant			

Note 2: 3 m and 5 m leads are available as options.

Note 3: The maximum load current 20 mA above is at 25°C.

If the switch's working ambient temperature is higher than 25°C, load current will be lower than 20 mA (5 to 10 mA at 60°C).

Note 4: See page 89 to 91 for other precautions for using the switches.

## How to order



Model No.

**A** Series

**B** Actuation

**C** Connection

**D** Switch model No.

**E** Switch lead wire length

**F** Switch quantity  
(Detecting position)

### <Example of model number >

#### AVB613-40K-T5H3-H

Model: AVB613 high vacuum air operated valve

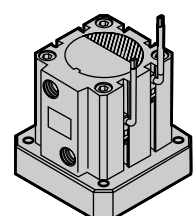
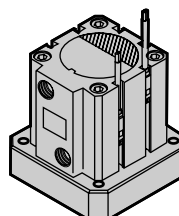
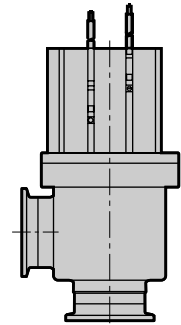
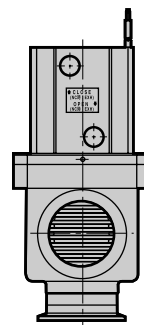
- A**Series : Orifice  $\phi 40$
- B**Actuation : NC (normally closed)
- C**Connection : NW40
- D**Switch model No. : T5H  
(Axial lead wire)
- E**Lead wire length : 3m
- F**Switch quantity : Detect when valve is open

Symbol	Descriptions		
<b>A Series</b>			
5	Orifice $\phi 24$		
6	Orifice $\phi 40$		
7	Orifice $\phi 50$		
8	Orifice $\phi 80$		
<b>B Actuation</b>			
1	NC (normally closed)		
2	NO (normally open)		
3	Double acting		
<b>C Connection</b>			
25K	NW25	Only AVB5*3 is available	
40K	NW40	Only AVB6*3 is available	
50K	NW50	Only AVB7*3 is available	
80K	NW80	Only AVB8*3 is available	
<b>D Switch model No.</b>			
Blank	Without switch		
TOH	Axial lead wire	Reed	2 wire
T5H			
TOV	Radial lead wire	Proximity	
T5V			
T2H	Axial lead wire	Proximity	3 wire
T3H			
T2V	Radial lead wire	Proximity	2 wire
T3V			
<b>E Switch lead wire length</b>			
Blank	1m(standard)		
3	3m		
5	5m		
<b>F Switch quantity</b>			
Blank	Without switch		
H	Detect when valve is open		
R	Detect when valve is closed		
D	Detect when valve is open/closed		

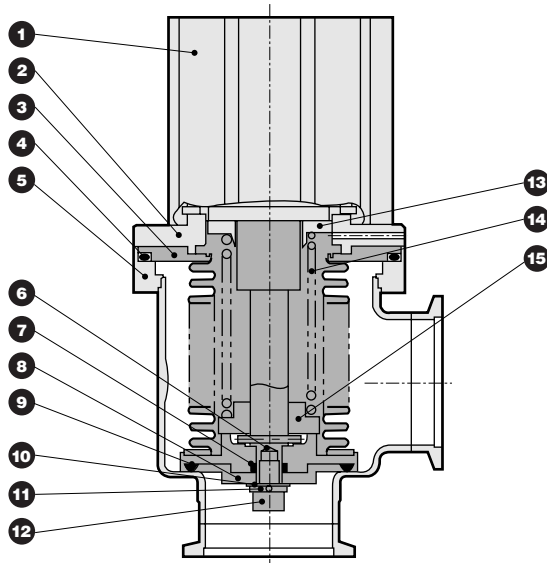
### Appearance when switch is mounted

● T\*H type  
(Axial lead wire)

● T\*V type  
(Radial lead wire)



### Internal structure and parts list



(NC cross-section)

No.	Parts name	Material
1	Compact cylinder	
2	Cylinder adapter	A5056
3	Bellows assembly	ASL350/SUS316L
4	O ring	FKM
5	Body assembly	SUS316L
6	Parallel pin	SUS301
7	O ring	FKM
8	Valve disk B	SUS316L
9	O ring	FKM
10	Plain washer	SUS304
11	Spring washer	SUS304
12	Hexagon socket head bolt	SUS304
13	Spring holder B	C3604
14	Spring	SWOSC-V (Electrodeposition coating)
15	Spring holder A	C3604

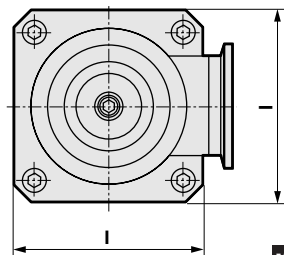
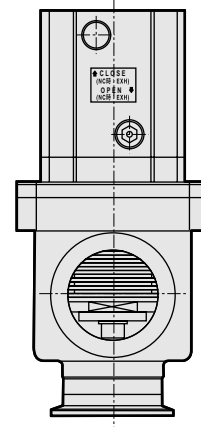
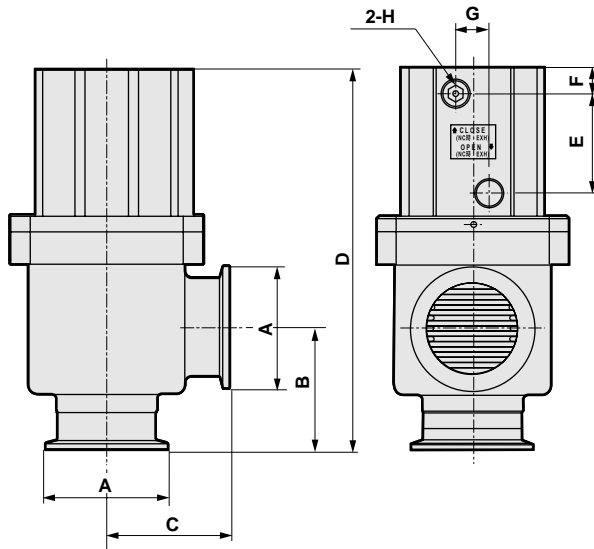
### Dimensions

Switch model No.

AVB\*\*3-\*K- ( \* \* \* )

● NC type/Double acting

● NO



Dimensions in parentheses under symbol D are for NO.

Model No. / Symbol	A	B	C	D	E	F	G	H	I
AVB5*3	ø40(NW25)	50	50	151.5(162.5)	37	8	10	Rc1/8	77
AVB6*3	ø55(NW40)	55	55	170.5(181.5)	44.5	10.5	15	Rc1/4	86
AVB7*3	ø75(NW50)	70	70	208	52	11	15	Rc1/4	112
AVB8*3	ø114(NW80)	90	105	258	64.5	13	15	Rc3/8	137