Micro-Flow Control Valves

Model VSM_ _ _

OVERVIEW

The VSM control valve is used for highly accurate control of micro flow rates in pilot plants, etc. The compact and robust valve body is made of die-forged material and is not readily affected by stress from the process pipe. In addition, because it is a top-entry valve, it can be disassembled and reassembled for parts replacement while the valve is installed on the pipe without using special tools.

SPECIFICATIONS

Body

Type

Straight-through, forging micro-flow valve

End connections

Threaded end : Rc1/4, Rc1/2, 1/4NPT, 1/2NPT
Flanged end : 1/2, 3/4, 1 inch

Rating

Connection type	Pressure rating	Applicable standard
RF	JIS 10k, 20k, 30k, 40k, 63k	JIS B2210-1984
	ANSI Class 150, 300, 600, 900, 1500, 2500	ANSI B16.5-1981
	JPI Class 150, 300, 600, 900, 1500, 2500	JPI-7S-15-1993
RJ	ANSI Class 150, 300, 600, 900, 1500, 2500	ANSI B16.5-1981
	JPI Class 150, 300, 600, 900, 1500, 2500	JPI-7S-15-1993

Material

Stainless steel (SUS F304 or SUS F316) or other alloy steel

Bonnet

Plain bonnet (-30 to +400 °C)

Gland type

Screwed gland

Packing

V shaped PTFE packing or graphite packing

Note) PTFE : Polytetrafluoroethylene

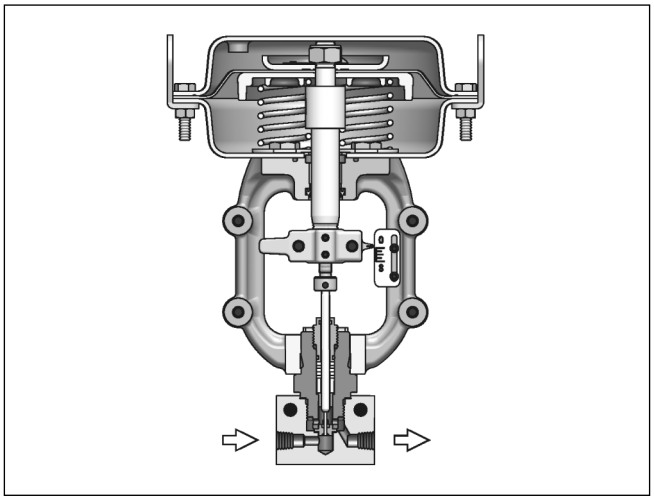
Gasket

ANSI Class 600 or under, JIS 40K or under, JPI Class 600 or under

Temperature range	Flat type gasket
-30 to +200 °C	SUS316+PTFE
+200 to +400 °C	Tantalum

ANSI Class 900–2500, JIS 63K, JPI Class 900–2500

Temperature range	Flat type gasket	Spiral wound gasket
-30 to +200 °C	SUS316+ PTFE	Hoop : SUS316 Filler : PTFE
+200 to +400 °C	Tantalum	Hoop : SUS316 Filler : graphoil



Class 600 or under

Trim

Valve plug

Cage type, single-seated contoured plug

Flow characteristics

Equal percentage (%C), Linear contoured (LC)

Material

Stainless steel (SUS 316), MS No. 6B (UNS NO. R30016), or other alloy steel

Actuator

Type

Multispring type diaphragm motor (model PSK1)

Action

Direct or reverse action

Diaphragm

Ethylene propylene rubber reinforced with fabric

Spring range

40 to 120 kPa {0.4 to 1.2 kgf/cm^2},
80 to 160 kPa {0.8 to 1.63 kgf/cm^2},
120 to 210 kPa {1.2 to 2.14 kgf/cm^2}

Air supply pressure:

180 kPa {1.8 kgf/cm^2}, 270 kPa {2.8 kgf/cm^2}, 340 kPa {3.5 kgf/cm^2}

Air connection

Rc1/4 internal thread

Ambient temperature

-30 °C to +70 °C

Valve action

Air-to-close (Direct-action actuator is combined.)
Air-to-open (Reverse-action actuator is combined.)

Optional accessories

Input/Output Signal	Model
I/P	AVP2_ _ AVP3_ _ AVP7_ _
P/P	VPE-_ _

Pressure regulator with filter
Limit switch
Solenoid valve, and etc.

Performance

Rated Cv and rangeability

Rated Cv value	Rangeability	Rated Cv error tolerance
0.63 to 0.16	30:1	−20 to + 20 %
0.10 to 0.02	25:1	−20 to + 20 %
0.01 to 0.001	20:1	−20 to + 20 %

Allowable differential pressure

Refer to Table 2.

Leakage specification

IEC 60534-4:2006 or JIS B 2005-4:2008
Standard..... Class IV : Leakage less than 0.01% of maximum valve capacity
Option..... Leakage less than 0.001% of maximum valve capacity

Hysteresis error (with positioner)

1% F.S. or less

Linearity (with positioner)

± 3% F.S. or less

Dimensions

Refer to Table 3, 4 and Figure 1.

Weight

Refer to Table 5.

Finish

Blue, Silver, or other specified colors

Table 1. Flow coefficient Cv and stem travel

Plug and characteristic \ Rated Cv value	0.001	0.002	0.005	0.01	0.02	0.05	0.10	0.16	0.25	0.40	0.63
Equal percentage contoured (%C)	—	—	—	—	—	—	—	—	✓	✓	✓
Linear contoured (LC)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Rated travel (mm)	10										

Table 2. Allowable differential pressure

Table 2-1 Air-to-close

Actuator model	Supply pressure kPa {kgf/cm²}	Spring range kPa {kgf/cm²}	Allowable differential pressure when fully open MPa {kgf/cm²}
PSK1D	180 {1.8}	40 to 120 {0.4 to 1.2}	9.8 {100}
	270 {2.8}	80 to 160 Class 600 or under	9.8 {100}
		40 to 120 Class 900 or above	29.4 {300}
	340 {3.5}	40 to 120 Class 900 or above	40.5 {413}

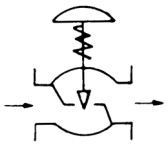
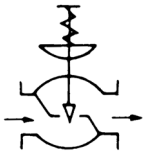


Table 2-2 Air-to-open

Actuator model	Supply pressure kPa {kgf/cm²}	Spring range kPa {kgf/cm²}	Allowable differential pressure when fully open MPa {kgf/cm²}
PSK1R	180 {1.8}	40 to 120 {0.4 to 1.2}	6.0 {61.2}
	270 {2.8}	80 to 160 Class 600 or under	9.8 {100}
		80 to 160 Class 900 or above	29.4 {300}
	340 {3.5}	120 to 210 Class 900 or above	40.5 {413}



Note) All valves which employ graphite packing are incorporated with a positioner as a standard provision.

Table 3. Face-to-face dimensions (thread type) [unit: mm]

Connection	A
Rc1/4, 1/4NPT	70
Rc1/2, 1/2NPT	100

Table 4. Table 4. Face-to-face dimensions (flange type) [unit: mm]

Connection (inches)	B				
	JIS 10K RF ANSI 150 RF	JIS 20K RF JIS 30K RF ANSI 300 RF	JIS 40K RF ANSI 600 RF	JIS 63K RF	ANSI 900 RF ANSI 1500 RF ANSI 2500 RF
1/2	184	194	206	275	290
3/4	184	194	206	275	290
1	184	197	210	275	290
Connection (inches)	ANSI 150 RJ	ANSI 300 RJ	ANSI 600 RJ	JIS 63K RJ	ANSI 900 RJ ANSI 1500 RJ ANSI 2500 RJ
1/2	—	206	206	290	290
3/4	—	206	206	290	290
1	179	210	210	290	290

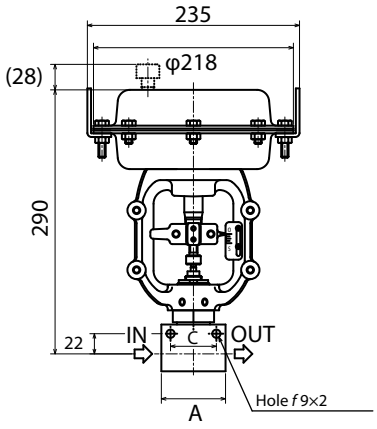


Figure 1-1 Dimensions for threaded model (Class 600 or under)

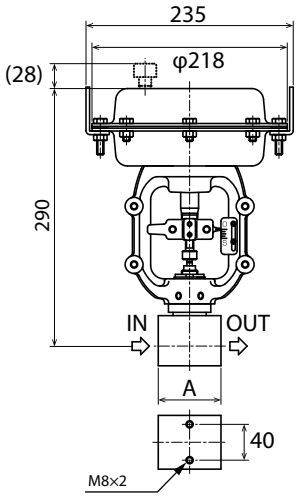


Figure 1-2 Dimensions for threaded model (Class 900 or above)

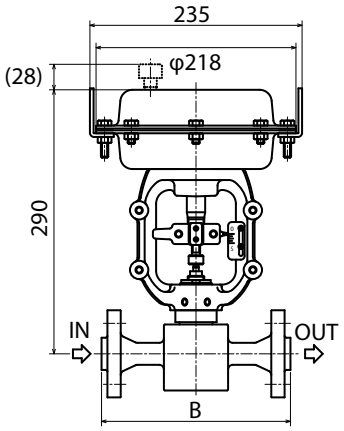


Figure 1-3 Dimensions for flanged model

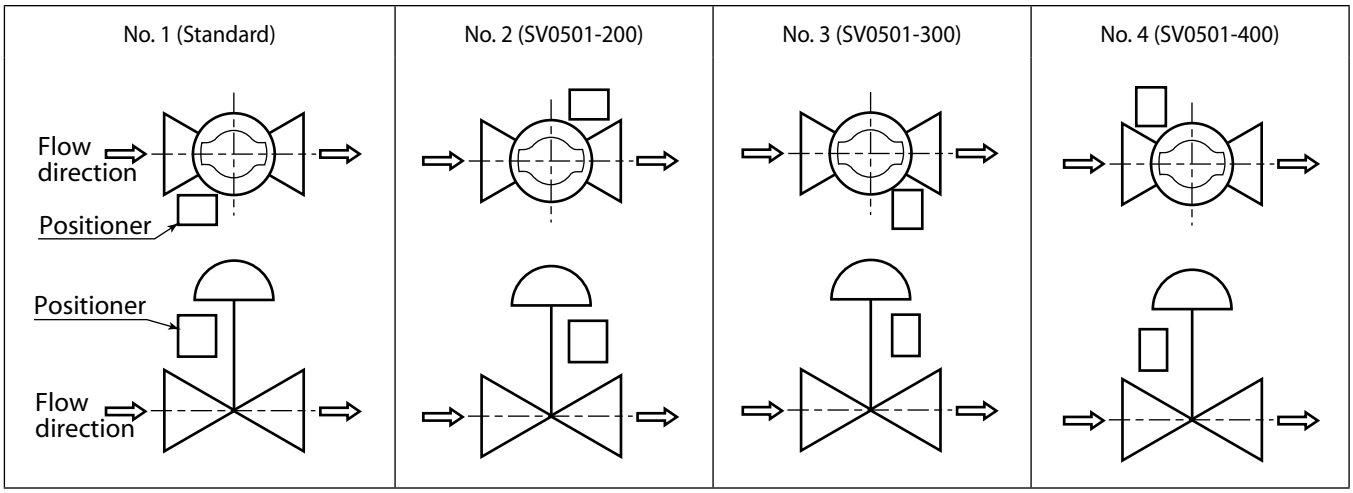
Table 5-1 Weight (Thread type) [Unit: kg]

Connection (inches)	ANSI 600 or under JPI 600 or under	ANSI 900-2500 JPI 900-2500
Rc1/4, 1/4NPT	9	9
Rc1/2, 1/2NPT	9	10

Table 5-2 Weight (Flange type) [Unit: kg]

Connection (inches)	JIS 10K ANSI 150 JPI 150	JIS 20K, 30K ANSI 300 JPI 300	JIS 40K ANSI 600	JIS 63K ANSI 900, 1500 JPI 900, 1500	ANSI 2500 JPI 2500
1/2	11	12	13	17	20
3/4	12	13	14	18	21
1	13	14	15	20	23

Thread type



Flange type

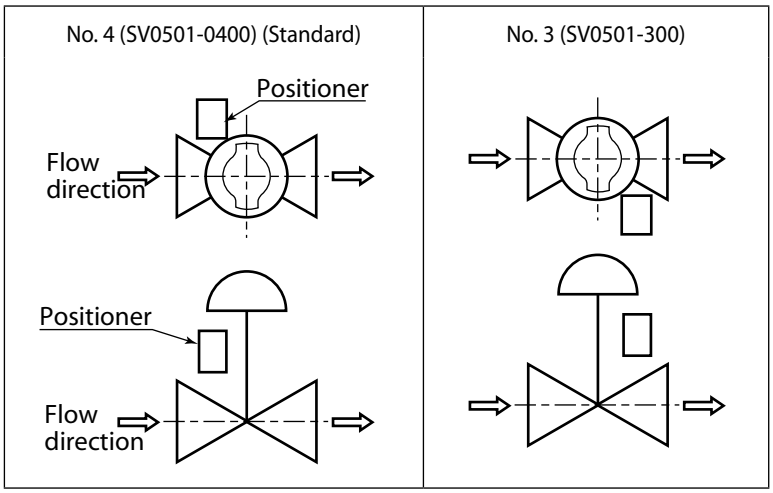


Figure 2. Actuator orientation

Note) Indicate by position number when installation other than the standard type is required.

Ordering Information

When ordering, please specify;

1) Model Number: VSM_ _ _
2) End connection and rated Cv
3) Body rating and type of end connection
4) Body and trim material, necessity of hardening
5) Valve characteristics and type of plug
6) Type of actuator and supply air pressure
7) Valve action (direct or reverse)
8) Necessity of positioner, pressure regulator with filter
9) Necessity of special spec. such as oil-free, copper free and etc.
10) Name of flow medium
11) Normal flow and maximum flow required
12) Pressure of flow medium, upstream and downstream pressure (at fully closed and fully opened)
13) Temperature and specific gravity of flow medium
14) Viscosity of flow medium, inclusive or exclusive of slurry

Please read “Terms and Conditions” from the following URL before ordering and use.

https://www.azbil.com/products/factory/order.html

azbil

Specifications are subject to change without notice.

Azbil Corporation

Advanced Automation Company

1-12-2 Kawana, Fujisawa
Kanagawa 251-8522 Japan
URL: https://www.azbil.com/

1st edition: June 2022