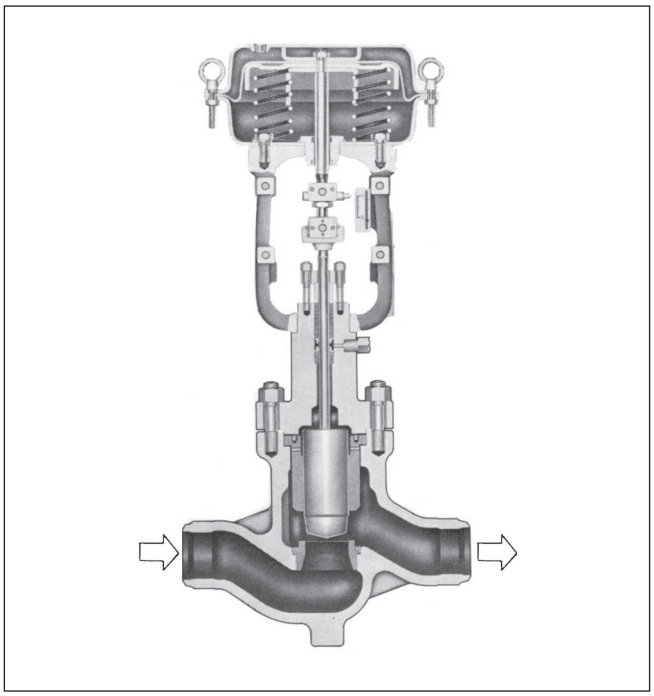
Top-Guided High-Pressure Single Seated Control Valves

Model HPS_ _ _

OVERVIEW

Model HPS Top-Guided High-Pressure Single Seated Control Valves are design for high temperature, high pressure services. The compact valve body, having a S-shade 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 shut-off performance complies with the ANSI Standard.
The actuator integrated with simplest mechanisms utilizes a compact yet powerful diaphragm actuator loaded with multiple springs.
The HPS Valves are widely applicable for reliable control of high temperature, high pressure process lines.
Model HPS is compliant to Functional Safety Standard (IEC61508).



SPECIFICATIONS

Body

Type: Straight through, cast globe valve

Nominal size: 1, 1-1/2, 2, 3 inches

Pressure rating and End connection

Connection type	Pressure rating	Applicable standard
RF	JIS63K	JIS B2210-1984
	ANSI Class 900, 1500, 2500	ANSI B16.5-1981
	JPI Class 900, 1500, 2500	JPI-7S-15-1993
RJ	ANSI Class 900, 1500, 2500	ANSI B16.5-1981
	JPI Class 900, 1500, 2500	JPI-7S-15-1993

Welded end; SW (1 to 3 inches), BW (3 inches)

Material

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

Bonnet: Plain bonnet (-5 to +230 °C)
Extension bonnet Type 1 (230 to 566 °C)

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

Gland type: Bolted gland

Grease

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

Trim

Valve plug

-Metal seat
Single seated, Contoured-type plug
Equal percentage (%C), Linear (LC)

Material

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

Actuator

Type

Motor type	Actuator type
Single acting diaphragm actuator	HA_ _ or VA5_
Spring type piston actuator	PSA6R
Double acting piston actuator	DAP_ _ _

Action: Direct or reverse action

Diaphragm

Actuator model	Diaphragm
HA_ _	Cloth embedded ethylene propylene rubber
VA5_	Cloth embedded chloroprene rubber

Spring range

Actuator model	Spring range
HA_ _ or VA5_	20 to 98 kPa {0.2 to 1.0 kgf/cm²} 40 to 200 kPa {0.4to 2.0 kgf/cm²} 80 to 240 kPa {0.8 to 2.4 kgf/cm²}
PSA6R	200 to 255 kPa {2.0 to 2.6 kgf/cm²} 200 to 295 kPa {2.0 to 3.0 kgf/cm²} 200 to 340 kPa {2.0 to 3.5 kgf/cm²}

Supply pressure

Actuator model	Supply pressure
HA_ _	250 to 390 kPa {2.6 to 4.0 kgf/cm²}
VA5_	250 to 270 kPa {2.6 to 2.8 kgf/cm²}
PSA6R	300 to 400 kPa {3.0 to 4.0 kgf/cm²}
DAP_ _ _	490 kPa {5.0 kgf/cm²}

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

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

Note) With type VA or DAP, Rc1/4 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) For the optional items, refer to the specification sheets and installation drawings of respective accessaries.

<table>
<tr><th rowspan="2">Actuator</th><th colspan="2">Positioner</th><th colspan="2">Hand wheel</th></tr>
<tr><th>P/P</th><th>I/P</th><th>Top</th><th>Side</th></tr>
<tr><td>HA_ _</td><td rowspan="2">HTP-_ _</td><td rowspan="4">AVP7_ _
AVP3_ _
AVP2_ _</td><td rowspan="2">Mounted</td><td rowspan="3">Mounted</td></tr>
<tr><td>VA5 _</td></tr>
<tr><td>PSA6</td><td>HTP-_ _
VPP_ _</td><td rowspan="2">-</td></tr>
<tr><td>DAP560
DAP1000
DAP1500</td><td>VPP_ _</td><td>Mounted
(Hydraulic)</td></tr>
</table>

Additional specification (by special order)

- Special inspection

Flow characteristics inspection, material inspection (Material certificate), non-destructive inspection, steam inspection.

- Cage guide type
- With drain plug
- Double gland
- Oil/Water free treatment
- Copper free treatment
- Stainless steel (SUS304) atmosphere-exposed nuts and bolts
- Special air piping and joint
- Sand-/dust-preventive measures
- Saline damage countermeasures
- Cold-area use specifications
- Tropical-area use specification

Functional Safety Standard (IEC61508) conformity:

SIL3 capable - certified by exida Consulting LLC
The SIL Certificate is valid with the combination of Model PSA, HA, or VA Spring return Actuators.

Performance

Rated Cv value: Refer to Table 2.

Flow characteristics: Refer to Figure 1.

Inherent rangeability:

Refer to Table 2.
(Rangeability 75 : 1 is available as option for rated Cv larger than 1.0)

Allowable differential pressure

Refer to Table 6 to Table 14

Leakage specification

<Metal seat>
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: Within 1% F.S.

Linearity: With positioner: Within ±1% F.S.

Dimensions: Refer to Figure 3, Table 15 and Table 16.

Weight: Refer to Table 17.

Actuator orientation: Refer to Figure 4.

Finish

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

Table 1. Body and trim metal combinations and operating temperature range (°C)

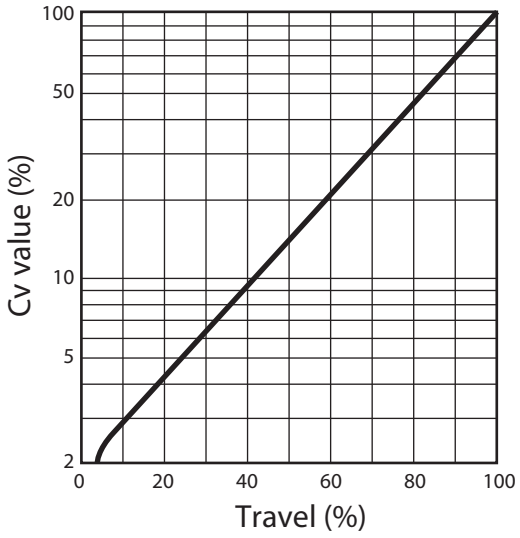
Body material / Trim material								
JIS	body	SCPH 2	SCPH 21	SCPH 32	SCPH 61	SCS 13A	SCS 14A
	bonnet	SFVC2A	SFVCF11A	SFVAF22B	SFVAF5B	SUSF304	SUSF316
ASTM	body	A216 WCB	A217 WC6	A217 WC9	A217 C5	A351 CF8	A351CF8M *1
	bonnet	A105	A182F11	A182F22	A182F5	A182F304	A182F316
Valve plug	Seat ring / Guide ring	-5 to +425	-5 to +425	-5 to +425	-5 to +425	-	-
SUS 440C	SUS 440C						
SUS 304 CoCr-A	SUS 304 CoCr-A	-5 to +425	-5 to +550	-5 to +566	-5 to +566	-5 to +550	-5 to +550 *1
SUS 304 CoCr-A face	SUS 304 CoCr-A					-5 to +550	
SUS 316 CoCr-A	SUS 316 CoCr-A						-5 to +550 *1
SUS 316 CoCr-A face	SUS 316 CoCr-A						-5 to +550 *1

Note) 1. " ▭ " shows standard combination of valve body and trim materials.

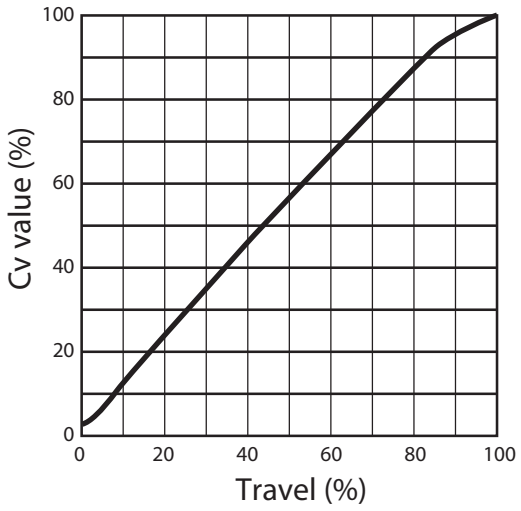
*2. *1 : For ASTM A351 CF8M, the maximum temperature can be +566°C*

Table 2. Cv value and travel

Nominal size (inch)		1									1-1/2			2			3		
		Cv value									Port size (inch)								
		0.25	0.4	0.63	1.0	1.6	2.5	4.0	6.3	12	1	1-1/4	1-1/2	1-1/4	1-1/2	2	2	1-1/2	3
Rated Cv value Equal percentage (%C) Linear (LC)	JIS63K ANSI 900 ANSI1500 JPI900, JPI1500	0.25	0.4	0.63	1	1.6	2.5	4	6.3	12	12	17	25	17	25	47	47	75	110
	ANSI2500 JPI2500	0.25	0.4	0.63	1.0	1.6	2.5	4.0	6.3	12	-	12	17	12	17	31	31	47	75
Inherent rangeability		20:1		30:1	50:1														
Rated travel (mm)		14.3			25												38		



a. Equal percentage characteristics (%C)



b. Linear characteristics (LC)

Figure 1. Flow characteristics

Note) The above graphs indicate typical flow characteristics.

Structural drawing of trim and body material combinations

Following table shows typical body and trim material combinations.
Please contact us about materials that are not listed in this table.

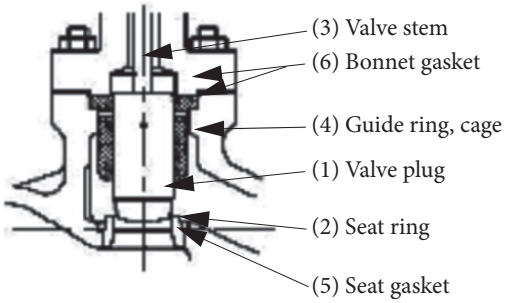


Figure 2. Structural drawing of trim

Table 3. The valve body material is carbon steel (SCPH2/A216WCB).

(1) Valve plug (2) Seat ring	SUS440C	SUS316 CoCr-A SUS316 CoCr-A face		SUS304 CoCr-A SUS304 CoCr-A face	
	General	General	Oil-free	General	Oil-free
(3) Valve stem	SUS316				
(4) Guide ring, cage	SUS440C	SUS316 CoCr-A		SUS304 CoCr-A	
(5) Seat gasket	Nickel-Copper Alloy	Nickel-Copper Alloy	SUS316(PTFE coating)	Nickel-Copper Alloy	SUS316(PTFE coating)
(6) Bonnet gasket	SUS316	SUS316	SUS316(PTFE coating)	SUS316	SUS316(PTFE coating)

Table 4. The valve body material is stainless steel (SCS13A/A351CF8)

(1) Valve plug (2) Seat ring	SUS316 CoCr-A SUS316 CoCr-A face		SUS304 CoCr-A SUS304 CoCr-A face	
	General	Oil-free	General	Oil-free
(3) Valve stem	SUS316			
(4) Guide ring, cage	SUS316 CoCr-A		SUS304 CoCr-A	
(5) Seat gasket	Nickel-Copper Alloy	SUS316(PTFE coating)	Nickel-Copper Alloy	SUS316(PTFE coating)
(6) Bonnet gasket	SUS316	SUS316(PTFE coating)	SUS316	SUS316(PTFE coating)

Table 5. The valve body material is stainless steel (SCS14A/A351CF8M)

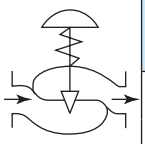
(1) Valve plug (2) Seat ring	SUS316 CoCr-A SUS316 CoCr-A face	
	General	Oil-free
(3) Valve stem	SUS316	
(4) Guide ring, cage	SUS316 CoCr-A	
(5) Seat gasket	Nickel-Copper Alloy	SUS316(PTFE coating)
(6) Bonnet gasket	SUS316	SUS316(PTFE coating)

Allowable differential pressure

Contoured-type metal seat (%C, LC) : Graphite packing "P6610CH+P6528" (-5 to +500 °C)

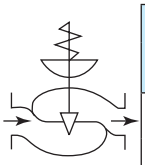
Valves with type HA or VA actuator

Table 6. Air-to-close



Rating	Actuator Model	Supply pressure kPa {kgf/cm²}	Spring Range kPa {kgf/cm²}	Differential Pressure (by Port size(inch)) kPa {kgf/cm²}							
				Cv2.5, 4.0	Cv6.3	Cv12	1-1/4 inch	1-1/2 inch	2 inches	2-1/2 inches	3 inches
JIS 63K ANSI 900, 1500 JPI 900, 1500	HA3D	340 {3.5}	80 to 240 {0.8 to 2.4}	21700 {221}	16600 {169}	10600 {108}	5440 {55.4}	3690 {37.6}	2200 {22.4}	1360 {13.8}	980 {9.9}
				207000 {211}	15600 {159}	9670 {98.6}	4640 {47.3}	3090 {31.5}	1700 {17.3}	960 {9.7}	680 {6.9}
		390 {4.0}		—	—	19400 {197}	9910 {101}	6720 {68.5}	4010 {40.8}	2470 {25.1}	1780 {18.1}
				—	—	18400 {187}	9110 {92.8}	6120 {62.4}	3510 {35.7}	2070 {21.1}	1480 {15.0}
	HA4D	340 {3.5}	80 to 240 {0.8 to 2.4}	—	—	20500 {209}	10400 {106}	7090 {72.2}	4230 {43.1}	2610 {26.6}	1880 {19.1}
				—	—	19500 {198}	9660 {98.5}	6490 {66.1}	3730 {38.0}	2210 {22.5}	1580 {16.1}
		390 {4.0}		—	—	25900 {264}	18100 {184}	12300 {125}	7360 {75.0}	4540 {46.2}	3270 {33.3}
				—	—	25900 {264}	17300 {176}	11700 {119}	6860 {69.0}	4140 {42.0}	2970 {30.2}
	VA5D	270 {2.8}	40 to 200 {0.4 to 2.0}	—	—	—	6500 {66.2}	4400 {44.8}	2650 {27.0}	1630 {16.6}	1170 {11.9}
				—	—	—	5700 {58.0}	3800 {38.0}	2150 {21.0}	1230 {12.0}	870 {8.0}
ANSI 2500 JPI 2500	HA3D	340 {3.5}	80 to 240 {0.8 to 2.4}	21700 {221}	16600 {169}	10600 {108}	10600 {108}	5440 {55.4}	2950 {30.0}	2200 {22.4}	1360 {13.8}
				20700 {211}	15600 {159}	9670 {98.6}	9670 {98.6}	4840 {49.3}	2450 {24.9}	1800 {18.3}	1060 {10.8}
		390 {4.0}		39600 {403}	30300 {308}	19400 {197}	19400 {197}	9910 {101}	5380 {54.8}	4010 {40.8}	2470 {25.1}
				38600 {393}	29300 {298}	18400 {187}	18400 {187}	9310 {94.9}	4880 {49.7}	3610 {36.8}	2170 {22.1}
	HA4D	340 {3.5}	80 to 240 {0.8 to 2.4}	—	—	20500 {209}	20500 {209}	10400 {106}	5680 {57.9}	4230 {43.1}	2610 {26.6}
				—	—	19500 {198}	19500 {198}	9860 {100}	5180 {52.8}	3830 {39.0}	2310 {23.5}
		390 {4.0}		—	—	35600 {363}	35600 {363}	18100 {184}	9870 {100}	7360 {75.0}	4540 {46.2}
				—	—	34600 {352}	34600 {352}	17500 {178}	9370 {95.5}	6960 {70.9}	4240 {43.2}
	VA5D	270 {2.8}	40 to 200 {0.4 to 2.0}	—	—	—	—	6540 {66.6}	3550 {36.1}	2650 {27.0}	1630 {16.6}
				—	—	—	—	5940 {60.5}	3050 {31.1}	2250 {22.9}	1330 {13.5}

Table 7. Air-to-open



Rating	Actuator Model	Supply pressure kPa {kgf/cm²}	Spring Range kPa {kgf/cm²}	Differential Pressure (by Port size(inch)) kPa {kgf/cm²}							
				Cv2.5, 4.0	Cv6.3	Cv12	1-1/4 inch	1-1/2 inch	2 inches	2-1/2 inches	3 inches
JIS 63K ANSI 900, 1500 JPI 900, 1500	HA3R	270 {2.8}	80 to 240 {0.8 to 2.4}	14600 {148}	11200 {114}	7170 {73.1}	3660 {37.3}	2480 {25.2}	1480 {15.0}	910 {9.2}	650 {6.6}
				13600 {138}	10200 {104}	6170 {62.9}	2860 {29.0}	1880 {19.0}	980 {9.9}	510 {5.2}	350 {3.5}
	HA4R	270 {2.8}		18300 {186}	18100 {184}	14400 {146}	7370 {75.1}	5000 {50.9}	2980 {30.3}	1840 {18.7}	1320 {13.4}
				17300 {176}	17100 {174}	13400 {136}	6570 {66.9}	4400 {44.8}	2480 {25.0}	1440 {14.6}	1020 {10.4}
	VA5R	270 {2.8}		—	—	—	7930 {80.8}	5370 {54.7}	3210 {32.7}	1980 {20.0}	1420 {14.4}
				—	—	—	7130 {72.7}	4770 {48.6}	2710 {27.6}	1580 {16.0}	1120 {11.4}
	PSA6R	400 {4.0}	200 to 340 {2.0 TO 3.5}	—	—	—	—	17100 {174.0}	10000 {101.9}	6080 {61.9}	4310 {43.9}
				—	—	—	—	16500 {168.0}	9500 {96.8}	5680 {57.9}	4010 {40.8}
ANSI 2500 JPI 2500	HA3R	270 {2.8}	80 to 240 {0.8 to 2.4}	14600 {148}	11200 {114}	7170 {73.0}	7170 {73.0}	3660 {37.3}	1980 {20.0}	1480 {15.0}	910 {9.2}
				13600 {138}	10200 {104}	6170 {62.9}	6170 {62.9}	3060 {31.2}	1480 {15.0}	1080 {11.0}	610 {6.2}
	HA4R	270 {2.8}		18300 {186}	18100 {184}	14400 {146}	14400 {146}	7370 {75.0}	4000 {40.7}	2980 {30.3}	1840 {18.7}
				17300 {176}	17100 {174}	13400 {136}	13400 {136}	6770 {69.0}	3500 {35.6}	2580 {26.3}	1540 {15.7}
	VA5R	270 {2.8}		—	—	—	—	7930 {80.8}	4300 {43.8}	3210 {32.6}	1980 {20.0}
				—	—	—	—	7330 {74.7}	3800 {38.7}	2810 {28.6}	1670 {17.0}
	PSA6R	400 {4.0}	200 to 340 {2.0 TO 3.5}	—	—	—	—	25300 {257}	13500 {137}	10000 {101}	6080 {61.9}
				—	—	—	—	24600 {250}	13000 {132}	9600 {97.8}	5780 {58.9}

Note) 1. Positioner is employed in general.

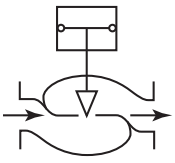
2. Take care not to cause the maximum allowable differential pressure to exceed the maximum operating pressure designated by ANSI B16.34-1981 or JIS B2201-1984.

3. Take care not to cause the inlet pressure (P1) to exceed allowable differential pressure at valve-close.

4. Allowable differential pressure limit differs depending on valve seat leakage volume. Figures in the upper portion of the column denote pressure under a leakage rate of 0.01%. Those on the lower side denote pressure under a leakage rate of 0.001%.

Valves with type DAP actuator

Table 8. Air-to-close and Air-to-open



Rating	Actuator Model	Supply pressure kPa {kgf/cm²}	Differential Pressure (by Port size(inch)) kPa {kgf/cm²}							
			Cv2.5, 4.0	Cv6.3	Cv12	1-1/4 inch	1-1/2 inch	2 inches	2-1/2 inches	3 inches
JIS 63K ANSI 900, 1500 JPI 900, 1500	DAP 560	490 {5.0}	25900 {264.0}	25900 {264.0}	25900 {264.0}	25900 {264.0}	21800 {222.0}	13000 {132.0}	8070 {82.2}	5810 {59.2}
			25900 {264.0}	25900 {264.0}	25900 {264.0}	25900 {264.0}	21200 {216.0}	12500 {127.0}	7670 {78.2}	5510 {56.1}
	DAP 1000		—	—	—	—	25900 {264.0}	22100 {225.0}	13600 {138.0}	9850 {100.0}
			—	—	—	—	25900 {264.0}	21600 {220.0}	13200 {134.0}	9550 {97.3}
	DAP 1500		—	—	—	—	—	25900 {264.0}	21000 {214.0}	15100 {153.0}
			—	—	—	—	—	25900 {264.0}	20600 {210.0}	14800 {150.0}
ANSI 2500 JPI 2500	DAP 560		30900 {315.0}	30800 {314.0}	30700 {313.0}	30700 {313.0}	30400 {309.0}	17500 {178.0}	13000 {132.0}	8070 {82.2}
			29900 {304.0}	29800 {303.0}	29700 {302.0}	29900 {304.0}	29800 {303.0}	17000 {173.0}	12600 {128.0}	7770 {79.2}
	DAP 1000		—	—	—	—	—	29400 {299.0}	22100 {225.0}	13600 {138.0}
			—	—	—	—	—	28900 {294.0}	21700 {221.0}	13300 {135.0}
	DAP 1500		—	—	—	—	—	—	28800 {293.0}	21000 {214.0}
			—	—	—	—	—	—	28400 {289.0}	20700 {211.0}

Note) 1. Positioner is employed in general.

2. 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).

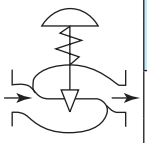
3. Take care not to cause the maximum allowable differential pressure to exceed the maximum operating pressure designated by JIS B 2201-1984 or ANSI B 16.34-1981.

4. Allowable differential pressure limit differs depending on valve seat leakage volume. Figures in the upper portion of the column denote pressure under a leakage rate of 0.01%. Those on the lower side denote pressure under a leakage rate of 0.001%.

Contoured-type metal seat (%C, LC) : Graphite packing "P6610CH+M8590" (+500 to +566 °C)

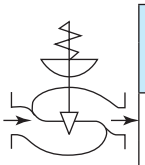
Valves with type HA or VA actuator

Table 9. Air-to-close



Rating	Actuator Mode	Supply pressure kPa {kgf/cm²}	Spring Range kPa {kgf/cm²}	Differential Pressure (by Port size(inch)) kPa {kgf/cm²}							
				Cv2.5, 4.0	Cv6.3	Cv12	1-1/4 inch	1-1/2 inch	2 inches	2-1/2 inches	3 inches
JIS 63K ANSI 900, 1500 JPI 900, 1500	HA3D	340 {3.5}	80 to 240 {0.8 to 2.4}	17500 {178.0}	13400 {136.0}	8570 {87.0}	4370 {44.5}	2960 {30.1}	1770 {18.0}	1090 {11.1}	780 {7.9}
				16500 {168.0}	12400 {126.0}	7570 {77.0}	3570 {36.4}	2360 {24.0}	1270 {12.9}	690 {7.0}	480 {4.8}
		390 {4.0}		—	—	17300 {176.0}	8840 {90.0}	5990 {61.0}	3580 {36.5}	2210 {22.5}	1590 {16.2}
				—	—	16300 {166.0}	8040 {81.9}	5390 {54.9}	3080 {31.4}	1810 {18.4}	1290 {13.1}
	HA4D	340 {3.5}	80 to 240 {0.8 to 2.4}	—	—	17900 {182.0}	9140 {93.2}	6190 {63.1}	3700 {37.7}	2280 {23.2}	1640 {16.7}
				—	—	16900 {172.0}	8340 {85.0}	5590 {57.0}	3200 {32.6}	1880 {19.1}	1340 {13.6}
		390 {4.0}		—	—	25900 {264.0}	16800 {171.0}	11400 {116.0}	6820 {69.5}	4210 {42.9}	3030 {30.8}
				—	—	25900 {264.0}	16000 {163.0}	10800 {110.0}	6320 {64.4}	3810 {38.8}	2730 {27.8}
	VA5D	270 {2.8}	40 to 200 {0.4 to 2.0}	—	—	—	4010 {40.8}	2720 {27.7}	1620 {16.5}	1000 {10.1}	720 {7.3}
				—	—	—	3210 {32.7}	2120 {21.6}	1120 {11.4}	600 {6.1}	420 {4.2}
ANSI 2500 JPI 2500	HA3D	340 {3.5}	80 to 240 {0.8 to 2.4}	17500 {178.0}	13400 {136.0}	8570 {87.0}	8570 {87.0}	4370 {44.5}	2370 {24.1}	1770 {18.0}	1090 {11.1}
				16500 {168.0}	12400 {126.0}	7570 {77.0}	7570 {77.0}	3770 {38.4}	1870 {19.0}	1370 {13.9}	790 {8.0}
		390 {4.0}		35300 {359.0}	27000 {275.0}	17300 {176.0}	17300 {176.0}	8840 {90.0}	4800 {48.9}	3580 {36.5}	2210 {22.5}
				34300 {349.0}	26000 {265.0}	16300 {166.0}	16300 {166.0}	8240 {84.0}	4300 {43.8}	3180 {32.4}	1910 {19.4}
	HA4D	340 {3.5}	80 to 240 {0.8 to 2.4}	—	—	17900 {182.0}	17900 {182.0}	9140 {93.2}	4960 {50.5}	3700 {37.7}	2280 {23.2}
				—	—	16900 {172.0}	16900 {172.0}	8540 {87.0}	4460 {45.4}	3300 {33.6}	1980 {20.1}
		390 {4.0}		—	—	33000 {336.0}	33000 {336.0}	16800 {171.0}	9150 {93.3}	6820 {69.5}	4210 {42.9}
				—	—	32000 {326.0}	32000 {326.0}	16200 {165.0}	8650 {88.2}	6420 {65.4}	3910 {39.8}
	VA5D	270 {2.8}	40 to 200 {0.4 to 2.0}	—	—	—	—	4010 {40.8}	2170 {22.1}	1620 {16.5}	1000 {10.1}
				—	—	—	—	3410 {34.7}	1670 {17.0}	1220 {12.4}	700 {7.1}

Table 10. Air-to-open



Rating	Actuator Model	Supply pressure kPa {kgf/cm²}	Spring Range kPa {kgf/cm²}	Differential Pressure (by Port size(inch)) kPa {kgf/cm²}							
				Cv2.5, 4.0	Cv6.3	Cv12	1-1/4 inch	1-1/2 inch	2 inches	2-1/2 inches	3 inches
JIS 63K ANSI 900, 1500 JPI 900, 1500	HA3R	390 {4.0}	80 to 240 {0.8 to 2.4}	10300 {105.0}	7930 {80.8}	5070 {51.6}	2590 {26.4}	1750 {17.8}	1040 {10.6}	640 {6.5}	460 {4.6}
				9360 {95.4}	6930 {70.6}	4070 {41.5}	1790 {18.2}	1150 {11.7}	540 {5.5}	240 {2.4}	160 {1.6}
	HA4R	390 {4.0}		18300 {186.0}	18100 {184.0}	11800 {120.0}	6050 {61.6}	4100 {41.8}	2450 {24.9}	1510 {15.3}	1080 {11.0}
				17300 {176.0}	17100 {174.0}	10800 {110.0}	5250 {53.5}	3500 {35.6}	1950 {19.8}	1110 {11.3}	780 {7.9}
	VA5R	270 {2.8}	70 to 230 {0.7 to 2.3}	—	—	—	4010 {40.9}	2720 {27.7}	1620 {16.5}	1000 {10.1}	720 {7.3}
				—	—	—	3210 {32.7}	2120 {21.6}	1120 {11.4}	600 {6.1}	420 {4.2}
	PSA6R	400 {4.0}	200 to 340 {2.0 to 3.5}	—	—	—	—	17100 {174.0}	10000 {101.0}	6080 {61.9}	4310 {43.9}
				—	—	—	—	16500 {168.0}	9500 {96.8}	5680 {57.9}	4010 {40.8}
ANSI 2500 JPI 2500	HA3R	390 {4.0}	80 to 240 {0.8 to 2.4}	10300 {105.0}	7930 {80.8}	5070 {51.6}	5070 {51.6}	2590 {26.4}	1400 {14.2}	1040 {10.6}	640 {6.5}
				9360 {95.4}	6930 {70.6}	4070 {41.5}	4070 {41.5}	1990 {20.2}	900 {9.1}	640 {6.5}	340 {3.4}
	HA4R	390 {4.0}		18300 {186.0}	18100 {184.0}	11800 {120.0}	11800 {120.0}	6050 {61.6}	3280 {33.4}	2450 {24.9}	1510 {15.3}
				17300 {176.0}	17100 {174.0}	10800 {110.0}	10800 {110.0}	5450 {55.5}	2780 {28.3}	2050 {20.9}	1210 {12.3}
	VA5R	270 {2.8}	70 to 230 {0.7 to 2.3}	—	—	—	—	4010 {40.8}	2170 {22.1}	1620 {16.5}	1000 {10.1}
				—	—	—	—	3410 {34.7}	1670 {17.0}	1220 {12.4}	690 {7.0}
	PSA6R	400 {4.0}	200 to 340 {2.0 to 3.5}	—	—	—	—	25300 {257.0}	13500 {137.0}	10000 {101.0}	6080 {61.9}
				—	—	—	—	24600 {250.0}	13000 {132.0}	9600 {97.8}	5780 {58.9}

Note) 1. Positioner is employed in general.

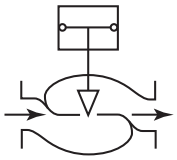
2. Take care not to cause the maximum allowable differential pressure to exceed the maximum operating pressure designated by ANSI B16.34-1981 or JIS B2201-1984.

3. Take care not to cause the inlet pressure (P1) to exceed allowable differential pressure at valve-close.

4. Allowable differential pressure limit differs depending on valve seat leakage volume. Figures in the upper portion of the column denote pressure under a leakage rate of 0.01%. Those on the lower side denote pressure under a leakage rate of 0.001%.

Valves with type DAP actuator

Table 11. Air-to-close and Air-to-open



Rating	Actuator Model	Supply pressure kPa {kgf/cm²}	Differential Pressure (by Port size(inch)) kPa {kgf/cm²}							
			Cv2.5, 4.0	Cv6.3	Cv12	1-1/4 inch	1-1/2 inch	2 inches	2-1/2 inches	3 inches
JIS 63K ANSI 900, 1500 JPI 900, 1500	DAP 560	490 {5.0}	25900 {264.0}	25900 {264.0}	25900 {264.0}	25900 {264.0}	20600 {210.0}	12300 {125.0}	7610 {77.6}	5480 {55.8}
			25900 {264.0}	25900 {264.0}	25900 {264.0}	25900 {264.0}	20000 {203.0}	11800 {120.0}	7210 {73.5}	5180 {52.8}
	DAP 1000		—	—	—	—	25900 {264.0}	20900 {213.0}	12900 {131.0}	9300 {94.8}
			—	—	—	—	25900 {264.0}	20400 {208.0}	12500 {127.0}	9000 {91.7}
	DAP 1500		—	—	—	—	—	25900 {264.0}	19800 {201.0}	14200 {144.0}
			—	—	—	—	—	25900 {264.0}	19400 {197.0}	13900 {141.0}
ANSI 2500 JPI 2500	DAP 560		30900 {315.0}	30800 {314.0}	30700 {313.0}	30700 {313.0}	30400 {309.0}	16500 {168.0}	12300 {125.0}	7610 {77.6}
			29900 {304.0}	29800 {303.0}	29700 {302.0}	29900 {304.0}	29800 {303.0}	16000 {163.0}	11900 {121.0}	7310 {74.5}
	DAP 1000		—	—	—	—	—	28000 {285.0}	20900 {213.0}	12900 {131.0}
			—	—	—	—	—	27500 {280.0}	20500 {209.0}	12600 {128.0}
	DAP 1500		—	—	—	—	—	—	28800 {293.0}	19800 {201.0}
			—	—	—	—	—	—	28400 {289.0}	19500 {198.0}

Note) 1. Positioner is employed in general.

2. 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).

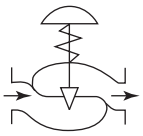
3. Take care not to cause the maximum allowable differential pressure to exceed the maximum operating pressure designated by JIS B 2201-1984 or ANSI B 16.34-1981.

4. Allowable differential pressure limit differs depending on valve seat leakage volume. Figures in the upper portion of the column denote pressure under a leakage rate of 0.01%. Those on the lower side denote pressure under a leakage rate of 0.001%.

Contoured-type metal seat (%C, LC) : PTFE packing

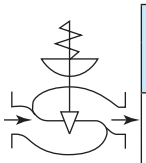
Valves with type HA or VA actuator

Table 12. Air-to-close



Rating	Actuator Model	Supply pressure kPa {kgf/cm²}	Spring Range kPa {kgf/cm²}	Differential Pressure (by Port size(inch)) kPa {kgf/cm²}							
				Cv2.5, 4.0	Cv6.3	Cv12	1-1/4 inch	1-1/2 inch	2 inches	2-1/2 inches	3 inches
JIS 63K ANSI 900, 1500 JPI 900, 1500	HA3D	270 {2.8}	40 to 200 {0.4 to 2.0}	16000 {163.0}	15800 {161.0}	10000 {102.0}	4900 {50.0}	3140 {32.0}	1760 {18.0}	9800 {10.0}	6900 {7.0}
				14900 {152.0}	14600 {149.0}	9020 {92.0}	4120 {42.0}	2650 {27.0}	1370 {14.0}	6900 {7.0}	3900 {4.0}
		290 {3.0}		20300 {207.0}	20100 {205.0}	12700 {130.0}	6280 {64.0}	4120 {42.0}	2350 {24.0}	1370 {14.0}	8800 {9.0}
				19200 {196.0}	18800 {192.0}	11800 {120.0}	5590 {57.0}	3530 {36.0}	1860 {19.0}	9810 {10.0}	5900 {6.0}
		340 {3.5}		25900 {264.0}	25900 {264.0}	19600 {200.0}	9810 {100.0}	6470 {66.0}	3730 {38.0}	2260 {23.0}	1570 {16.0}
				25900 {264.0}	25900 {264.0}	18600 {190.0}	9020 {92.0}	5580 {60.0}	3330 {34.0}	1860 {19.0}	1270 {13.0}
		390 {4.0}		—	—	25900 {264.0}	13200 {135.0}	8920 {91.0}	5200 {53.0}	3140 {32.0}	2160 {22.0}
						25500 {260.0}	12600 {128.0}	8340 {85.0}	4710 {48.0}	2740 {28.0}	1860 {19.0}
	HA4D	270 {2.8}	40 to 200 {0.4 to 2.0}	—	—	17900 {183.0}	8920 {91.0}	5980 {61.0}	3430 {35.0}	2060 {21.0}	1370 {14.0}
						17000 {173.0}	8240 {84.0}	5390 {55.0}	2940 {30.0}	1670 {17.0}	1080 {11.0}
		290 {3.0}		—	—	22600 {231.0}	11400 {116.0}	7550 {77.0}	4410 {45.0}	2650 {27.0}	1860 {19.0}
						21700 {221.0}	10700 {109.0}	6960 {71.0}	3920 {40.0}	2260 {23.0}	1570 {16.0}
		340 {3.5}		—	—	25900 {264.0}	17400 {177.0}	1170 {119.0}	6860 {70.0}	4120 {42.0}	2940 {30.0}
						25900 {264.0}	16700 {170.0}	11100 {113.0}	6370 {65.0}	3820 {39.0}	2650 {27.0}
		390 {4.0}		—	—	—	23400 {239.0}	15800 {161.0}	9320 {95.0}	5690 {58.0}	4020 {41.0}
							22800 {232.0}	15200 {155.0}	8820 {90.0}	5300 {54.0}	3730 {38.0}
	VA5D	260 {2.6}	20 to 98 {0.2 to 1.0}	—	—	—	25800 {263.0}	17400 {177.0}	10200 {104.0}	6180 {63.0}	4410 {45.0}
							25000 {255.0}	16800 {171.0}	9810 {100.0}	5880 {60.0}	4120 {42.0}
		270 {2.8}		—	—	—	25900 {264.0}	19600 {200.0}	11600 {118.0}	7060 {72.0}	5000 {51.0}
							25900 {264.0}	19000 {194.0}	11200 {114.0}	6670 {68.0}	4170 {48.0}
ANSI 2500 JPI 2500	HA3D	270 {2.8}	40 to 200 {0.4 to 2.0}	16000 {163.0}	15800 {161.0}	10000 {102.0}	10000 {102.0}	4900 {50.0}	2450 {25.0}	1760 {18.0}	9800 {10.0}
				14900 {152.0}	14600 {149.0}	9020 {92.0}	9020 {92.0}	4120 {42.0}	1960 {20.0}	1370 {14.0}	6900 {7.0}
		290 {3.0}		20300 {207.0}	20100 {205.0}	12700 {130.0}	12700 {130.0}	6280 {64.0}	3240 {33.0}	2350 {24.0}	1370 {14.0}
				19200 {196.0}	18800 {192.0}	11800 {120.0}	11800 {120.0}	5590 {57.0}	2740 {28.0}	1860 {19.0}	9800 {10.0}
		340 {3.5}		31000 {316.0}	30800 {314.0}	19600 {200.0}	19600 {200.0}	9810 {100.0}	5100 {52.0}	3730 {38.0}	2260 {23.0}
				29900 {305.0}	29500 {301.0}	18600 {190.0}	18600 {190.0}	9020 {92.0}	4610 {47.0}	3330 {34.0}	1860 {19.0}
		390 {4.0}		41700 {425.0}	41500 {423.0}	26500 {270.0}	26500 {270.0}	13200 {135.0}	7060 {72.0}	5200 {53.0}	3140 {32.0}
				40600 {414.0}	40200 {410.0}	25500 {260.0}	25500 {260.0}	12600 {128.0}	6570 {67.0}	4710 {48.0}	2740 {28.0}
	HA4D	270 {2.8}	40 to 200 {0.4 to 2.0}	—	—	17900 {183.0}	17900 {183.0}	8920 {91.0}	4710 {48.0}	3430 {35.0}	2060 {21.0}
						17000 {173.0}	17000 {173.0}	8240 {84.0}	4220 {43.0}	2940 {30.0}	1670 {17.0}
		290 {3.0}		—	—	22700 {231.0}	22700 {231.0}	11400 {116.0}	5980 {61.0}	4410 {45.0}	2650 {27.0}
						21700 {221.0}	21700 {221.0}	10700 {109.0}	5490 {56.0}	3920 {40.0}	2260 {23.0}
		340 {3.5}		—	—	34400 {351.0}	34400 {351.0}	17400 {177.0}	9320 {95.0}	6860 {70.0}	4120 {42.0}
						33400 {341.0}	33400 {341.0}	16700 {170.0}	8730 {89.0}	6370 {65.0}	3820 {39.0}
		390 {4.0}		—	—	43100 {440.0}	43100 {440.0}	23400 {239.0}	12600 {128.0}	9320 {95.0}	5690 {58.0}
						43100 {440.0}	43100 {440.0}	22800 {232.0}	12100 {123.0}	8820 {90.0}	5300 {54.0}
	VA5D	260 {2.6}	20 to 98 {0.2 to 1.0}	—	—	—	—	25800 {263.0}	13800 {141.0}	10200 {104.0}	6180 {63.0}
								25000 {255.0}	13300 {136.0}	9810 {100.0}	5880 {60.0}
		270 {2.8}		—	—	—	—	29000 {296.0}	15600 {159.0}	11600 {118.0}	7060 {72.0}
								28300 {289.0}	15100 {154.0}	11200 {114.0}	6670 {68.0}

Table 13. Air-to-open



Rating	Actuator Model	Supply pressure kPa {kgf/cm²}	Spring Range kPa {kgf/cm²}	Differential Pressure (by Port size(inch)) kPa {kgf/cm²}							
				Cv2.5, 4.0	Cv6.3	Cv12	1-1/4 inch	1-1/2 inch	2 inches	2-1/2 inches	3 inches
JIS63K ANSI 900, 1500 JPI 900, 1500	HA3R	260 - 390 {2.6 - 4.0} *4	80 to 240 {0.8 to 2.4}	16000 {163.0}	15800 {161.0}	10000 {102.0}	4900 {50.0}	3140 {32.0}	1760 {18.0}	9800 {10.0}	6900 {7.0}
				14900 {152.0}	14600 {149.0}	9020 {92.0}	4120 {42.0}	2650 {27.0}	1370 {14.0}	6900 {7.0}	3900 {4.0}
	HA4R		80 to 240 {0.8 to 2.4}	18300 {187.0}	18100 {185.0}	17900 {183.0}	8920 {91.0}	5980 {61.0}	3430 {35.0}	2060 {21.0}	1370 {14.0}
				17600 {180.0}	17400 {177.0}	17000 {173.0}	8240 {84.0}	5390 {55.0}	2940 {30.0}	1670 {17.0}	1080 {11.0}
	VA5R	250 - 270 {2.5 - 2.8} *4	80 to 240 {0.8 to 2.4}	—	—	—	12400 {127.0}	8340 {85.0}	4900 {50.0}	2940 {30.0}	2060 {21.0}
							11800 {120.0}	7750 {79.0}	4410 {45.0}	2550 {26.0}	1760 {18.0}
	PSA6R	300 {3.0}*1	200 to 255 {2.0 to 2.6}	25900 {264.0}	25900 {264.0}	25900 {264.0}	25300 {258.0}	17100 {174.0}	10000 {102.0}	6080 {62.0}	4310 {44.0}
		350 {3.5}*2	200 to 295 {2.0 to 3.0}	25900 {264.0}	25900 {264.0}	25900 {264.0}	24600 {251.0}	16500 {168.0}	9610 {98.0}	5780 {59.0}	4020 {41.0}
		400 {4.0}*3	200 to 340 {2.0 to 3.5}								
ANSI 2500 JPI 2500	HA3R	260 - 390 {2.6 - 4.0} *4	80 to 240 {0.8 to 2.4}	16000 {163.0}	15800 {161.0}	10000 {102.0}	10000 {102.0}	4900 {50.0}	2450 {25.0}	1760 {18.0}	9800 {10.0}
				14900 {152.0}	14600 {149.0}	9020 {92.0}	9020 {92.0}	4120 {42.0}	1960 {20.0}	1370 {14.0}	6900 {7.0}
	HA4R		80 to 240 {0.8 to 2.4}	18300 {187.0}	18100 {185.0}	17900 {183.0}	17900 {183.0}	8900 {91.0}	4710 {48.0}	3430 {35.0}	2060 {21.0}
				17600 {180.0}	17400 {177.0}	17000 {173.0}	17000 {173.0}	8200 {84.0}	4220 {43.0}	2940 {30.0}	1670 {17.0}
	VA5R	260 - 270 {2.6 - 2.8} *4	80 to 240 {0.8 to 2.4}	—	—	—	—	12400 {127.0}	6670 {68.0}	4900 {50.0}	2940 {30.0}
								11800 {120.0}	6080 {62.0}	4410 {45.0}	2550 {26.0}
	PSA6R	300 {3.0}*1	200 to 255 {2.0 to 2.6}	32300 {329.0}	32200 {328.0}	32100 {327.0}	32100 {327.0}	25300 {258.0}	13500 {138.0}	10000 {102.0}	6080 {62.0}
		350 {3.5}*2	200 to 295 {2.0 to 3.0}	31900 {325.0}	31700 {323.0}	31400 {320.0}	31400 {320.0}	24600 {251.0}	13000 {133.0}	7650 {78.0}	5780 {59.0}
		400 {4.0}*3	200 to 340 {2.0 to 3.5}								

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

2. Positioner is employed in general.

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. Take care not to cause the inlet pressure (P1) to exceed allowable differential pressure at valve-close.

5. Allowable differential pressure limit differs depending on valve seat leakage volume. Figures in the upper portion of the column denote pressure under a leakage rate of 0.01%. Those on the lower side denote pressure under a leakage rate of 0.001%.

*6. *1 is applicable to valve size 1 inch; Cv value 0.25 to 0.63.*

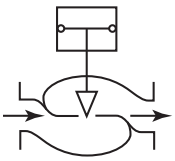
**2 is applicable to valve size 1 inch; Cv value 1.0 to 12, size 1-1/2 to 2 inches.*

**3 is applicable to valve size 3 inches.*

**4 Supply pressure is configurable. Please specify the supply pressure.*

Valves with type DAP actuator

Table 14. Air-to-close and Air-to-open



Rating	Actuator Model	Supply pressure kPa {kgf/cm²}	Differential Pressure (by Port size(inch)) kPa {kgf/cm²}							
			Cv2.5, 4.0	Cv6.3	Cv12	1-1/4 inch	1-1/2 inch	2 inches	2-1/2 inches	3 inches
JIS 63K ANSI 900, 1500 JPI 900, 1500	DAP 560	290 {3.0}	18400 {188.0}	18300 {187.0}	18200 {186.0}	18000 {184.0}	13900 {142.0}	8140 {83.0}	4900 {50.0}	3530 {36.0}
			18100 {185.0}	18000 {184.0}	17800 {182.0}	17400 {177.0}	13300 {136.0}	7750 {79.0}	4610 {47.0}	3240 {33.0}
		390 {4.0}	24600 {251.0}	24600 {251.0}	24500 {250.0}	24200 {247.0}	18700 {191.0}	11100 {113.0}	6770 {69.0}	4800 {49.0}
			24300 {248.0}	24200 {247.0}	24000 {245.0}	23600 {241.0}	18100 {185.0}	10600 {108.0}	6370 {65.0}	4510 {46.0}
		490 {5.0}	25900 {264.0}	25900 {264.0}	25900 {264.0}	25900 {264.0}	23500 {240.0}	13900 {142.0}	8530 {87.0}	6080 {62.0}
			25900 {264.0}	25900 {264.0}	25900 {264.0}	25900 {264.0}	22900 {234.0}	13500 {138.0}	8140 {83.0}	5780 {59.0}
	DAP 1000	290 {3.0}	—	—	—	—	17600 {179.0}	14300 {146.0}	8730 {89.0}	6280 {64.0}
							17200 {175.0}	13900 {142.0}	8430 {86.0}	5980 {61.0}
		390 {4.0}	—	—	—	—	23500 {240.0}	19300 {197.0}	11900 {121.0}	8430 {86.0}
							23100 {236.0}	18800 {192.0}	11500 {117.0}	8140 {83.0}
		490 {5.0}	—	—	—	—	25900 {264.0}	24300 {248.0}	14900 {152.0}	10700 {109.0}
							25900 {264.0}	23800 {243.0}	14500 {148.0}	10400 {106.0}
	DAP 1500	290 {3.0}	—	—	—	—	—	17200 {175.0}	13500 {138.0}	9710 {99.0}
								16800 {171.0}	13200 {135.0}	9410 {96.0}
		390 {4.0}	—	—	—	—	—	22900 {234.0}	18200 {186.0}	1300 {133.0}
								22600 {231.0}	17800 {182.0}	12700 {130.0}
		490 {5.0}	—	—	—	—	—	25900 {264.0}	22800 {233.0}	16400 {167.0}
								25900 {264.0}	22400 {229.0}	16100 {164.0}
ANSI 2500 JPI 2500	DAP 560	290 {3.0}	18400 {188}	18300 {187}	18200 {186}	18200 {186}	18000 {184}	11100 {113}	8140 {83.0}	4900 {50.0}
			18100 {185}	18000 {184}	17800 {182}	17800 {182}	17400 {177}	10500 {107}	7750 {79.0}	4610 {47.0}
		390 {4.0}	24600 {251}	24600 {251}	24500 {250}	24500 {250}	24200 {247}	14900 {152}	1110 {113.0}	6770 {69.0}
			24300 {248}	24200 {247}	24000 {245}	24000 {245}	23600 {241}	14400 {147}	10600 {108.0}	6370 {65.0}
		490 {5.0}	30900 {315}	30800 {314}	30700 {313}	30700 {313}	30400 {310}	18800 {192}	13900 {142.0}	8530 {87.0}
			30600 {312}	30500 {311}	30300 {309}	30300 {309}	29800 {304}	18200 {186}	13500 {138.0}	8140 {83.0}
	DAP 1000	290 {3.0}	—	—	—	—	—	17400 {178}	14300 {146.0}	8730 {89.0}
								17000 {173}	13900 {142.0}	8430 {86.0}
		390 {4.0}	—	—	—	—	—	23400 {239}	19300 {197.0}	11900 {121.0}
								23000 {235}	18800 {192.0}	11500 {117.0}
		490 {5.0}	—	—	—	—	—	29400 {300}	24300 {248.0}	14900 {152.0}
								29000 {296}	23800 {243.0}	14500 {148.0}
	DAP 1500	290 {3.0}	—	—	—	—	—	—	17200 {175.0}	13500 {138.0}
									16800 {171.0}	13200 {135.0}
		390 {4.0}	—	—	—	—	—	—	22900 {234.0}	18200 {186.0}
									22600 {231.0}	17800 {182.0}
		490 {5.0}	—	—	—	—	—	—	28800 {294.0}	22800 {233.0}
									28400 {290.0}	22400 {229.0}

Note) 1. Positioner is employed in general.

2. In case a back-up system is used for pressure drop of supply air, select the allowable differential pressure whichever is lower-the operating supply air pressure or the back-up system set pressure (trip pressure).

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. Take care not to cause the inlet pressure (P1) to exceed allowable differential pressure at valve-close.

5. Allowable differential pressure limit differs depending on valve seat leakage volume. Figures in the upper portion of the column denote pressure under a leakage rate of 0.01%. Those on the lower side denote pressure under a leakage rate of 0.001%.

Dimensions

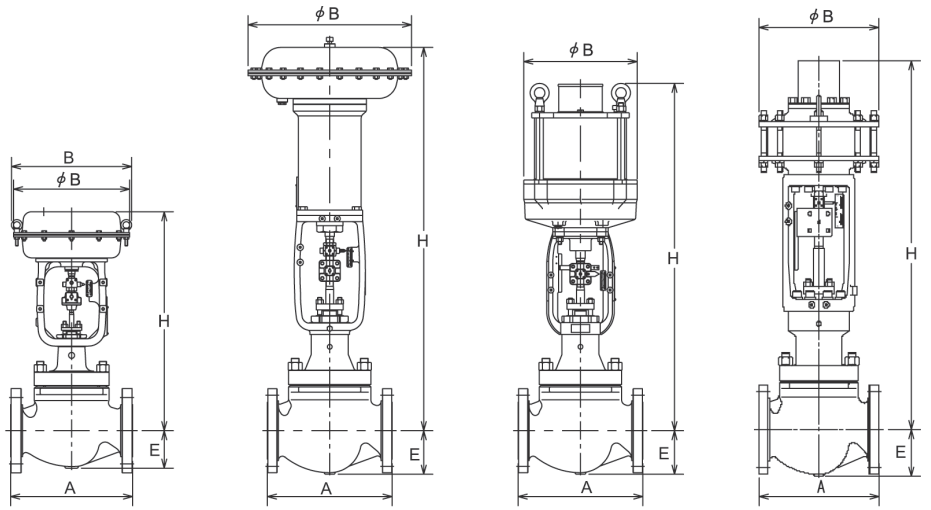
Table 15. Face-to-face dimensions [Unit: mm]

Nominal size (inch)	A						
	JIS 63K	ANSI 900, JPI900		ANSI 1500, JPI 1500		ANSI 2500, JPI 2500	
	RF	RF (SW, BW)	RJ	RF (SW, BW)	RJ	RF (SW, BW)	RJ
1	276	292	292	292	292	318	318
1-1/2	323	333	333	333	333	358	361
2	354	375	378	375	378	400	403
3	431	440	443	460	463	498	504

Table 16. External dimensions [Unit: mm]

Nominal Size (inch)	Actuator Model	H						B	ϕ B	E		
		JIS 63K, ANSI 900 JPI900		ANSI 1500 JPI 1500		ANSI 2500 JPI 2500				JIS 63K ANSI 900 JPI 900	ANSI 1500 JPI 1500	ANSI 2500 JPI 2500
		Plain bonnet	Extension bonnet	Plain bonnet	Extension bonnet	Plain bonnet	Extension bonnet					
1	HA3D, R	710	840	710	840	740	860	363	350	90	90	95
	HA4D, R	870	1000	870	1000	900	1020	520	470			
	VA5R	1115	1245	1115	1245	1145	1265	——	445			
	DAP560	——	——	——	——	——	——	——	380			
1-1/2	HA3D, R	735	875	73	875	780	925	363	350	100	105	120
	HA4D, R	890	1030	890	1030	935	1080	520	470			
	VA5D	1280	1420	1280	1420	1325	1470	——	620			
	VA5R	1390	1530	1390	1530	1435	1580	——	620			
	PSA6R	1235	1375	1235	1375	1280	1445	——	476			
	DAP560	——	——	——	——	——	——	——	380			
	DAP1000	——	——	——	——	——	——	——	470			
2	HA3D, R	765	925	765	925	800	960	363	350	110	120	130
	HA4D, R	925	1085	925	1085	960	1120	520	470			
	VA5D	1315	1475	1315	1475	1350	1510	——	620			
	VA5R	1425	1585	1425	1585	1460	1620	——	620			
	PSA6R	1270	1430	1270	1430	1305	1465	——	476			
	DAP560	——	——	——	——	——	——	——	380			
	DAP1000	——	——	——	——	——	——	——	470			
	DAP1500	——	——	——	——	——	——	——	570			
3	HA3D, R	800	980	800	980	835	1005	363	350	140	150	165
	HA4D, R	960	1140	960	1140	995	1165	520	470			
	VA5D	1345	1525	1345	1525	1380	1550	——	620			
	VA5R	1455	1635	1455	1634	1490	1660	——	620			
	PSA6R	1300	1480	1300	1480	1335	1505	——	476			
	DAP560	——	——	——	——	——	——	——	380			
	DAP1000	——	——	——	——	——	——	——	470			
	DAP1500	——	——	——	——	——	——	——	570			

Note) "H" dimensions are applicable when hand wheel is not provided. When top-mounted hand wheel HA or VA actuators or side-mounted hand wheel PSA6R 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 SS2-PSA100-0100 for type VA, PSA actuators)



a. For HA actuator b. For VA5 actuator c. For PSA6 actuator d. For DAP actuator

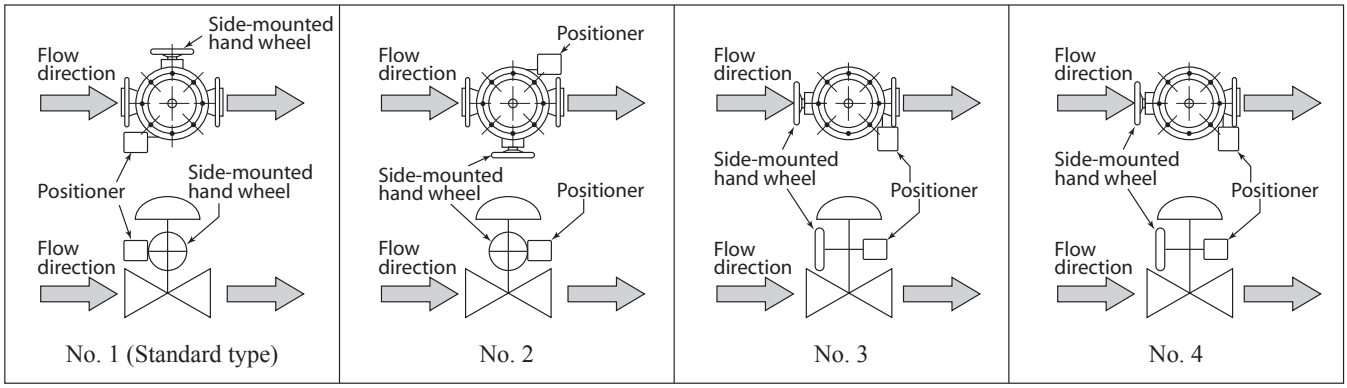
Figure 3. Face-to-face and other dimensions

Table 17. Weight

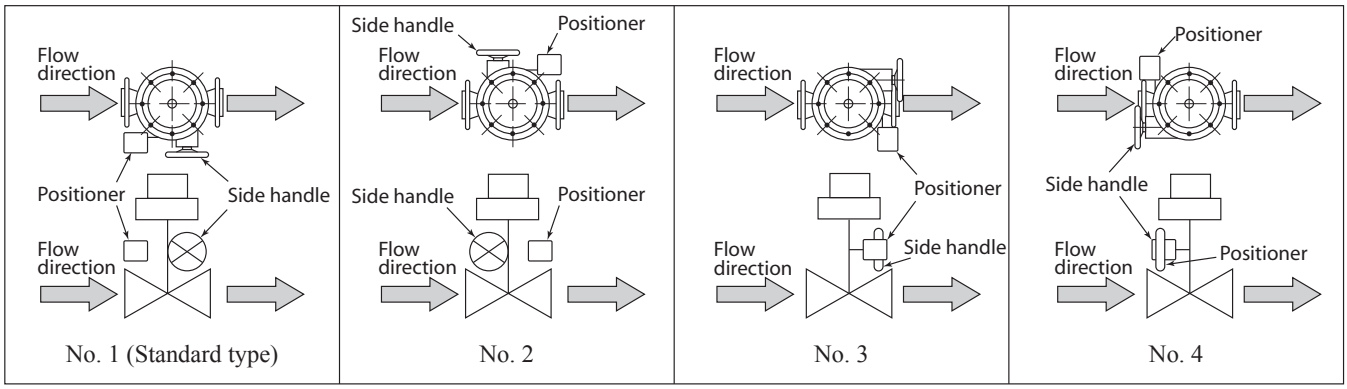
[Unit: kg]

Nominal size (inch)	Actuator Model No.	Weight (Flanged connection)						Weight (Welded connection)					
		JIS63K, ANSI 900 JPI 900		ANSI 1500 JPI 1500		ANSI 2500 JPI 2500		ANSI 900, JIS63K JPI 900		ANSI 1500 JPI 1500		ANSI 2500 JPI 2500	
		Plain bonnet	Extension bonnet	Plain bonnet	Extension bonnet	Plain bonnet	Extension bonnet	Plain bonnet	Extension bonnet	Plain bonnet	Extension bonnet	Plain bonnet	Extension bonnet
1	HA3D, R	55 (52)	60 (57)	60	65	85	90	45	50	50	55	70	75
	HA4D, R	85 (83)	90 (88)	90	95	115	120	80	85	85	90	100	105
	PSA6R	195 (190)	200 (175)	195	200	220	225	185	190	190	195	205	210
	DAP560	— —	— —	—	—	—	—	—	—	—	—	—	—
1-1/2	HA3D, R	60 (55)	65 (60)	65	70	90	95	50	55	55	60	75	80
	HA4D, R	90 (86)	95 (91)	95	100	125	130	80	85	85	90	105	110
	VA5D	190 (188)	195 (193)	195	200	225	230	180	185	185	190	205	210
	VA5R	215 (213)	220 (218)	220	225	250	255	205	210	210	215	230	235
	PSA6R	195 (193)	200 (203)	200	205	230	235	185	190	190	195	210	215
	DAP560	— —	— —	—	—	—	—	—	—	—	—	—	—
	DAP1000	— —	— —	—	—	—	—	—	—	—	—	—	—
2	HA3D, R	90 (61)	80 (71)	75	85	110	120	55	65	60	70	85	95
	HA4D, R	100 (92)	110 (102)	105	115	140	250	85	95	90	100	115	125
	VA5D	200 (194)	210 (204)	205	215	240	250	185	195	190	200	215	225
	VA5R	225 (219)	235 (229)	230	240	265	275	210	220	215	225	240	250
	PSA6R	205 (199)	215 (209)	210	220	245	255	190	200	195	205	220	230
	DAP560	— —	— —	—	—	—	—	—	—	—	—	—	—
	DAP1000	— —	— —	—	—	—	—	—	—	—	—	—	—
	DAP1500	— —	— —	—	—	—	—	—	—	—	—	—	—
3	HA3D, R	105 (97)	115 (107)	140	160	225	245	85	95	570	130	170	190
	HA4D, R	135 (128)	145 (138)	170	190	255	275	115	125	140	160	200	220
	VA5D	235 (230)	245 (240)	270	290	355	375	215	225	240	260	300	320
	VA5R	260 (255)	270 (265)	295	315	380	400	240	250	265	285	325	345
	PSA6R	240 (235)	250 (245)	275	295	360	380	220	230	245	265	305	325
	DAP560	— —	— —	—	—	—	—	—	—	—	—	—	—
	DAP1000	— —	— —	—	—	—	—	—	—	—	—	—	—
	DAP1500	— —	— —	—	—	—	—	—	—	—	—	—	—

(PSA1, HA and VA5 Actuator)



(PSA6 Actuator)



(DAP Actuator)

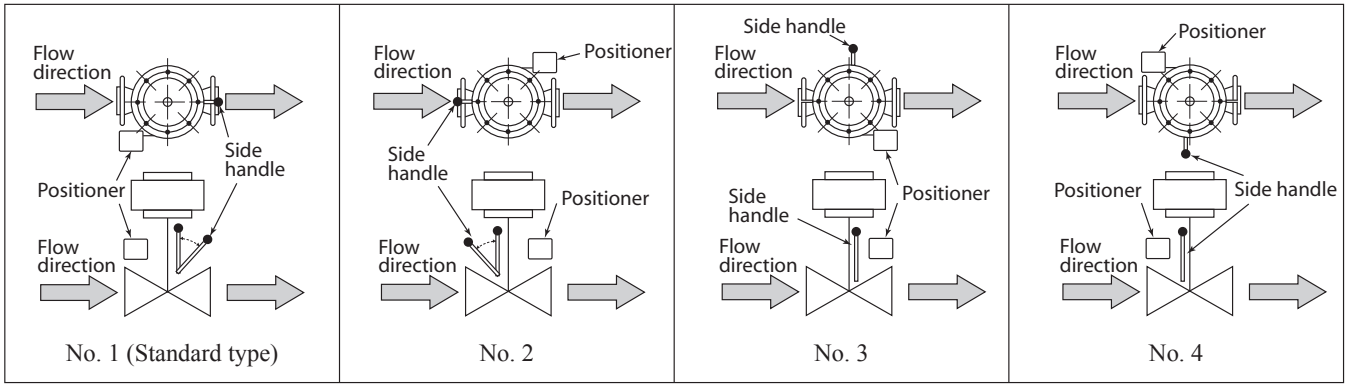


Figure 4. Actuator orientation

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

Ordering information

When ordering, please specify;

1) Model Number: HPS
2) Nominal size × Cv value
3) Type and rating of end connections
4) Body and trim material, necessity of hardening
5) Valve and plug characteristics
6) Type of bonnet
7) Type of actuator and air to diaphragm
8) Valve action (direct or reverse)
9) Accessories (positioner, hand wheel, pressure regulator and etc.)
10) Special requirement of degreasing, copper free 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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https://www.azbil.com/products/factory/order.html

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1st edition: Mar. 2001
9th edition: June 2019