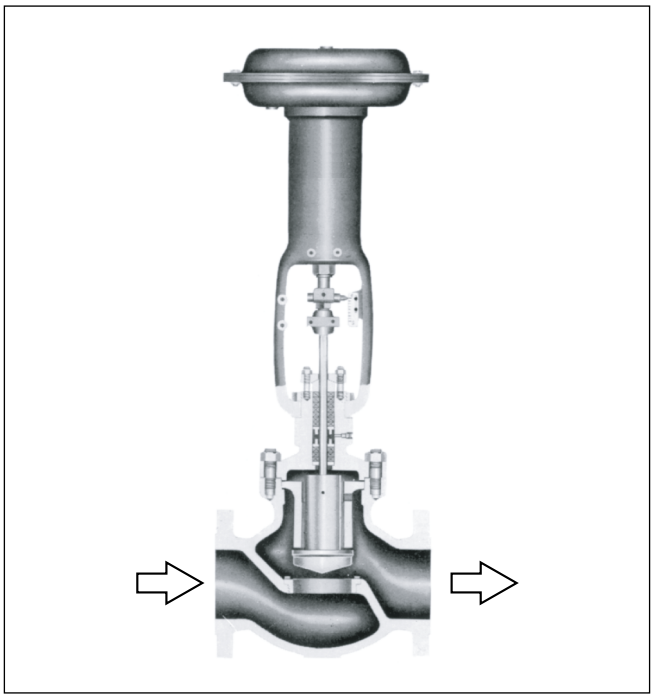
Top-Guided Single Seated Control Valves (Rating : ANSI 600 or Less)

Model VST

OVERVIEW

Model VST control valves are suitable for use in fluid with slurry because of its one side guiding construction. Guide portion is solid and has sufficient sliding area against abrasion.
The body construction allows simpler disassembly, faster checking of trim, and easier parts replacement.
Also, valve plug and seat ring can be fitted without mounting the bonnet.



SPECIFICATIONS

Body

Type

Single seated, straight-through cast globe valve

Material

SCPH2, SCPH21, SCPH32, SCPH61, SCS13, SCS14, and other steel alloys

Nominal size

5, 10, 12 inches

End connection

Flanged end

Connection	Pressure rating	Standards compliance
FF	JIS10K	JIS B2212-1972
	ANSI Class 125	ANSI B16.5-1968
	JPI Class 125	JPI-7S-15-1993
RF	JIS10K	JIS B2212-1972
	JIS16K	JIS B2213-1967
	JIS20K	JIS B2214-1967
	JIS30K	JIS B2215-1967
	JIS40K	JIS B2216-1967
	ANSI Class 150, 300, 600	ANSI B16.5-1968
	JPI Class 150, 300, 600	JPI-7S-15-1993
RJ	ANSI Class 150, 300, 600	ANSI B16.5-1968
	JPI Class 150, 300, 600	JPI-7S-15-1993

Pressure rating

- JIS 10K, 16K, 20K, 30K, 40K
- ANSI Class 150, 300, 600

Gland type

Bolted gland

Bonnet

Plain bonnet:	0 to 200°C
Radiation finned bonnet:	over 200°C
Extended bonnet:	0°C or less
Bellows seal bonnet:	-30 to +300°C, 981 kPa {10.0 kgf/cm^2} max.

Packing / Grease

- Grease not provided
  V shaped PTFE packing, PTFE yarn packing
- Grease provided
  Graphite packing

Note) PTFE: Polytetrafluoroethylene

Drain plug

None (optionally available)

Trim

Valve plug: Single seated

Equal percentage contoured and Soft seat
Linear contoured and Soft seat
On-off plug with CoCr-A hardfaced seat
(For the PTFE seat plug for on-off service, a linear-contour soft seat plug is used.)
(For the operating temperature and pressure differential range of the Soft seat plug, refer to Figure 1.)

Material

SUS316, SUS316 with CoCr-A hardfacing (seat or entire surface), SUS440C, other steel alloys

Actuator

Type

Actuator type	Action direction	Actuator model
Spring type diaphragm actuator	Direct or reverse	VA5_
Spring type piston cylinder actuator	Reverse	PSA6R PSA7R

Diaphragm material

Actuator model	Material
VA5_	Chloroprene rubber with embedded cloth

Spring range and supply air pressure

Actuator model	Spring range	Supply air pressure
VA5_	20 to 98 kPa {0.2 to 1.0 kgf/cm²}	120 kPa {1.2 kgf/cm²} 140 kPa {1.4 kgf/cm²} 250kPa {2.6 kgf/cm²}
	40 to 120 kPa {0.4 to 1.2 kgf/cm²}	140 kPa {1.4 kgf/cm²}
	40 to 200 kPa {0.4 to 2.0 kgf/cm²}	250 kPa {2.6 kgf/cm²}
	80 to 240 kPa {0.8 to 2.4 kgf/cm²}	270 kPa {2.8 kgf/cm²}
PSA6R	200 to 340 kPa {2.0 to 3.5 kgf/cm²} 200 to 390 kPa {2.0 to 4.0 kgf/cm²}	400 kPa {4.0 kgf/cm²} 500 kPa {5.0 kgf/cm²}
PSA7R	200 to 270 kPa {2.0 to 2.8 kgf/cm²} 200 to 340 kPa {2.0 to 3.5 kgf/cm²}	400 kPa {4.0 kgf/cm²}

Air pipe connection

Actuator model	Air pipe connection
PSA6R PSA7R	• Rc1/4 or 1/4NPT • Rc3/8 or 3/8NPT • Rc1/2 or 1/2NPT
VA5_	• Rc1/4 or 1/4NPT • Rc3/8 or 3/8NPT • Rc1/2

Ambient temperature

-30 to +70°C

Valve action

Air-to-close or air-to-open available by using direct or reverse actuator. Non-reversible body.

Optional accessories

Hand wheel (side or top mounted), Positioner, Limit switch, Motion transmitter, Volume booster, Air lock relay and other available.

Additional specification

Steam jacket (operating pressure 981 kPa {10.0 kgf/cm²} or less) may be provided as required.

Performance

Leakage specification

Contoured type

IEC 60534-4:2006 or JIS B 2005-4:2008

Metal seat

Class IV : Leakage less than 0.01% of maximum valve capacity
(Optional: leakage less than 0.001% or less)

Soft seat

Class VI : Leakage less than 0.00001% of maximum valve capacity

Quick opening type

Metal seat (with CoCr-A hardfacing)
Leakage less than 0.00001% of maximum valve capacity

Action (For standard type gland)

Hysteresis error

Actuator model	VA5_, PSA7R	PSA6R
Without positioner	3 % FS max.	9 % FS max.
With positioner	1 % FS max.	2 % FS max.

Linearity

Actuator model	VA5_, PSA7R	PSA6R
Without positioner	±5 % FS max.	±9 % FS max.
With positioner	±1 % FS max.	±2 % FS max.

Rangeability

30:1 (optional 50:1)

Dimensions

Refer to Table 8 and Table 9

Weight

Refer to Table 10

Finish

Blue or silver, or other specified colors

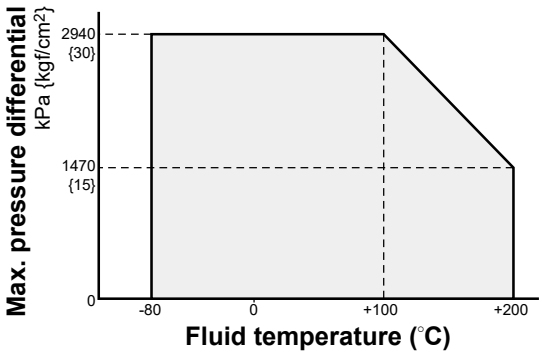


Figure 1. Operating temperature and Pressure differential limit of PTFE seat valve

Table 1. Cv value and rated travel

Valve size (inches)			5			10			12		
Port size (inches)			3	4	5	6	8	10	8	10	12
Rated Cv value			99	175	275	395	640	1000	640	1000	1440
Plug type & Characteristic	Equal percentage contoured		✓	✓	✓	✓	✓	✓	✓	✓	✓
	Linear contoured	Rated travel (mm)	50			100			100		
	Equal percentage contoured, Soft seat		✓	✓	✓	✓	✓	✓	✓	✓	✓
	Linear contoured, Soft seat	Rated travel (mm)	50			100			100		
	On-off plug with CoCr-A hardfaced seat		——	——	✓	——	——	✓	——	——	✓
		Rated travel (mm)	37.5			75			75		

Note) ✓*: Applicable*

Equal percentage

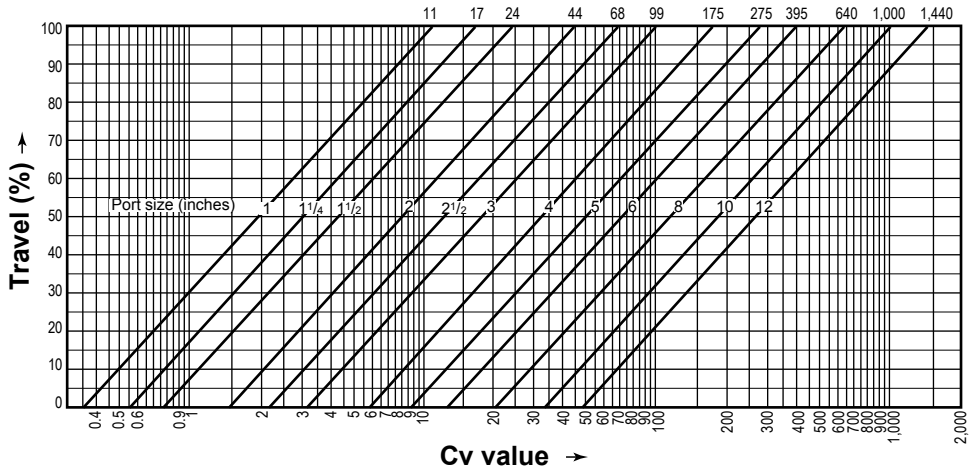


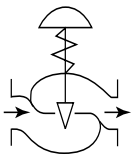
Figure 2. Flow characteristics

(Idealistic flow characteristics is indicated in this graph.)

Allowable differential pressure

Metal seat (%C, LC) : PTFE packing

Table 2. Air-to-close

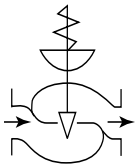


Actuator model	Supply pressure kPa {kgf/cm²}	Spring range kPa {kgf/cm²}	Positioner	Differential pressure kPa {kgf/cm²}						
				Port size (inches)						
				3	4	5	6	8	10	12
VA5D	120 {1.2}	20 to 98 {0.2 to 1.0}	×	380 {3.9}	210 {2.1}	130 {1.3}	90 {0.9}	52 {0.53}	33 {0.32}	22 {0.23}
	140 {1.4}	20 to 98 {0.2 to 1.0}	✓	950 {9.7}	530 {5.4}	330 {3.4}	240 {2.4}	130 {1.3}	85 {0.87}	59 {0.60}
	250 {2.5}	20 to 98 {0.2 to 1.0}	✓	3920 {40.0}	2560 {26.1}	1670 {17.0}	1180 {12.0}	670 {6.8}	420 {4.3}	290 {3.0}

Note) 1. The figure inside bold line are for standard actuator.

2. Positioner; ×... without, ✓...with

Table 3. Air-to-open



Actuator model	Supply pressure kPa {kgf/cm²}	Spring range kPa {kgf/cm²}	Positioner	Differential pressure kPa {kgf/cm²}						
				Port size (inches)						
				3	4	5	6	8	10	12
VA5R	140 {1.4}	20 to 98 {0.2 to 1.0}	× or ✓	——	——	130 {1.3}	90 {0.9}	52 {0.53}	33 {0.34}	22 {0.22}
		40 to 120* {0.4 to 1.2}	△	——	——	400 {4.1}	270 {2.8}	160 {1.6}	98 {1.0}	70 {0.71}
	270 {2.5}	80 to 240 {0.2 to 2.4}	✓	——	——	930 {9.5}	650 {6.6}	360 {3.7}	220 {2.2}	160 {1.6}
PSA6R	400 {4.1}	200 to 340 {2.0 to 3.5}	✓	3920 {40.0}	2940 {30.0}	——	——	830 {8.5}	——	——
	500 {5.1}	200 to 390 {2.0 to 4.0}	✓	3920 {40.0}	2940 {30.0}	1860 {19.0}	1240 {12.6}	830 {8.5}	540 {5.5}	370 {3.8}
PSA7R	400 {4.1}	200 to 270 {2.0 to 2.8}	✓	3920 {40.0}	3920 {40.0}	3840 {39.2}	——	——	——	——
	400 {4.1}	200 to 340 {2.0 to 3.5}	✓	——	——	——	2670 {27.2}	1500 {15.3}	960 {9.8}	660 {6.7}

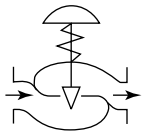
*Note) 1. * The allowable differential pressure for 40 to 200 kPa {0.4 to 2.0 kgf/cm²} spring range are the same as for 40 to 120 kPa {0.4 to 1.2 kgf/cm²} spring.*

2. The figures inside bold line are for standard actuator.

3. Positioner; ×... without, △... Preferably with, ✓...with

Soft seat (%T, LT)

Table 4. Air-to-close

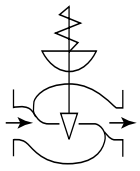


Actuator model	Supply pressure kPa {kgf/cm²}	Spring range kPa {kgf/cm²}	Positioner	Differential pressure kPa {kgf/cm²}					
				Port size (inches)					
				4	5	6	8	10	12
VA5D	120 {1.2}	20 to 98 {0.2 to 1.0}	×	250 {2.5}	120 {1.2}	70 {0.7}	——	——	——
	140 {1.4}	20 to 98 {0.2 to 1.0}	✓	610 {6.2}	370 {3.8}	240 {2.4}	120 {1.2}	**60 {0.6}**	**30 {0.3}**
	250 {2.5}	20 to 98 {0.2 to 1.0}	✓	2560 {26.1}	1860 {19.0}	1370 {14.0}	720 {7.3}	**450 {4.6}**	**300 {3.0}**

Note) 1. The figure inside bold line are for standard actuator.

2. Positioner; ×... without, ✓...with

Table 5. Air-to-open



Actuator model	Supply pressure kPa {kgf/cm²}	Spring range kPa {kgf/cm²}	Positioner	Differential pressure kPa {kgf/cm²}					
				Port size (inches)					
				4	5	6	8	10	12
VA5R	140 {1.4}	20 to 98 {0.2 to 1.0}	× or ✓	——	90 {0.9}	50 {0.5}	——	——	——
		40 to 120* {0.4 to 1.2}	△	——	340 {3.5}	220 {2.2}	110 {1.1}	**50 {0.5}**	**30 {0.3}**
	270 {2.5}	80 to 240 {0.8 to 2.4}	✓	——	840 {8.6}	570 {5.8}	300 {3.1}	**190 {1.9}**	**120 {1.2}**
PSA6R	400 {4.1}	200 to 340 {2.0 to 3.5}	✓	——	——	——	580 {5.9}	——	——
	500 {5.1}	200 to 390 {2.0 to 4.0}	✓	2530 {25.8}	1780 {18.2}	981 {10.0}	——	380 {3.9}	260 {2.7}

*Note) 1. * The allowable differential pressure for 40 to 200 kPa {0.4 to 2.0 kgf/cm²} spring range are the same as for 40 to 120 kPa {0.4 to 1.2 kgf/cm²} spring.*

2. The figures inside bold line are for standard actuator.

3. Positioner; ×... without, △... Preferably with, ✓...with

On-off plug with CoCr-A hardfaced seat (QS)

Table 6. Air-to-close

Actuator model	Supply pressure kPa {kgf/cm²}	Spring range kPa {kgf/cm²}	Initial spring compression kPa {kgf/cm²}	Differential pressure kPa {kgf/cm²}				
				Port size (inches)				
				5	6	8	10	12
VA5D	140 {1.4}	20 to 98 {0.2 to 1.0}	20	680 {6.9}	480 {4.9}	200 {2.0}	**1670 {17.0}**	**120 {1.2}**
	250 {2.5}	20 to 98 {0.2 to 1.0}	20	1570 {16.0}	1080 {11.0}	580 {5.9}	**380 {3.9}**	**270 {2.8}**

Table 7. Air-to-open

Actuator model	Supply pressure kPa {kgf/cm²}	Spring range kPa {kgf/cm²}	Initial spring compression kPa {kgf/cm²}	Differential pressure kPa {kgf/cm²}				
				Port size (inches)				
				5	6	8	10	12
VA5R	140 {1.4}	20 to 98 {0.2 to 1.0}	40	290 {3.0}	220 {2.2}	120 {1.2}	**80 {0.8}**	**60 {0.6}**
	250 {2.5}	40 to 200 {0.4 to 2.0}	80	600 {6.1}	430 {4.4}	240 {2.4}	**170 {1.7}**	**120 {1.2}**
PSA6R	500 {5.1}	200 to 340 {2.0 to 3.5}	——	1370 {14.0}	981 {10.0}	——	——	——

DIMENSIONS

Table 8. Face to face dimensions

[Unit: mm]

Valve size (inches)	A					
	JIS 10K FF, RF ANSI 150 RF	JIS 16K, 20K, 30K RF ANSI 300 RF	JIS 40K RF ANSI 600 RF	ANSI 150 RJ	ANSI 300 RJ	ANSI 600RJ
5	403	425	457	416	441	460
10	673	708	752	686	724	756
12	737	775	819	749	791	822

Table 9. External dimensions

[Unit: mm]

Valve size (inches)	Actuator model	B				ϕ C
		Direct action (air-to-close)		Reverse action (air-to-open)		
		Normal temp. bonnet	High temp. bonnet	Normal temp. bonnet	High temp. bonnet	
5	VA5D, VA5R	1330	1480	1440	1590	620
	PSA6R	——	——	1280	1430	476
10	VA5D, VA5R	1760	2015	1890	2145	620
	PSA6R	——	——	1820	2075	476
12	VA5D, VA5R	1810	2020	1940	2150	620
	PSA6R	——	——	1870	2080	476

Note) For the PSA6R actuator with a handwheel, add 200 mm to dimension B above.

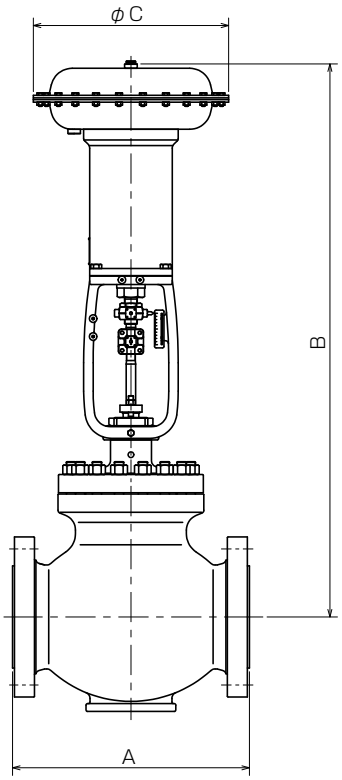


Figure 3. Model VA5

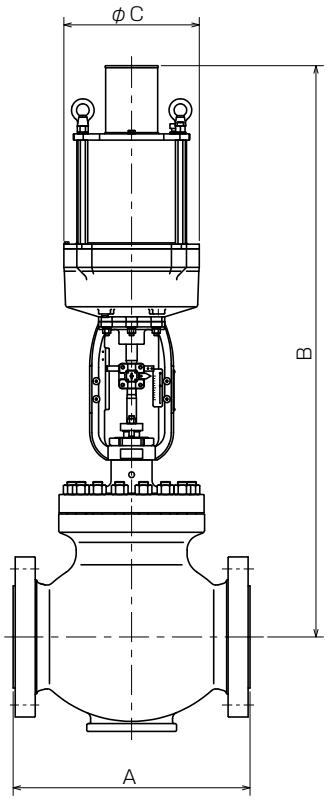


Figure 4. Model PSA6R

Table 10. Weight

[Unit: kg]

Valve size (inches)	Actuator model	Weight					
		JIS 10K, ANSI 150		JIS 16K, 20K, 30K, ANSI 300		JIS 40K, ANSI 600	
		Normal temp. bonnet	High temp. bonnet	Normal temp. bonnet	High temp. bonnet	Normal temp. bonnet	High temp. bonnet
5	VA5D	260	268	270	278	315	323
	VA5R	285	293	295	303	340	348
	PSA6R	265	273	275	283	320	328
10	VA5D	560	600	690	710	750	780
	VA5R	585	625	715	735	775	805
12	VA5D	750	780	900	920	1000	1100
	VA5R	775	805	925	945	1025	1125

Note) Please contact us for the weight of control valves with bellows seals.

Ordering Information

When ordering, please specify;

1) Model Number: ACP
2) Nominal size X Port size
3) Type and rating of end connections
4) Body and trim material, necessity of hardening
5) Type of bonnet
6) Valve and plug characteristics
7) Type of actuator, air to diaphragm
8) Valve action (direct or reverse)
9) Accessories (positioner, hand wheel, pressure regulator etc.)
10) Special requirement of degreasing, free from copper and etc.
11) Name of flow medium
12) Normal flow and maximum required flow
13) Pressure of flow medium upstream and downstream pressure at maximum and minimum, required flow
14) Temperature and specific gravity of flow medium
15) Viscosity of flow medium, inclusive or exclusive of slurry

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