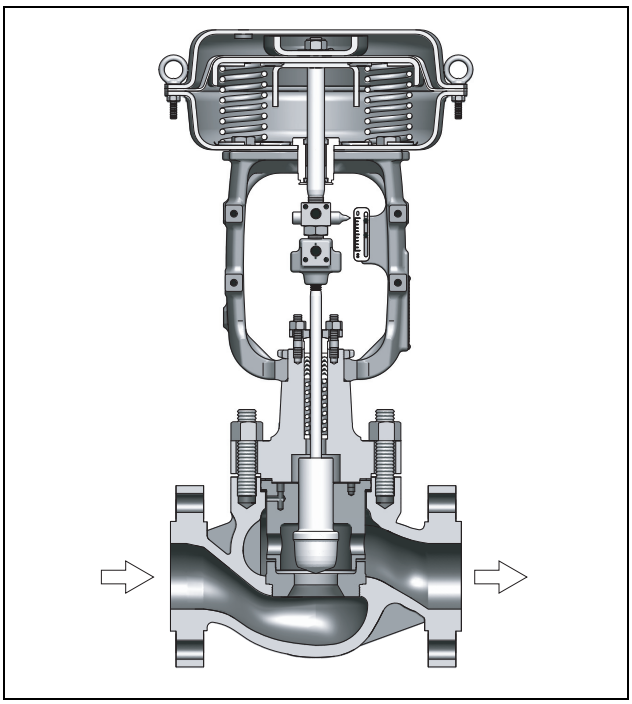
CV3000 Series
Cage type Single Seated Control Valves
Model HSC

OVERVIEW

Model HSC Cage Type Single Seated Control Valves are designed for high differential pressure heavy-duty service where flashing/cavitation may occur. Further, they are ideal for preventing erosion from the valve body, because their guides are sturdy and the valve body is protected by a cage. The compact valve body, having an S-shaped flow passage that features low pressure loss, allows a large flow capacity and rangeability.

The valve plug is highly vibration-resistant as it is held by a top guide section which has a large sliding area. The flow shutoff performance complies with the IEC or JIS Standards. The actuator, integrated with simplest mechanisms, utilizes a compact yet powerful diaphragm actuator loaded with multiple springs.

The model HSC Control Valves are widely applicable for reliable control of flows in high- or low-temperature, high differential pressure process lines.



SPECIFICATIONS

Body

Type
Straight through, cast globe valve

Nominal size
1½, 2, 2½, 3, 4, 6, 8 inches

Pressure rating
- JIS 10K, 16K, 20K, 30K, 40K
- ANSI Class 125, 150, 300, 600
- JPI Class 125, 150, 300, 600

End connection
- Flanged end:

Connection type	Pressure rating	Applicable standard
FF	JIS10K	JIS B2210-1984
	ANSI Class 125	ANSI B16.5-1981
	JPI Class 125	JPI-7S-15-1993
RF	JIS10K, 16K, 20K, 30K, 40K	JIS B2210-1984
	ANSI Class 150, 300, 600	ANSI B16.5-1981
	JPI Class150, 300, 600	JPI-7S-15-1993
RJ, LG	ANSI Class 150, 300, 600	ANSI B16.5-1981
	JPI Class 150, 300, 600	JPI-7S-15-1993
Tongue and groove(groove) Male and female(female)	JIS16K, 20K, 30K, 40K	JIS B2202-1984

- Welded end: SW (1/2 to 2 inches)
  BW (2½ to 8 inches)

Material
For body / trim material combinations and operating temperature ranges, refer to Table 1.

Bonnet
- Plain bonnet (-17 to 230 °C)
- Extension bonnet Type 1
  (-45 to -17 °C and 230 to 566 °C)
- Extension bonnet Type 2
  Integral-cast type (-100 to -45 °C)
  Welded type (-196 to -100 °C)

Note) Take care not to exceed the operating temperature ranges specified for respective materials.

Gland type
Bolted gland

Packing/Grease
- Grease not provided; When V shaped PTFE packing or PTFE yarn packing is used.
- Grease provided; When graphite packing is used.

Note) PTFE: Polytetraflouroethylene

Gasket
Type; Flat type, serrated type
Material; Stainless steel (SUS316, SUS316L, SUS329J1), copper, aluminum

Trim

Valve plug
Single-seated, Contoured-type plug (Regarding flow characteristics, refer to Figure 1.)
• Metal seat: Equal percentage (%CC), Linear (LCC)

Cage
Separate type

Material
For body / trim material combinations and operating temperature ranges, refer to Table 1.

Actuator

Type
Single acting diaphragm actuator (Type PSA1, HA or VA5)
Spring type piston actuator (Type PSA6)
Double acting piston actuator (Type VP)

Action
Direct or reverse action

Diaphragm
Type PSA1, HA: Cloth embedded ethylene propylene rubber
Type VA: Cloth-chloroprene rubber

Spring range
Type PSA1, HA or VA5 :
20 to 98 kPa {0.2 to 1.0 kgf/cm²} or
80 to 240 kPa {0.8 to 2.4 kgf/cm²}
Type PSA6 :
200 to 340 kPa {2.0 to 3.5 kgf/cm²}
200 to 390 kPa {2.0 to 4.0 kgf/cm²}
Type PSA7R :
200 to 270 kPa {2.0 to 2.8 kgf/cm²}
200 to 305 kPa {2.0 to 3.0 kgf/cm²}

Supply pressure
Diaphragm actuator
Type PSA1, HA:120 to 390 kPa {1.2 to 4.0 kgf/cm²}
Type VA5: 120 to 270 kPa {1.2 to 2.8 kgf/cm²}
Spring type Piston actuator
Type PSA6: 400 to 500 kPa {4.0 to 5.0 kgf/cm²}
Type PSA7R: 400 kPa {4.0 kgf/cm²}
Piston actuator
Type VP: 290 to 490 kPa {3.0 to 5.0 kgf/cm²}

Note) Allowable differential pressure varies depending on the spring range and air supply pressure.

Air connection
Rc1/4 or 1/4NPT internal thread

Note) With type VA or VP, Rc1/4 adapter or 1/4NPT adapter is provided on Rc1/2 internal thread (also providing Rc3/8 adapter is possible).

Ambient temperature
-30 to 70 °C

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

Optional accessories
Positioner*, pressure regulator with filter, hand wheel*, limit switch, solenoid valve, motion transmitter, booster relay, lock-up valve, and others.

Note) 1) For the optional items, refer to specification sheets and installation drawing of respective accessories.

2) Accessories with an asterisk mark (*) are selected from among the following types depending on the actuators to be combined.

Actuator	Positioner		Hand wheel	
	P/P	I/P	Top	Side
PSA1	VPE	AVP/HEP	THM	SHM
HA2 to 4	HTP	AVP/HEP	THM	SHM
VA5	HTP	AVP/HEP	THM	SHM
PSA6	HTP/VPP	AVP/HEP	-	SHM
VP	VPP	AVP/HEP	-	SHM

Additional specification (by special order)
• Special inspection
Flow characteristics inspection, material inspection (Material certificate), nondestructive inspection, steam inspection, low temperature inspection.
• Seat chamfered flange
• With drain plug
• Double gland
• Steam jacket
• Oil/water free treatment
• Copper free treatment
• York material SCPH2 (York material of PSA1 is SCPH2.)
• Complies with High-pressure Gas Control Law
• Stainless steel (SUS304) atmosphere-exposed nuts and bolts.
• Special air piping and joint
• Sand-/dust-preventive measure
• Saline damage countermeasures
• Cold-area use specification
• Tropical-area use specification
• Vacuum service

Performance

Rated Cv valve
Refer to Table 2.

Flow characteristics
Refer to Figure 1.

Inherent rangeability
50 : 1 (Optional: 75 : 1)

Allowable differential pressure
Refer to Table 3 to Table 7.

Leakage specifications

• Contoured type plug
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

Without positioner: Within 3% F.S. (Within 5% F.S.) ((Within 9% F.S.))
With positioner : Within 1% F.S. ((Within 2% F.S.))

Linearity

Without positioner: Within ± 5% F.S. ((Within ±9% F.S.))
With positioner: Within ±1% F.S. ((Within ±2% F.S.))
(VPE: Within ± 3%, AVP/HEP: Within ± 2% F.S.)

Note) 1) When positioner is nor provided, operating performance may vary depending on types of packings used.
2) Parenthesized figures are applicable to Type PSA1.
3) Double parenthesized figures are applicable to type PSA6R.

Dimensions

Refer to Figure 2, Table 14 and Table 15.

Weight

Refer to Table 17.

Actuator orientation

Refer to Figure 3.

Finish

Blue (Munsell color 10B5/10) or silver, or other specified colors.

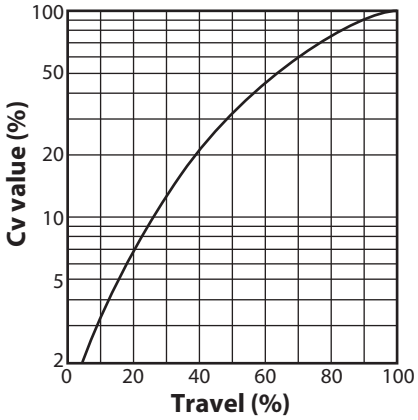
Table 1 Body / trim metal combinations and operating temperature ranges (°C)

Body material / Trim material		JIS	SCPH2	SCPH21	SCPH61	SCS11	SCS13A	SCS14A	SCS16A	SCS19A
		ASTM	A216WCB	A217WC6	A217C5	-	A351CF8	A351CF8M	A351CF3M	A351CF3
JIS	SUS440C		-5 to 425	-5 to 425	-5 to 425	-	-	-	-	-
JIS	SUS304 Stellite		-5 to 425	-5 to 550	-5 to 566	-	-196 to 550	-	-	-
JIS	SUS304 Stellite face		-5 to 425	-5 to 550	-5 to 566	-	-196 to 550	-	-	-
JIS	SUS316 Stellite		-5 to 425	-5 to 550	-5 to 566	-	-196 to 550	-196 to 550	-	-
JIS	SUS316 Stellite face		-5 to 425	-5 to 550	-5 to 566	-	-196 to 550	-196 to 550	-	-
JIS	SUS304L Stellite		-	-	-	-	-196 to 550	-	-	-196 to 450
JIS	SUS316L Stellite		-	-	-	-	-196 to 450	-196 to 450	-196 to 450	-196 to 450
JIS	SUS329J1 Stellite		-	-	-	-50 to 550	-	-196 to 550	-	-

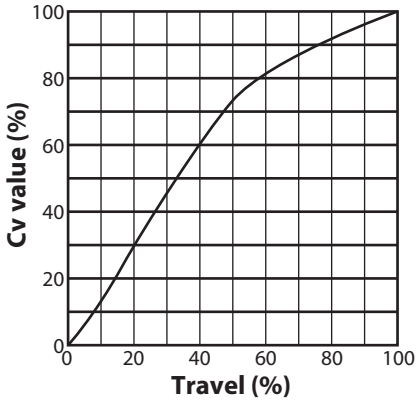
Note) 1)" ▭ " shows standard combination of valve body and trim materials.
2) SUS440C is recommended for valves for cavitation/ flushing service of water or for superheated service of water higher than 100ºC.

Table 2 Cv value and travel

Nominal size (inches)	1½			3			2½			3			4			6			8		
Port size (Cv value or inches)	Cv=4.0	Cv=6.3	1	Cv=6.3	1	1 ¼	1	1 ¼	1 ½	1 ¼	1 ½	2	1 ½	2	2 ½	2 ½	3	4	3	4	5
Rated Cv value	4.0	6.3	12	6.3	12	21	12	21	30	21	30	50	30	50	85	85	125	200	125	200	310
Rated travel (mm)	25						38									50			75		



a. Equal percentage characteristics (%CC: Metal seat)



b. Linear characteristics (LCC: Metal seat)

Figure 1 Flow characteristics

Allowable differential pressure

Contoured type metal seat (%CC, LCC) : PTFE packing

Valves with type PSA1, HA or VA actuator

Table 3 Air-to-close

Actuator Model No.	Supply pressure kPa{Kgf/cm²}	Spring range kPa{Kgf/cm²}	Positioner	Differential pressure kPa {kgf/cm²}																	
				1½			2			2½			3			4			6		
				Cv =4.0	Cv =6.3	1	Cv =6.3	1	1¼	1	1¼	1½	1¼	1¼	2	1¼	2	2¼	2¼	3	4
PSA1D	140 {1.4}	20 to 98 {0.2 to 1.0}	△	1020 {10.4}	550 {5.6}	320 {3.3}	550 {5.6}	320 {3.3}	200 {2.0}	—	—	—	—	—	—	—	—	—			
	160 {1.6}	20 to 98 {0.2 to 1.0}	✔	3920 {40.0} / 5100 {52.0}	2710 {28.0}	1570 {16.0}	2740 {28.0}	1570 {16.0}	970 {9.9}	—	—	—	—	—	—	—	—	—			
	390 {4.0}	80 to 240 {0.8 to 2.4}	✔	3920 {40.0} / 9810 {100}	3920 {40.0} / 8240 {84.0}	3920 {40.0} / 4710 {48.0}	3920 {40.0} / 8240 {84.0}	3920 {40.0} / 4710 {48.0}	2840 {29.0}	—	—	—	—	—	—	—	—	—	—	—	—
HA2D	140 {1.4}	20 to 98 {0.2 to 1.0}	△	1960 {20.0}	981 {10.0}	620 {6.3}	981 {10.0}	620 {6.3}	370 {3.8}	620 {6.3}	370 {3.8}	260 {2.7}	370 {3.8}	260 {2.7}	160 {1.6}	260 {2.7}	160 {1.6}	98 {1.0}	—	—	—
	160 {1.6}	20 to 98 {0.2 to 1.0}	✔	3920 {40.0} / 9810 {100}	3920 {40.0} / 5300 {54.0}	3100 {31.6}	3920 {40.0} / 5300 {54.0}	3100 {31.6}	1890 {19.3}	3100 {31.6}	1890 {19.3}	1340 {13.7}	1890 {19.3}	1340 {13.7}	760 {7.8}	1340 {13.7}	760 {7.8}	500 {5.1}	—	—	—
	390 {4.0}	80 to 240 {0.8 to 2.4}	✔	3920 {40.0} / 9810 {100}	3920 {40.0} / 9810 {100}	3920 {40.0} / 9220 {94.0}	3920 {40.0} / 9810 {100}	3920 {40.0} / 9220 {94.0}	3920 {40.0} / 5590 {57.0}	3920 {40.0} / 9220 {94.0}	3920 {40.0} / 5590 {57.0}	3920 {40.0} / 4020 {41.0}	3920 {40.0} / 5590 {57.0}	3920 {40.0} / 4020 {41.0}	2130 {21.7}	3920 {40.0} / 4020 {41.0}	2130 {21.7}	1460 {14.9}	—	—	—
HA3D	140 {1.4}	20 to 98 {0.2 to 1.0}	△	3430 {35.0}	1860 {19.0}	1100 {11.2}	1860 {19.0}	1100 {11.2}	670 {6.8}	1100 {11.2}	670 {6.8}	470 {4.8}	670 {6.8}	470 {4.8}	270 {2.8}	470 {4.8}	270 {2.8}	170 {1.7}	170 {1.7}	120 {1.2}	70 {0.7}
	160 {1.6}	20 to 98 {0.2 to 1.0}	✔	3920 {40.0} / 9810 {100}	3920 {40.0} / 9510 {97.0}	3920 {40.0} / 5490 {56.0}	3920 {40.0} / 9510 {97.0}	3920 {40.0} / 5490 {56.0}	3350 {34.2}	3920 {40.0} / 5490 {56.0}	3350 {34.2}	2370 {24.2}	3350 {34.2}	2370 {24.2}	1370 {14.0}	2370 {24.2}	1370 {14.0}	860 {8.8}	860 {8.8}	610 {6.2}	340 {3.5}
	390 {4.0}	80 to 240 {0.8 to 2.4}	✔	3920 {40.0} / 9810 {100}	3920 {40.0} / 9810 {100}	3920 {40.0} / 9810 {100}	3920 {40.0} / 9810 {100}	3920 {40.0} / 9810 {100}	3920 {40.0} / 9810 {100}	3920 {40.0} / 9810 {100}	3920 {40.0} / 9810 {100}	3920 {40.0} / 7060 {72.0}	3920 {40.0} / 9810 {100}	3920 {40.0} / 7060 {72.0}	3920 {40.0} / 4120 {42.0}	3920 {40.0} / 7060 {72.0}	3920 {40.0} / 4120 {42.0}	2600 {26.5}	2600 {26.5}	1830 {18.7}	1030 {10.5}

Table 4

Actuator Model No.	Supply pressure kPa{Kgf/cm²}	Spring range kPa{Kgf/cm²}	Positioner	Differential pressure kPa {kgf/cm²}														
				2½			3			4			6			8		
				1	1¼	1½	1¼	1½	2	1½	2	2½	2½	3	4	3	4	5
HA4D	140 {1.4}	20 to 98 {0.2 to 1.0}	△	1860 {19.0}	1080 {11.0}	810 {8.3}	1080 {11.0}	810 {8.3}	470 {4.8}	810 {8.3}	470 {4.8}	290 {3.0}	290 {3.0}	220 {2.2}	120 {1.2}	220 {2.2}	120 {1.2}	69 {0.7}
	160 {1.6}	20 to 98 {0.2 to 1.0}	✔	3920 {40.0} / 9410 {96.0}	3920 {40.0} / 5780 {59.0}	3920 {40.0}	3920 {40.0} / 5780 {59.0}	3920 {40.0}	2370 {24.2}	3920 {40.0}	2370 {24.2}	1490 {15.2}	1490 {15.2}	1050 {10.7}	600 {6.1}	1050 {10.7}	600 {6.1}	380 {3.9}
	390 {4.0}	80 to 240 {0.8 to 2.4}	✔	3920 {40.0} / 9810 {100}	3920 {40.0} / 9810 {100}	3920 {40.0} / 9810 {100}	3920 {40.0} / 9810 {100}	3920 {40.0} / 9810 {100}	3920 {40.0} / 7060 {72.0}	3920 {40.0} / 9810 {100}	3920 {40.0} / 7060 {72.0}	3920 {40.0} / 4410 {45.0}	3920 {40.0} / 4410 {45.0}	3160 {32.0}	1780 {18.2}	3160 {32.2}	1780 {18.2}	1140 {11.6}
VA5D	140 {1.4}	20 to 98 {0.2 to 1.0}	△	2550 {26.0}	1570 {16.0}	1080 {11.0}	1570 {16.0}	1080 {11.0}	650 {6.6}	1080 {11.0}	650 {6.6}	410 {4.2}	410 {4.2}	280 {2.9}	160 {1.6}	280 {2.9}	160 {1.6}	110 {1.1}
	160 {1.6}	20 to 98 {0.2 to 1.0}	✔	3920 {40.0} / 9810 {100}	3920 {40.0} / 7840{ 80.0}	3920 {40.0} / 5590 {57.0}	3920 {40.0} / 7840 {80.0}	3920 {40.0} / 5590 {57.0}	3240 {33.0}	3920 {40.0} / 5590 {57.0}	3240 {33.0}	2040 {20.8}	2040 {20.8}	1440 {14.7}	810 {8.3}	1440 {14.7}	810 {8.3}	810 {8.3}

Valves with type PSA1, HA or VA actuator

Table 5 Air-to-open

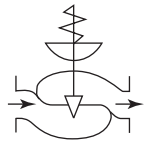
Actuator Model No.	Supply pressure kPa {Kgf/cm²}	Spring range kPa {Kgf/cm²}	Positioner	Differential pressure (Upper side: by nominal size, Lower side: by port size) kPa {kgf/cm²}																	
				1½	2	2½	3	4	6												
				Cv =4.0	Cv =6.3	1	Cv =6.3	1	1¼	1	1¼	1½	1¼	1¼	2	1¼	2	2¼	2¼	3	4
PSA1R	140 {1.4}	20 to 98 {0.2 to 1.0}	△	981 {10.0}	550 {5.6}	320 {3.3}	550 {5.6}	320 {3.3}	200 {2.0}	—	—	—	—	—	—	—	—	—			
	270 {2.8}	80 to 240 {0.8 to 2.4}	✔	3920 {40.0} / 7060 {72.0}	3820 {39.0}	2160 {22.0}	3820 {39.0}	2160 {22.0}	1270 {13.0}	—	—	—	—	—	—	—	—	—			
HA2R	140 {1.4}	20 to 98 {0.2 to 1.0}	△	1960 {20.0}	981 {10.0}	620 {6.3}	981 {10.0}	620 {6.3}	370 {3.8}	620 {6.3}	370 {3.8}	260 {2.7}	370 {3.8}	260 {2.7}	160 {1.6}	260 {2.7}	160 {1.6}	98 {1.0}	—	—	—
	270 {2.8}	80 to 240 {0.8 to 2.4}	✔	3920 {40.0} / 9810 {100}	3920 {40.0} / 7450 {76.0}	3920 {40.0} / 4310 {44.0}	3920 {40.0} / 7450 {76.0}	3920 {40.0} / 4310 {44.0}	2650 {27.0}	3920 {40.0} / 4310 {44.0}	2650 {27.0}	1380 {14.0}	2650 {27.0}	1380 {14.0}	1090 {11.1}	1380 {14.0}	1090 {11.1}	680 {6.9}	—	—	—
HA3R	140 {1.4}	20 to 98 {0.2 to 1.0}	△	3430 {35.0}	1860 {19.0}	1100 {11.2}	1860 {19.0}	1100 {11.2}	670 {6.8}	1100 {11.2}	670 {6.8}	470 {4.8}	670 {6.8}	470 {4.8}	270 {2.8}	470 {4.8}	270 {2.8}	170 {1.7}	170 {1.7}	120 {1.2}	70 {0.7}
	270 {2.8}	80 to 240 {0.8 to 2.4}	✔	3920 {40.0} / 9810 {100}	3920 {40.0} / 9810 {100}	3920 {40.0} / 7650 {78.0}	3920 {40.0} / 9810 {100}	3920 {40.0} / 7650 {78.0}	3920 {40.0} / 4610 {47.0}	3920 {40.0} / 7650 {78.0}	3920 {40.0} / 4610 {47.0}	3330 {34.0}	3920 {40.0} / 4610 {47.0}	3330 {34.0}	1920 {19.6}	3330 {34.0}	1920 {19.6}	1210 {12.3}	1210 {12.3}	850 {8.7}	480 {4.9}

Table 6

Actuator Model No.	Supply pressure kPa{Kgf/cm²}	Spring range kPa{Kgf/cm²}	Positioner	Differential pressure (Upper side: by nominal size, Lower side: by port size) kPa {Kgf/cm²}														
				2½			3			4			6			8		
				1	1¼	1½	1¼	1½	2	1½	2	2½	2½	3	4	3	4	5
HA4R	140 {1.4}	20 to 98 {0.2 to 1.0}	△	1860 {19.0}	1080 {11.0}	820 {8.3}	1080 {11.0}	820 {8.3}	470 {4.8}	820 {8.3}	470 {4.8}	290 {3.0}	290 {3.0}	220 {2.2}	120 {1.2}	220 {2.2}	120 {1.2}	70 {0.7}
	270 {2.8}	80 to 240 {0.8 to 2.4}	✔	3920 {40.0} / 9810 {100}	3920 {40.0} / 8040 {82.0}	3920 {40.0} / 5690 {58.0}	3920 {40.0} / 8040 {82.0}	3920 {40.0} / 5690 {58.0}	3090 {31.5}	3920 {40.0} / 5690 {58.0}	3090 {31.5}	2090 {21.3}	2090 {21.3}	1470 {15.0}	830 {8.5}	1470 {15.0}	830 {8.5}	530 {5.4}
VA5R	140{1.4}	20 to 98 {0.2 to 1.0}	△	2550 {26.0}	1570 {16.0}	1080 {11.0}	1570 {16.0}	1080 {11.0}	650 {6.6}	1080 {11.0}	650 {6.6}	410 {4.2}	410 {4.2}	280 {2.9}	170 {1.6}	280 {2.9}	170 {1.7}	110 {1.1}
	270 {2.8}	80 to 240 {0.8 to 2.4}	✔	3920 {40.0} / 9810 {100}	3920 {40.0} / 9810 {100}	3920 {40.0} / 7840 {80.0}	3920 {40.0} / 9810 {100}	3920 {40.0} / 7840 {80.0}	3920 {40.0} / 4510 {46.0}	3920 {40.0} / 7840 {80.0}	3920 {40.0} / 4510 {46.0}	2860 {29.2}	2860 {29.2}	2020 {20.6}	1140 {11.6}	2020 {20.6}	1140 {11.6}	720 {7.4}
PSA6R	400 {4.0}	200 to 340 {2.0 to 3.5}	✔	3920 {40.0} / 9810 {100}	3920 {40.0} / 9810 {100}	3920 {40.0} / 9810 {100}	3920 {40.0} / 9810 {100}	3920 {40.0} / 9810 {100}	3920 {40.0} / 9810 {100}	3920 {40.0} / 9810 {100}	3920 {40.0} / 9810 {100}	3920 {40.0} / 5980 {61.0}	—	—	—	—	—	—
	500 {5.0}	200 to 390 {2.0 to 4.0}	✔	—	—	—	—	—	—	—	—	—	3920 {40.0} / 5980 {61.0}	3920 {40.0} / 4220 {43.0}	2370 {24.2}	—	—	—

Note) 1)" ▭ " shows a model with standard actuator.

2) ✔: Positioner is necessary. △: Can be operated either with or without positioner.

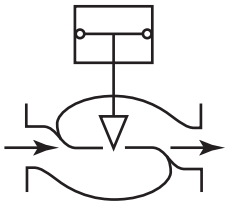
3) Take care not to cause the maximum allowable differential pressure to exceed the maximum operating pressure designated by ANSI B16. 34-1981 or JIS B2201-1984.

4) The upper figures denote the operating allowable differential pressure. The lower denote allowable differential pressure at full closure.

Valves with type VP actuator

Table 7 Air-to-close and Air-to-open

Actuator Model No.	Supply Pressure kPa{Kgf/cm²}	Differential pressure (Upper side: by nominal size, Lower side: by port size) kPa {Kgf/cm²}														
		2½			3			4			6			8		
		1	1¼	1½	1¼	1½	2	1½	2	2½	2½	3	4	3	4	5
VP5	290 {3.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3610 {36.8}	2030 {20.7}	3610 {36.8}	2030 {20.7}	1290 {13.2}
		9810 {100}	9810 {100}	9810 {100}	9810 {100}	9810 {100}	8430 {86.0}	9810 {100}	8430 {86.0}	5100 {52.0}	5100 {52.0}					
	390 {4.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	27.8 {2730}	3920 {40.0}	2730 {27.8}	1740 {17.8}
		9810 {100}	9810 {100}	9810 {100}	9810 {100}	9810 {100}	9810 {100}	9810 {100}	9810 {100}	6860 {70.0}	6860 {70.0}	49.0 {4800}		4800 {49.0}		
	490 {5.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3420 {34.9}	3920 {40.0}	3420 {34.9}	2200 {22.4}
		9810 {100}	9810 {100}	9810 {100}	9810 {100}	9810 {100}	9810 {100}	9810 {100}	9810 {100}	8630 {88.0}	8630 {88.0}	6080 {62.0}		6080 {62.0}		
VP6	290 {3.0}							3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3620 {36.9}	3920 {40.0}	3620 {36.9}	2310 {23.6}
								9810 {100}	9810 {100}	9120 {93.0}	9120 {93.0}	6370 {65.0}		6370 {65.0}		
	390 {4.0}							3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3120 {31.8}
								9810 {100}	9810 {100}	9810 {100}	9810 {100}	8630 {88.0}	49.0 {4800}	8630 {88.0}	4800 {49.0}	
	490 {5.0}							3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}
								9810 {100}	9810 {100}	9810 {100}	9810 {100}	9810 {100}	6080 {62.0}	9810 {100}	6080 {62.0}	
VP7	290 {3.0}										3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3480 {35.5}
											9810 {100}	9710 {99.0}	5490 {56.0}	9710 {99.0}	5490 {56.0}	
	390 {4.0}										3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}
											9810 {100}	9810 {100}	7160 {73.0}	9810 {100}	7160 {73.0}	4610 {47.0}
	490 {5.0}										3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}
											9810 {100}	9810 {100}	9020 {92.0}	9810 {100}	9020 {92.0}	5880 {60.0}



Note) 1) When a backup system for pressure drop at the air source is used, select the allowable differential pressure from whichever is lower constant supplied air pressure or backup system set pressure (trip pressure).

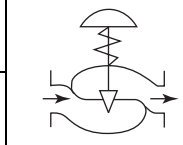
2) Take care not to cause the maximum allowable differential pressure to exceed the maximum operating pressure designated by ANSI B16. 34-1981 or JIS B2201-1984.

3) The upper figures denote the operating allowable differential pressure. The lower denote allowable differential pressure at full closure.

Contoured type metal seat (%CC, LCC) : Graphite packing “P6610CH+P6528” (+230 to +500 °C)

Valves with type PSA, HA or VA actuator

Table 8 Air-to-close

Actuator Model No.	Supply pressure kPa{Kgf/cm²}	Spring range kPa{Kgf/cm²}	Differential pressure kPa {kgf/cm²}																				
			1½			2			2½			3			4			6			8		
			Cv =4.0	Cv =6.3	1	Cv =6.3	1	1¼	1	1¼	1½	1¼	1½	2	1½	2	2½	2¼	3	4	3	4	5
HA2D	390 {4.0}	80 to 240 {0.8 to 2.4}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3380 {34.4}	3920 {40.0}	3380 {34.4}	1950 {19.8}	3380 {34.4}	1950 {19.8}	1230 {12.5}	—	—	—	—	—	—
			9810 {100}	9810 {100}	7830 {79.8}	9810 {100}	7830 {79.8}		7830 {79.8}														
HA3D			3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3470 {35.3}	3920 {40.0}	3470 {35.3}	2180 {22.2}	2180 {22.2}	1540 {15.7}	860 {8.7}	—	—	—
			9810 {100}	9810 {100}	9810 {100}	9810 {100}	9810 {100}	8470 {86.3}	9810 {100}	8470 {86.3}	6010 {61.2}	8470 {86.3}	6010 {61.2}		6010 {61.2}								
HA4D			—					—	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3860 {39.3}	3860 {39.3}	2720 {27.7}	1530 {15.6}	2720 {27.7}	1530 {15.6}	980 {9.9}
									9810 {100}	9810 {100}	9810 {100}	9810 {100}	9810 {100}	6140 {62.6}	9810 {100}	6140 {62.6}							
VA5D	270 {2.8}	40 to 200 {0.4 to 2.0}	—					—	—	—	—	—	—	—	3920 {40.0}	2910 {29.6}	1830 {18.6}	1830 {18.6}	1290 {13.1}	720 {7.3}	1290 {13.1}	720 {7.3}	480 {4.8}
															5040 {51.3}								

Note) 1) Positioner is employed in general.

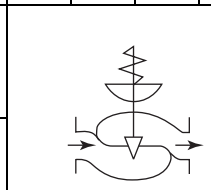
2) Take care not to cause the maximum allowable differential pressure to exceed the maximum operating pressure designated by ANSI B 16. 34-1981 or JIS B2201-1984.

3) The upper figures denote the operating allowable differential pressure. The lower denote allowable differential pressure at full closure.

Valves with type PSA, HA or VA actuator

Table 9 Air-to-open

Actuator Model No.	Supply pressure kPa{Kgf/cm²}	Spring range kPa{Kgf/cm²}	Differential pressure kPa {kgf/cm²}																	
			1½			2			2½			3			4			6		
			Cv =4.0	Cv =6.3	1	Cv =6.3	1	1¼	1	1¼	1½	1¼	1½	2	1½	2	2½	2¼	3	4
HA2R	270 {2.8}	80 to 240 {0.8 to 2.4}	3920 {40.0}	3920 {40.0}	3410 {34.7}	3920 {40.0}	3410 {34.7}	2080 {21.2}	3410 {34.7}	2080 {21.2}	1470 {14.9}	2080 {21.2}	1470 {14.9}	850 {8.6}	1470 {14.9}	850 {8.6}	530 {5.4}	—	—	—
			9810 {100}	5900 {60.1}		5900 {60.1}														
HA3R			3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3690 {37.6}	3920 {40.0}	3690 {37.6}	2610 {26.6}	3690 {37.6}	2610 {26.6}	1510 {15.3}	2610 {26.6}	1510 {15.3}	950 {9.6}	950 {9.6}	670 {6.8}	370 {3.7}
			9810 {100}	9810 {100}	6050 {61.6}	9810 {100}	6050 {61.6}		6050 {61.6}											

Actuator Model No.	Supply pressure kPa{Kgf/cm²}	Spring range kPa{Kgf/cm²}	Differential pressure kPa {kgf/cm²}																	
			2½			3			4			6			8					
			1	1¼	1½	1¼	1½	2	1½	2	2½	2¼	3	4	3	4	5			
HA4R	270 {2.8}	80 to 240 {0.8 to 2.4}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	2750 {28.0}	3920 {40.0}	2750 {28.0}	1730 {17.6}	1730 {17.6}	1220 {12.4}	680 {6.9}	1220 {12.4}	680 {6.9}	440 {4.4}			
			9810 {100}	6720 {68.5}	4770 {48.6}	6720 {68.5}	4770 {48.6}		4770 {48.6}											
VA5R			3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3570 {36.4}	3920 {40.0}	3570 {36.4}	2250 {22.9}	2250 {22.9}	1580 {16.1}	890 {9.0}	1580 {16.1}	890 {9.0}	570 {5.8}			
			9810 {100}	8720 {88.9}	6180 {63.0}	8720 {88.9}	6180 {63.0}		6180 {63.0}											
PSA6R	400 {4.0}*1	200 to 340 {2.0 to 3.5}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	—	—	—	—	—	—			
			9810 {100}	9810 {100}	9810 {100}	9810 {100}	9810 {100}	9810 {100}	9810 {100}	9510 {96.9}	5980 {60.9}									
	500 {5.0}*2	200 to 390 {2.0 to 4.0}	—	—	—	—	—	—	—	—	—	3920 {40.0}	3920 {40.0}	2370 {24.1}	—	—	—			
												5980 {60.9}	4220 {43.0}							
	400 {4.0}*3	200 to 340 {2.0 to 3.5}	—	—					—	—	—	—	—	—	3920 {40.0}	2370 {24.1}	1520 {15.5}			
															4220 {43.0}					
PSA7R	400 {4.0}*2	200 to 270 {2.0 to 2.8}	—	—					—	—	—	3920 {40.0}	3920 {40.0}	3920 {40.0}	—	—	—			
												9810 {100}	7110 {72.5}	4000 {40.7}						
	400 {4.0}*3	200 to 305 {2.0 to 3.0}	—	—	—	—	—	—	—	—	—	—	—	—	3920 {40.0}	3920 {40.0}	2560 {26.1}			
															7110 {72.5}	4000 {40.7}				

Note) 1) Positioner is employed in general.

2) Take care not to cause the maximum allowable differential pressure to exceed the maximum operating pressure designated by ANSI B 16. 34-1981 or JIS B2201-1984.

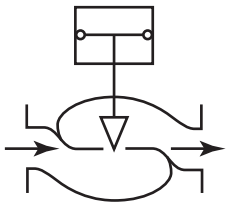
3) The upper figures denote the operating allowable differential pressure. The lower denote allowable differential pressure at full closure.

*4) *1…Applicable to valve sizes of 2½ to 4 inches, *2…Applicable to valve size of 6 inches, *3…Applicable to valve size 8 inches.*

Contoured type metal seat (%CC, LCC) : Graphite packing "P6610CH+P6528" (+230 to +500 °C)
Valves with type VP actuator

Table 10 Air-to-close and Air-to-open

Actuator Model No.	Supply pressure kPa{Kgf/cm²}	Differential pressure kPa {kgf/cm²}														
		2½			3			4			6			8		
		1	1¼	1½	1¼	1½	2	1½	2	2½	2¼	3	4	3	4	5
VP5	290 {3.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3770 {38.4}	3770 {38.4}	2660 {27.1}	1490 {15.1}	2660 {27.1}	1490 {15.1}	950 {9.6}
		9810 {100}	9810 {100}	9810 {100}	9810 {100}	9810 {100}	5980 {60.9}	9810 {100}	5980 {60.9}							
	390 {4.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	2210 {22.5}	3920 {40.0}	2210 {22.5}	1410 {14.3}
		9810 {100}	9810 {100}	9810 {100}	9810 {100}	9810 {100}	8840 {90.1}	9810 {100}	8840 {90.1}	5560 {56.6}	5560 {56.6}					
	490 {5.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	2920 {29.7}	3920 {40.0}	2920 {29.7}	1870 {19.0}
		9810 {100}	9810 {100}	9810 {100}	9810 {100}	9810 {100}	9810 {100}	9810 {100}	9810 {100}	7360 {75.0}	7360 {75.0}	5190 {52.9}		5190 {52.9}		
VP6	290 {3.0}	—	—	—	—	—	—	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	2540 {25.9}	3920 {40.0}	2540 {25.9}	1620 {16.5}
								9810 {100}	9810 {100}	6390 {65.1}	6390 {65.1}	4510 {45.9}		4510 {45.9}		
	390 {4.0}	—	—	—	—	—	—	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3740 {38.1}	3920 {40.0}	3740 {38.1}	2390 {24.3}
								9810 {100}	9810 {100}	9440 {96.2}	9440 {96.2}	6660 {67.9}		6660 {67.9}		
	490 {5.0}	—					—	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3170 {32.3}
								9810 {100}	9810 {100}	9810 {100}	9810 {100}	8810 {89.8}	4950 {50.4}	8810 {89.8}	4950 {50.4}	
VP7	290 {3.0}	—					—	—	—	—	3920 {40.0}	3920 {40.0}	3900 {39.7}	3920 {40.0}	3900 {39.7}	2490 {25.3}
											9810 {100}	6940 {70.7}		6940 {70.7}		
	390 {4.0}	—					—	—	—	—	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3680 {37.5}
											9810 {100}	9810 {100}	5760 {58.7}	9810 {100}	5760 {58.7}	
	490 {5.0}	—	—	—	—	—	—	—	—	—	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}
											9810 {100}	9810 {100}	7620 {77.7}	9810 {100}	7620 {77.7}	4870 {49.6}



Note) 1) When a backup system for pressure drop at the air source is used, select the allowable differential pressure from whichever is lower constant supplied air pressure or backup system set pressure (trip pressure).

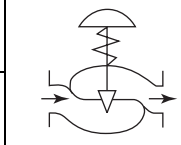
2) Take care not to cause the maximum allowable differential pressure to exceed the maximum operating pressure designated by ANSI B16. 34-1981 or JIS B2201-1984.

3) The upper figures denote the operating allowable differential pressure. The lower denote allowable differential pressure at full closure.

Contoured type metal seat (%CC, LCC) : Graphite packing “P6610CH+P8590” (+500 to +566 °C)

Valves with type PSA, HA or VA actuator

Table 11 Air-to-close

Actuator Model No.	Supply pressure kPa{Kgf/cm²}	Spring range kPa{Kgf/cm²}	Differential pressure kPa {kgf/cm²}																				
			1½			2			2½			3			4			6			8		
			Cv =4.0	Cv =6.3	1	Cv =6.3	1	1¼	1	1¼	1½	1¼	1½	2	1½	2	2½	2¼	3	4	3	4	5
HA2D	390 {4.0}	80 to 240 {0.8 to 2.4}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3170 {32.3}	3920 {40.0}	3170 {32.3}	1830 18.8}	3170 {32.3}	1830 {18.6}	1150 {11.7}	—	—	—	—	—	—
			9810 {100}	9810 {100}	7320 {74.6}	9810 {100}	7320 {74.6}	4470 {45.5}	7320 {74.6}	4470 {45.5}		4470 {45.5}											
HA3D			3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3240 {33.0}	3920 {40.0}	3240 {33.0}	2040 {20.8}	2040 {20.8}	1440 {14.6}	810 {8.2}	—	—	—
			9810 {100}	9810 {100}	9810 {100}	9810 {100}	9810 {100}	7930 {80.8}	9810 {100}	7930 {80.8}	5620 {57.3}	7930 {80.8}	5620 {57.3}		5620 {57.3}								
HA4D			—					—	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3660 {37.3}	3660 {37.3}	2580 {26.3}	1450 {14.7}	2580 {26.3}	1450 {14.7}	930 {9.4}
									9810 {100}	9810 {100}	9810 {100}	9810 {100}	9810 {100}	9810 {100}	9810 {100}	5820 {59.3}							
VA5D	270 {2.8}	40 to 200 {0.4 to 2.0}	—					—	—	—	—	—	—	—	3920 {40.0}	2380 {24.2}	1500 {15.2}	1500 {15.2}	1050 {10.7}	590 {6.0}	1050 {10.7}	590 {6.0}	380 {3.8}
															4120 {42.0}								

Note) 1) Positioner is employed in general.

2) Take care not to cause the maximum allowable differential pressure to exceed the maximum operating pressure designated by ANSI B 16. 34-1981 or JIS B2201-1984.

3) The upper figures denote the operating allowable differential pressure. The lower denote allowable differential pressure at full closure.

Valves with type PSA, HA or VA actuator

Table 12 Air-to-open

Actuator Model No.	Supply pressure kPa{Kgf/cm²}	Spring range kPa{Kgf/cm²}	Differential pressure kPa {kgf/cm²}																	
			1½			2			2½			3			4			6		
			Cv =4.0	Cv =6.3	1	Cv =6.3	1	1¼	1	1¼	1½	1¼	1½	2	1½	2	2½	2¼	3	4
HA2R	270 {2.8}	80 to 240 {0.8 to 2.4}	3920 {40.0}	3920 {40.0}	2900 {29.5}	3920 {40.0}	2900 {29.5}	1770 {18.0}	2900 {29.5}	1770 {18.0}	1250 {12.7}	1770 {18.0}	1250 {12.7}	720 {7.3}	1250 {12.7}	720 {7.3}	530 {5.4}	—	—	—
			9260 {94.4}	5020 {51.1}		5020 {51.1}														
HA3R			3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3140 {32.0}	3920 {40.0}	3140 {32.0}	2230 {22.7}	3140 {32.0}	2230 {22.7}	1280 {13.0}	2230 {22.7}	1280 {13.0}	810 {8.2}	810 {8.2}	570 {5.8}	320 {3.2}
			9810 {100}	8920 {90.9}	5150 {52.5}	8920 {90.9}	5150 {52.5}		5150 {52.5}											

Actuator Model No.	Supply pressure kPa{Kgf/cm²}	Spring range kPa{Kgf/cm²}	Differential pressure kPa {kgf/cm²}																	
			2½			3			4			6			8					
			1	1¼	1½	1¼	1½	2	1½	2	2½	2¼	3	4	3	4	5			
HA4R	270 {2.8}	80 to 240 {0.8 to 2.4}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	2430 {24.7}	3920 {40.0}	2750 {28.0}	1530 {15.6}	1530 {15.6}	1080 {11.0}	600 {6.1}	1080 {11.0}	600 {6.1}	390 {3.9}			
			9810 {100}	5950 {60.6}	4220 {43.0}	5950 {60.6}	4220 {43.0}		4220 {43.0}											
VA5R			3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3040 {30.9}	3920 {40.0}	3040 {30.9}	1910 {19.4}	1910 {19.4}	1350 {13.7}	760 {7.7}	1350 {13.7}	760 {7.7}	480 {4.8}			
			9810 {100}	7430 {75.7}	5270 {53.7}	7430 {75.7}	5270 {53.7}		5270 {53.7}											
PSA6R	400 {4.0}*1	200 to 340 {2.0 to 3.5}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	—	—	—	—	—	—			
			9810 {100}	9810 {100}	9810 {100}	9810 {100}	9810 {100}	9290 {94.7}	9810 {100}	9290 {94.7}	5850 {59.6}									
	500 {5.0}*2	200 to 390 {2.0 to 4.0}	—	—	—	—	—	—	—	—	—	3920 {40.0}	3920 {40.0}	2320 {23.6}	—	—	—			
												5850 {59.6}	4130 {42.1}							
	400 {4.0}*3	200 to 340 {2.0 to 3.5}	—	—					—	—	—	—	—	—	3920 {40.0}	2320 {23.6}	1480 {15.0}			
															4130 {42.1}					
PSA7R	400 {4.0}*2	200 to 270 {2.0 to 2.8}	—	—					-	-	-	3920 {40.0}	3920 {40.0}	3670 {37.4}	—	—	—			
												9260 {94.4}	6530 {66.5}							
	400 {4.0}*3	200 to 305 {2.0 to 3.0}	—	—	—	—	—	—	—	—	—	—	—	—	3920 {40.0}	3670 {37.4}	2350 {23.9}			
															6530 {66.5}					

Note) 1) Positioner is employed in general.

2) Take care not to cause the maximum allowable differential pressure to exceed the maximum operating pressure designated by ANSI B 16. 34-1981 or JIS B2201-1984.

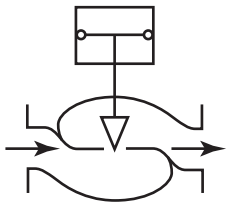
3) The upper figures denote the operating allowable differential pressure. The lower denote allowable differential pressure at full closure.

*4) *1…Applicable to valve sizes of 2½ to 4 inches, *2…Applicable to valve size of 6 inches, *3…Applicable to valve size 8 inches.*

Contoured type metal seat (%CC, LCC) : Graphite packing "P6610CH+P8590" (+500 to +566 °C)
Valves with type VP actuator

Table 13 Air-to-close and Air-to-open

Actuator Model No.	Supply pressure kPa{Kgf/cm²}	Differential pressure kPa {kgf/cm²}														
		2½			3			4			6			8		
		1	1¼	1½	1¼	1½	2	1½	2	2½	2¼	3	4	3	4	5
VP5	290 {3.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3590 {36.6}	3590 {36.6}	2530 {25.7}	1420 {14.4}	2530 {25.7}	1420 {14.4}	910 {9.2}
		9810 {100}	9810 {100}	9810 {100}	9810 {100}	9810 {100}	5700 {58.1}	9810 {100}	5700 {58.1}							
	390 {4.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3800 {38.7}	2130 {21.7}	3800 {38.7}	2130 {21.7}	1360 {13.8}
		9810 {100}	9810 {100}	9810 {100}	9810 {100}	9810 {100}	8550 {87.1}	9810 {100}	8550 {87.1}	5380 {54.8}	5380 {54.8}					
	490 {5.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	2850 {29.0}	3920 {40.0}	2850 {29.0}	1820 {18.5}
		9810 {100}	9810 {100}	9810 {100}	9810 {100}	9810 {100}	9810 {100}	9810 {100}	9810 {100}	7180 {73.2}	7180 {73.2}	5070 {51.6}		5070 {51.6}		
VP6	290 {3.0}	—	—	—	—	—	—	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	2410 {24.5}	3920 {40.0}	2410 {24.5}	1540 {15.7}
								9810 {100}	9670 {98.6}	6090 {62.1}	6090 {62.1}	4300 {43.8}		4300 {43.8}		
	390 {4.0}	—	—	—	—	—	—	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3620 {36.9}	3920 {40.0}	3620 {36.9}	2320 {23.6}
								9810 {100}	9810 {100}	9140 {93.2}	9140 {93.2}	6450 {65.7}		6450 {65.7}		
	490 {5.0}	—					—	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3090 {31.5}
								9810 {100}	9810 {100}	9810 {100}	9810 {100}	8600 {87.6}	4830 {49.2}	8600 {87.6}	4830 {49.2}	
VP7	290 {3.0}	—					—	—	—	—	3920 {40.0}	3920 {40.0}	3710 {37.8}	3920 {40.0}	3710 {37.8}	2370 {24.1}
											9360 {95.4}	6600 {67.3}		6600 {67.3}		
	390 {4.0}	—					—	—	—	—	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3560 {36.3}
											9810 {100}	9810 {100}	5570 {56.7}	9810 {100}	5570 {56.7}	
	490 {5.0}	—	—	—	—	—	—	—	—	—	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}
											9810 {100}	9810 {100}	7430 {75.7}	9810 {100}	7430 {75.7}	4750 {48.4}



Note) 1) When a backup system for pressure drop at the air source is used, select the allowable differential pressure from whichever is lower constant supplied air pressure or backup system set pressure (trip pressure).

2) Take care not to cause the maximum allowable differential pressure to exceed the maximum operating pressure designated by ANSI B16. 34-1981 or JIS B2201-1984.

3) The upper figures denote the operating allowable differential pressure. The lower denote allowable differential pressure at full closure.

DIMENSIONS

Table 14 Face-to-face dimensions (Unit: mm)

Nominal size (inches)	A							
	JIS10K FF, RF ANSI 125FF JPI 125FF ANSI 150RF JPI 150RF *	JIS 16KRF	JIS 20KRF JIS 30KRF ANSI 300RF JPI 300RF *	JIS 40KFF, RF ANSI 600RF JPI 600RF *	JIS 16K Tongue and groove Male and female	JIS 20K Tongue and groove Male and female	JIS 30K Tongue and groove Male and female	JIS 40K Tongue and groove Male and female
1½	222	231	235	251	235	236	248	251
2	254	263	267	286	265	267	276	286
2½	276	288	292	311	290	292	303	311
3	298	313	317	337	310	317	326	337
4	352	364	368	394	360	368	379	394
6	451	465	473	508	475	473	486	508
8	543	560	568	610	570	568	580	610

Table 15 (Unit: mm)

Nominal size (inches)	ANSI 150RJ JPI 150RJ	ANSI 300RJ JPI 300RJ	ANSI 600RJ JPI 600RJ	ANSI 300LG JPI 300LG	ANSI 600LG JPI 600LG	ANSI 150 JPI 150 (SW,BW) *	ANSI 300, 600 JPI 300, 600 (SW,BW) *
1½	235	248	251	244	248	251	251
2	267	283	289	276	283	286	286
2½	289	308	314	302	308	311	311
3	311	333	340	327	333	337	337
4	365	384	397	378	391	394	394
6	464	489	511	483	505	473	508
8	556	584	613	578	606	568	610

*Note) * : Face-to-face dimensions conform to following standards.*
-IEC 60534-3-1:2001
-IEC 60534-3-3:2001 (2½ inches or over)
-JIS B 2005-3-1:2005
-JIS B 2005-3-3:2005 (2½ inches or over)

Table 16 External dimensions (Unit: mm)

Nominal size (inches)	Actuator Model No.	H				B	ϕB	E
		Plain bonnet	Extension Bonnet type 1	Extension bonnet type 2				
				Integral cast type	Welded type			
1 ½	PSA1D, R	446	631	746	986	230	218	70
	HA2D, R	500	665	780	1020	281	267	
	HA3D, R	590	760	875	1140	363	350	
2	PSA1D, R	446	636	751	991	230	218	80
	HA2D, R	500	670	785	1025	281	267	
	HA3D, R	595	765	875	1140	363	350	
2 ½	HA2D, R	575	745/755	880	1130	281	267	88
	HA3D, R	630	800/810	930	1180	363	350	
	HA4D, R	865	1035/1045	1165	1495	520	470	
3	HA2D, R	580	755/765	900	1135	281	267	98
	HA3D, R	635	810/820	955	1190	363	350	
	HA4D, R	870	1045/1055	1190	1505	520	470	
4	HA2D, R	610	810/820	915	1150	281	267	113
	HA3D, R	660	860/870	1020	1205	363	350	
	HA4D, R	890	1100/1110	1255	1520	520	470	
	VA5D	1300	1515	1710	1940	-	620	
	VA5R	1420	1635	1820	2050	-	620	
	PSA6R	1255	1470	1655	1885	-	476	
	VP5	940	1155	1340	1570	-	345	
6	HA3D, R	785	1020/1045	1250	1385	363	350	170
	HA4D, R	955	1190/1215	1425	1570	520	470	
	VA5D	1360	1620	1870	2000	-	620	
	VA5R	1480	1740	1980	2110	-	620	
	PSA6R	1315	1575	1815	1945	-	476	
	PSA7R	1745	2005	2245	2375	-	580	
	VP5	1000	1260	1500	1630	-	345	
	VP6	1210	1470	1710	1840	-	445	
	VP7	1290	1550	1790	1920	-	545	
8	HA4D, R	1090	1350	1580	1710	520	470	220
	VA5D	1475	1740	2025	2155	-	620	
	VA5R	1585	1850	2145	2275	-	620	
	PSA6R	1735	2000	2295	2425	-	476	
	PSA7R	2165	2430	2725	2855	-	580	
	VP5	1165	1425	1665	1795	-	345	
	VP6	1375	1635	1875	2005	-	445	
	VP7	1455	1715	1955	2085	-	545	

Note) 1) "H" dimensions are applicable when a hand wheel is not provided. When a top mounted hand wheel HA or VA actuators or side mounted hand wheel PSA6R or VP actuators are used, add the hand wheel dimensions designated in respective specification sheets (No.SS2-8213-0500 for Type HA actuators; No.SS2-8210-0100 and No.SS2-8210-0400 for Type VA actuators; No.SS2-PSA100-0100 for Type VP, PSA actuators).

2) "H" dimensions of Extended bonnet Type 1 are as follows: Top rows for JIS 10K and ANSI 150, and bottom rows for JIS 16K and ANSI 300 or over.

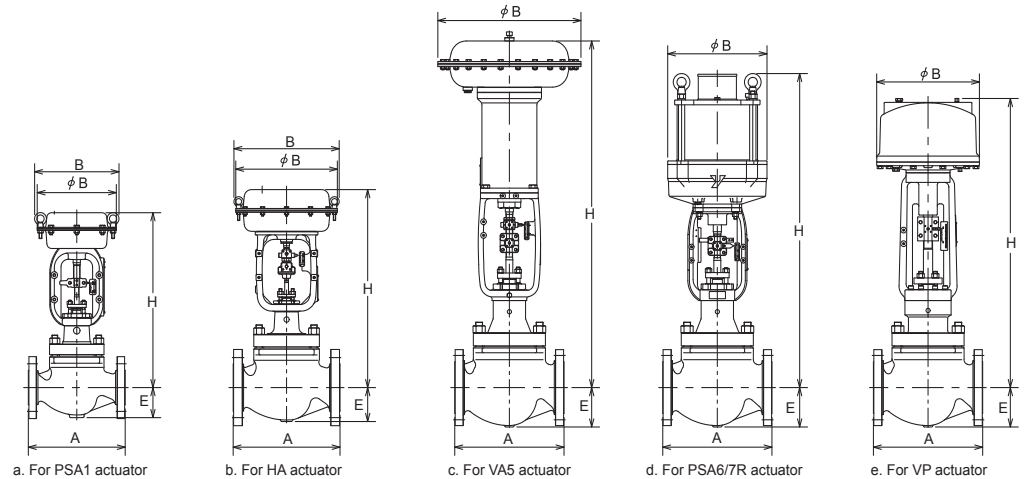


Figure 2. Face-to-face and external dimensions

Table 17 Weight

(Unit: kg)

Nominal size (inches)	Actuator Model No.	Weight															
		Flange type JIS 10K, ANSI/JPI 150				Flange type JIS 16K, 20K, 30K, ANSI/JPI 300				Flange type JIS 40K, ANSI/JPI1600				Weld type JIS10K, 16K, 20K, 30K,40K ANSI/JPI 150, 300, 600			
		Plain bonnet	Extension bonnet Type 1	Extension bonnet Type 2		Plain bonnet	Extension bonnet Type 1	Extension bonnet Type 2		Plain bonnet	Extension bonnet Type 1	Extension bonnet Type 2		Plain bonnet	Extension bonnet Type 1	Extension bonnet Type 2	
				Integral cast type	Welded type			Integral cast type	Welded type			Integral cast type	Welded type			Integral cast type	Welded type
1 ½	PSA1D,R	24	27	30	32	29	32	35	37	37	40	43	45	29	32	35	37
	HA2D,R	31	34	37	39	36	39	42	44	44	47	50	52	36	39	42	44
	HA3D,R	43	46	49	51	48	51	54	56	56	59	62	64	48	51	54	56
2	PSA1D,R	30	33	36	38	35	38	41	43	40	43	46	48	35	38	41	43
	HA2D,R	37	40	43	45	42	45	48	50	47	50	53	55	42	45	48	50
	HA3D,R	49	52	55	57	54	57	60	62	59	62	65	67	54	57	60	62
2 ½	HA2R,R	43	47	51	53	48	52	56	58	65	69	73	75	48	52	56	58
	HA3D,R	55	59	63	65	60	64	68	70	77	81	85	87	60	64	68	70
	HA4D,R	86	90	94	96	91	95	99	101	108	112	116	118	91	95	99	101
3	HA2R,R	53	59	65	68	63	69	75	78	85	91	97	100	63	69	75	78
	HA3D,R	65	71	77	80	75	81	87	90	97	103	109	112	75	81	87	90
	HA4D,R	96	102	108	111	106	112	118	121	128	134	140	143	106	112	118	121
4	HA2R,R	63	73	78	81	78	88	93	96	113	123	128	131	75	85	90	93
	HA3D,R	75	85	90	93	90	100	105	108	125	135	140	143	87	97	102	105
	HA4D,R	106	116	121	124	121	131	136	139	156	166	171	174	118	128	133	136
	VA5D	208	218	223	226	223	233	238	241	258	268	273	276	220	230	235	238
	VA5R	233	243	248	251	248	258	263	266	283	293	298	301	245	255	260	263
	PSA6R	218	223	228	231	228	238	243	246	258	273	278	281	225	235	240	243
	VP5	123	133	138	141	138	148	153	156	173	183	188	191	135	145	150	153
6	HA3D,R	157	172	179	182	187	202	209	212	237	252	259	262	177	192	199	202
	HA4D,R	188	203	210	213	218	233	240	243	268	283	290	293	208	223	230	233
	VA5D	290	305	312	315	320	335	342	345	370	385	392	395	310	325	332	335
	VA5R	315	330	337	340	345	360	367	370	395	410	417	420	335	350	357	360
	PSA6R	295	310	317	320	325	340	347	350	375	390	397	400	315	330	337	340
	PSA7R	580	595	602	605	610	625	632	635	660	675	682	685	600	615	622	625
	VP5	205	220	227	230	235	250	257	260	285	300	307	310	225	240	247	250
	VP6	280	295	302	305	310	325	332	335	360	375	382	385	300	315	322	325
	VP7	390	405	412	415	420	435	442	445	470	485	492	495	410	425	432	435
8	HA4D,R	268	288	298	303	318	338	348	353	438	458	468	473	308	328	338	343
	VA5D	370	390	400	405	420	440	450	455	540	560	570	575	410	430	440	445
	VA5R	395	415	425	430	445	465	475	480	565	585	595	600	435	455	465	470
	PSA6R	420	440	450	455	470	490	500	505	590	610	620	625	460	480	490	495
	PSA7R	705	725	735	740	755	775	785	790	875	895	905	910	745	765	775	780
	VP5	285	305	315	320	335	355	365	370	455	475	485	490	325	345	355	360
	VP6	360	380	390	395	410	430	440	445	530	550	560	565	400	420	430	435
	VP7	470	490	500	505	520	540	550	555	640	660	670	675	510	530	540	545

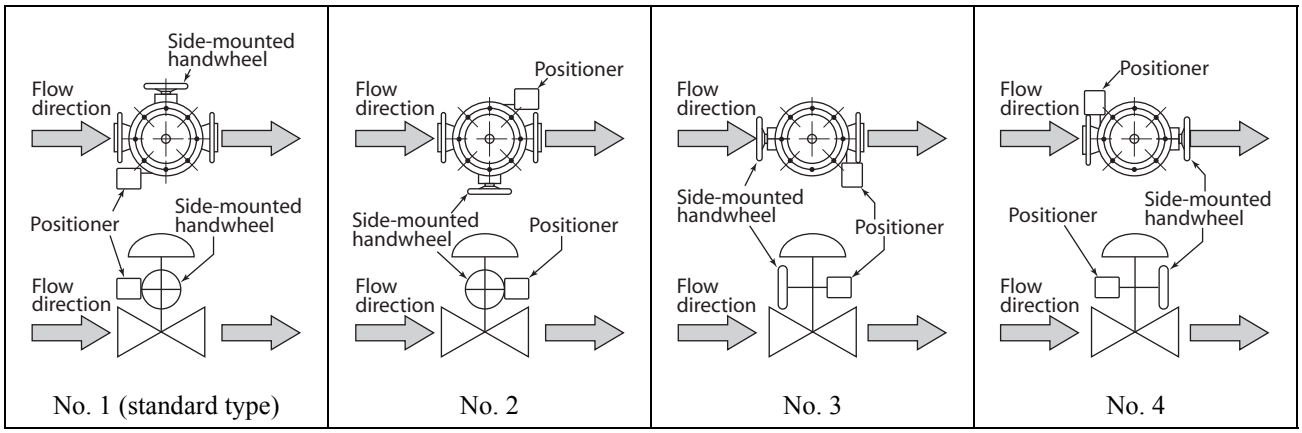


Figure 3 Actuator orientation

Note) 1) Indicate by position number when installation other then the standard type is required.
2) With type PSA6R and Type VP actuators, the side-mounted hand wheel are mounted on the same side as the positioners.

Ordering information

When ordering, please specify;

1) Model Number: HSC
2) Nominal size × Cv required
3) Type and rating of end connections
4) Body and trim material
5) Type of bonnet
6) Valve and plug characteristics
7) Type of actuator, necessity of manual hand wheel, air pressure to diaphragm
8) Valve action (direct or reverse)
9) Accessories (pressure regulator with filter and etc.)
10) Special requirement of oil/water free treatment, copper free treatment, 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

Note

Note

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