

CV3000 Series

Top-Guided Single Seated Control Valves

Model HTS

OVERVIEW

Model HTS Top-guided Single Seated Control Valves are designed for heavyduty service. The compact valve body, having a S-shape flow passage that features low pressure loss, allows a large flow capacity, rangeability, and high accuracy flow characteristics.

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 IEC or JIS Standards. The actuator integrated with simplest mechanisms utilizes a compact yet powerful diaphragm actuator loaded with multiple springs.

The model HTS Valves are widely applicable for reliable control, with high shut-off performance, in high or low temperature, high 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:

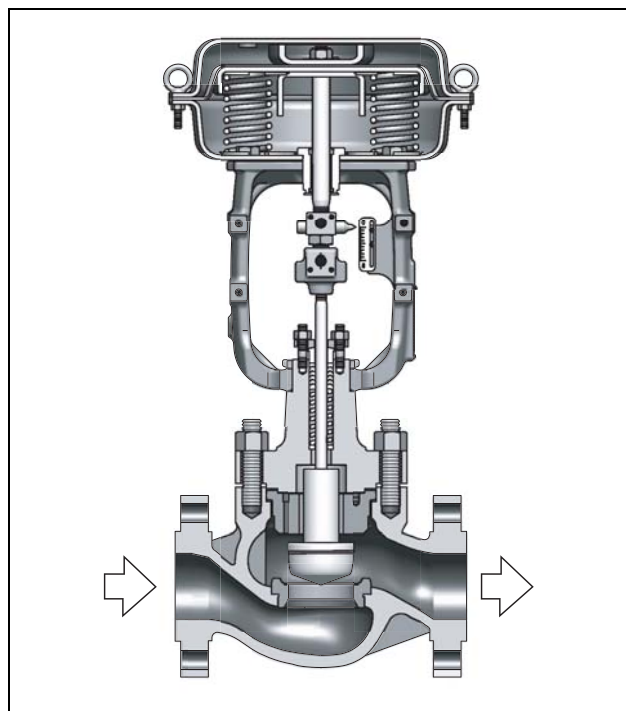
- Flanged end; FF, RF, RJ, LG
- Tongue and groove (groove)
- Male and female (female)
- Welding end; SW (1½, 2 inches)
- BW (2½ to 8 inches)

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)
- Bellows type (for operating temperature and pressure range, refer to Figure 3.)

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 asbestos yarn, PTFE-impregnated asbestos yarn, asbestos yarn with graphite, or graphite packing is used.

Note) PTFE: Polytetrafluoroethylene

Gasket

Type: Flat type, saw-tooth type

Material

Carbon steel (S15C), stainless steel (SUS316, SUS316L, SUS329J1), copper, aluminum, titanium, ASTM B574 (Hastelloy C-276 equivalent), or alloy 20

Trim**Valve plug**

Single-seated, Contoured-type plug

- High-capacity (for flow characteristics, refer to Figure 1.)
 - Metal seat: Equal percentage (%C), Linear (LC)
 - Soft seat: Equal percentage (%T), Linear (LT)
 - High-flow characteristics
 - Metal seat (for flow characteristics, refer to Figure 2-2.)
 - Equal percentage (%CF), Linear (LCF)
 - Soft seat (for flow characteristics, refer to Figure 2-2.)
 - Equal percentage (%TF), Linear (LTF)
 - Single-seat quick-opening type plug
 - Metal (Stellite) seat (QS)
- (When soft seat is required, use a contoured type soft seat.)

Note) For operating temperature or pressure range of soft seat, refer to Figure 3.

Material

For combining the valve body, trim materials and the operating temperature ranges, refer to Table 1.

Note) For fluid conditions requiring stellite, refer to Figure 4.

Actuator**Type**

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

Action: Direct or reverse action

Diaphragm

Type HA: Cloth embedded ethylene propylene rubber

Type VA: Cloth embedded chloroprene rubber

Spring range

20 to 98 kPa {0.2 to 1.0 kgf/cm²}, or
 80 to 240 kPa {0.8 to 2.4 kgf/cm²} (Type HA or VA5)
 200 to 340 kPa {2.0 to 3.5 kgf/cm²}, or
 200 to 390 kPa {2.0 to 4.0 kgf/cm²} (Type PSA6)

Supply pressure

Diaphragm actuator

Type 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: 350 to 500 kPa {4 to 5 kgf/cm²}

Piston actuator

Type VP: 290 to 490 kPa {3 to 5 kgf/cm²}

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

Air connection

Rc1/4 female tap, or 1/4NPT female tap

Note) With Type VA or VP, Rc1/4 adapter or 1/4NPT adapter is provided on Rc1/2 female tap (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 the specification sheets and installation drawings of respective accessories.

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

Actuator	Positioner		Manual hand-wheel	
	P/P	I/P	Top	Side
HA1	VPE	HEP/AVP	THM	-
HA2 to 4	HTP	HEP/AVP	THM	SHM
VA5	HTP	HEP/AVP	THM	SHM
PSA6	HTP/VPP	HEP/AVP	-	SHM
VP5 to 7	VPP	HEP/AVP	-	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
- Double gland
- Copper free treatment
- Stainless steel (SUS304) Atmosphere-exposed nuts and bolts
- Special air piping and joint
- Sand-/dust-preventive measures
- Saline damage countermeasures
- Tropical-area use specifications
- Cold-area use specifications
- With drain plug
- Oil/water free treatment
- Vacuum service

Performance**Rated Cv value**

Refer to Table 3, 4 and 5.

Flow characteristics

Refer to Figure 1 and 2.

Inherent rangeability

50 : 1

- Optional; 75 : 1

Allowable differential pressure

Refer to Table 6 to 13.

Leakage specification (Percentage to rated Cv value)

- Contoured type plug
 IEC534-4-1982or JIS B 2007-1993
 <Metal seat>
 Standard..... Class IV: Leakage less than 0.01% of maximum valve capacity.
 Option..... Leakage less than 0.001% of maximum valve capacity.
- <Soft seat>
 Class VI: Leakage less than 0.00001% of maximum valve capacity.
- Quick-opening type plug
 <Metal (Stellite) seat>
 Leakage less than 0.00001% 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 $\pm 5\%$ F.S. ($\pm 9\%$ F.S.)

With positioner: Within $\pm 1\%$ F.S. ($\pm 2\%$ F.S.)

($\pm 3\%$ F.S. with model VPE positioner, $\pm 2\%$ F.S. with model AVP/HEP positioner)

Note) 1) When positioner is not provided, operating
may vary depending on type of packings used.
Refer to document No. ID2-8113-0040.

2) Parenthesized figures are applicable to Type
HA1.

3) Double parenthesized figures are applicable to
type PSA6R.

Dimensions

Refer to Figure 6 and Table 14 and Table 15.

Weight

Refer to Table 16.

Actuator orientation

Refer to Figure 6.

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	FC20	SCPH2	SCPH21	SCPH61	SCPL1	SCS11	SCS13A	SCS14A	SCS16A	SCS19A
		ASTM	A126Gr.B	A216WCB	A217WC6	A217C5	A352LCB		A351CF8	A351CF8M	A351CF3M	A351F3
JIS	SUS304		0 to +20	-5 to +300	—	—	-45 to +300	—	-196 to +300	—	—	—
AISI	304											
JIS	SUS316		0 to +200	-5 to +300	—	—	-45 to +300	—	-196 to +300	-196 to +300	—	—
AISI	316											
JIS	SUS304L		—	—	—	—	-45 to +300	—	-196 to +300	—	—	-196 to +300
AISI	304L											
JIS	SUS316L		—	—	—	—	-45 to +300	—	-196 to +300	-196 to +300	-196 to +300	-196 to +300
AISI	316L											
JIS	SUS440C		—	-5 to +425	-5 to +425	-5 to +425	—	—	—	—	—	—
AISI	440C											
JIS	SUS329J1		—	—	—	—	—	-50 to +300	—	-196 to +300	—	—
AISI	SUS304 Stellite		—	-5 to +425	-5 to +550	-5 to +566	-45 to +350	—	-196 to +550	—	—	—
JIS	304 Stellite											
AISI	SUS304 stellite face		—	-5 to +425	-5 to +550	-5 to +566	-45 to +350	—	-196 to +550	—	—	—
JIS	304 Full-surface stellite											
AISI	SUS316 Stellite		—	-5 to +425	-5 to +550	-5 to +566	-45 to +350	—	-196 to +550	-196 to +550	—	—
JIS	316 Stellite											
AISI	SUS316 stellite face		—	-5 to +425	-5 to +550	-5 to +566	-45 to +350	—	-196 to +550	-196 to +550	—	—
JIS	316 stellite face											
AISI	SUS304L Stellite		—	—	—	—	-45 to +350	—	-196 to +550	—	—	-196 to +450
JIS	304L Stellite											
AISI	SUS316L Stellite		—	—	—	—	-45 to +350	—	-196 to +450	-196 to +450	-196 to +450	-196 to +450
JIS	316L Stellite											
AISI	SUS329J1 Stelite		—	—	—	—	—	-50 to +550	—	-196 to +550	—	—
JIS	SUS304 Soft seat		0 to +200	-5 to +230	—	—	-45 to +230	—	-80 to +230	—	—	—
AISI	304 Soft seat											
JIS	SUS316 Soft seat		0 to +200	-5 to +230	—	—	-45 to +230	—	-80 to +230	-80 to +230	—	—
AISI	316 Soft seat											
JIS	SUS316L Soft seat		—	—	—	—	-45 to +230	—	-80 to +230	-80 to +230	-80 to +230	-80 to +230
AISI	316L Soft seat											
JIS	SUS329J1 Soft seat		—	—	—	—	—	-50 to +230	—	-80 to +230	—	—

Note) 1) Column bordered with solid line("□") denote values applicable to standard body/trim combination.

2) ASTM Specifications indicate materials equivalent to those designated by JIS

Table 2 Body / trim metal combinations and operating temperature ranges (°C)

Body material	JIS	SCPH2	SCS31A	SCS14A	SCS16A	SCS19A	Titanium	ASTM B574 *	Alloy 20
	ASTM	A216WCB	A351CF8	A351CF8M	A351CF3M	A351CF3	—	—	—
JIS	Titanium alloy	—	—	—	—	—	-196 to +351	—	—
JIS	Titanium	—	—	—	—	—	-196 to +315	—	—
JIS	ASTM B574 *	—	—	—	—	—	—	-196 to +450	—
JIS	Alloy 20	—	—	—	—	—	—	—	-196 to +300
JIS	Monel	-5 to +300	-196 to +300	-196 to +300	-196 to +300	-196 to +300	—	—	—

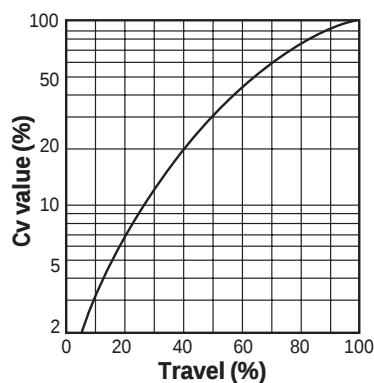
Note) 1) ASTM Specifications indicate materials equivalent to those designated by JIS

2) *: ASTM B574 is equivalent to Hastelloy C-276.

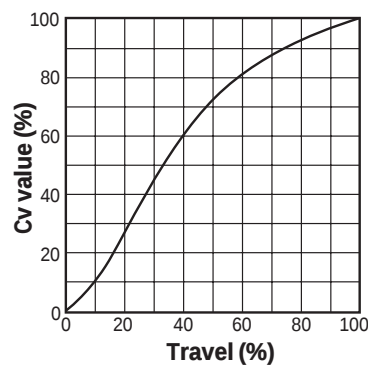
Cv value and travel

Table 3 High capacity type contoured plug

Nominal size (inches)		1½	2	2½	3	4	6	8
Port size (inches)		1½	2	2½	3	4	6	8
Rated Cv value	(%C,LC,%T,LT)	30	50	85	125	200	420	700
Rated travel (mm)		25		38		50		75



a. Equal percentage characteristics (%C: Metal seat, %T: Soft seat)

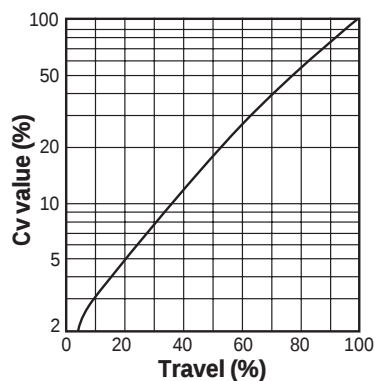


b. Linear characteristics (LC: Metal seat, LT: Soft seat)

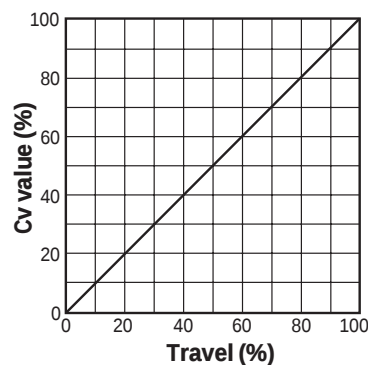
Figure 1 Flow characteristics: High-capacity type

Table 4 High-flow characteristic type contoured plug

Nominal size (inches)	2							2½				3				4			6				8			
	1½																									
Port size (inches)	2.5	4.0	6.3	1	1¼	1½	2	1½	2	2½	2	2½	3	2½	3	4	4	5	6	5	6	8				
Rated Cv value (%CF, LCF, %TF, LTF)				10	17	24	44	24	44	68	44	68	99	68	99	175	175	275	360	275	360	640				
Rated travel (mm)	25							38								50				75						

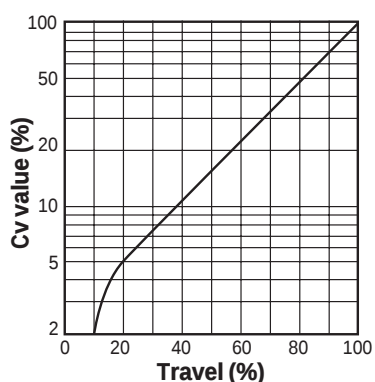


Equal percentage characteristics (%CF: Metal seat)

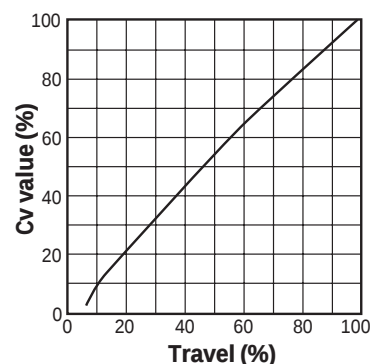


Linear characteristics (LCF: Metal seat)

Figure 2-1 Flow characteristics: High-flow characteristic type (%CF, LCF)



Equal percentage characteristics (%TF: Soft seat)



Linear characteristics (LTF: Soft seat)

Figure 2-2 Flow characteristics: High-flow characteristic type (%TF, LTF)

Note) The above graphs indicate typical flow characteristic

Table 5 Quick-opening type plug

Normal size (inches)		1½	2	2½	3	4	6	8
Port size (inches)		1½	2	2½	3	4	6	8
Rated Cv value	(QS)	35	55	95	135	220	460	720
Rated travel (mm)		10	13	19	19	25	30	50

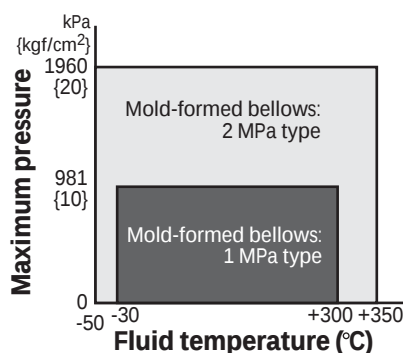


Figure 3 Operating temperature and pressure range of bellows type bonnet

Note) 1) Standard bellows material is SUS316L.
2) Welded type bellows is also available upon request.

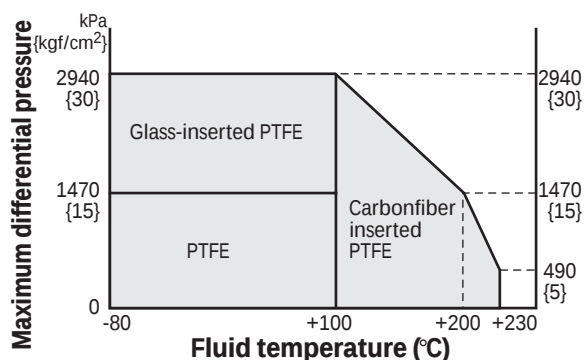


Figure 4 Operating temperature and maximum differential pressure range of soft-seat type

Note) If there is any possibility to cause erosion due to saturated steam or superheated-water, use the metal seat

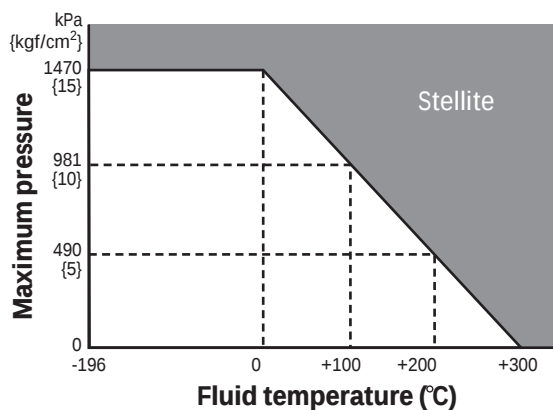
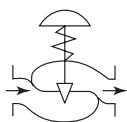


Figure 5 Temperature/nominal differential pressure ranges requiring Stellite

Note) 1) When cavitation service, oil prohibitive service, or retention of valve-close performance is required, use of Stellite is recommended regardless of temperature or differential pressure.

2) When rated Cv value is 0.16 or lower, stellite faced valve plugs are standard.

Allowable differential pressure**Contoured-type metal seat (%CF, LCF, %C, LC)****Valves with type HA or VA actuator****Table 6 Air-to-close**

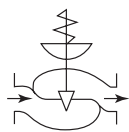
Actuator model no.	Supply pressure kPa {kgf/cm ² }	Spring range kPa {kgf/cm ² }	Positioner	Differential pressure (kPa {kgf/cm ² })												
				Cv value			Port size (inches)									
				2.5	4.0	6.3	1	1¼	1½	2	2½	3	4	5	6	8
HA1D	140 {1.4}	20 to 98 {0.2 to 1.0}	△	981 {10.0}	981 {10.0}	550 {5.6}	320 {3.3}	200 {2.0}	140 {1.4}	80 {0.8}	—	—	—	—	—	—
	160 {1.6}	20 to 98 {0.2 to 1.0}	○	3920 {40.0}	3920 {40.0}	2740 {28.0}	1570 {16.0}	970 {9.9}	700 {7.1}	400 {4.1}	—	—	—	—	—	—
	390 {4.0}	80 to 240 {0.8 to 2.4}	○	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	2840 {29.0}	2060 {21.0}	1180 {12.0}	—	—	—	—	—	—
HA2D	140 {1.4}	20 to 98 {0.2 to 1.0}	△	1960 {20.0}	1960 {20.0}	1070 {10.9}	620 {6.3}	370 {3.8}	260 {2.7}	160 {1.6}	98 {1.0}	70 {0.7}	50 {0.5}	—	—	—
	160 {1.6}	20 to 98 {0.2 to 1.0}	○	3920 {40.0}	3920 {40.0}	3920 {40.0}	3100 {31.6}	1890 {19.3}	1340 {13.7}	760 {7.8}	500 {5.1}	340 {3.5}	200 {2.0}	—	—	—
	390 {4.0}	80 to 240 {0.8 to 2.4}	○	—	—	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	2310 {21.7}	1460 {14.9}	1030 {10.5}	580 {5.9}	—	—	—
HA3D	140 {1.4}	20 to 98 {0.2 to 1.0}	△	—	—	—	1100 {11.2}	670 {6.8}	470 {4.8}	270 {2.8}	170 {1.7}	120 {1.2}	70 {0.7}	40 {0.4}	30 {0.3}	—
	160 {1.6}	20 to 98 {0.2 to 1.0}	○	—	—	—	3920 {40.0}	3350 {34.2}	2370 {24.2}	1370 {14.0}	860 {8.8}	610 {6.2}	340 {3.5}	220 {2.2}	140 {1.4}	—
	390 {4.0}	80 to 240 {0.8 to 2.4}	○	—	—	—	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	2600 {26.5}	1830 {18.7}	1030 {10.5}	660 {6.7}	400 {4.1}	—
HA4D	140 {1.4}	20 to 98 {0.2 to 1.0}	△	—	—	—	1880 {19.2}	1160 {11.8}	810 {8.3}	470 {4.8}	290 {3.0}	220 {2.2}	120 {1.2}	70 {0.7}	50 {0.5}	30 {0.3}
	160 {1.6}	20 to 98 {0.2 to 1.0}	○	—	—	—	3920 {40.0}	3920 {40.0}	3920 {40.0}	2370 {24.2}	1490 {15.2}	1050 {10.7}	600 {6.1}	380 {3.9}	240 {2.4}	150 {1.5}
	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}	3160 {32.2}	1780 {18.2}	1140 {11.6}	700 {7.1}	430 {4.4}
VA5D	140 {1.4}	20 to 98 {0.2 to 1.0}	△	—	—	—	—	—	1070 {10.9}	620 {6.3}	410 {4.2}	280 {2.9}	160 {1.6}	110 {1.1}	60 {0.6}	40 {0.4}
	160 {1.6}	20 to 98 {0.2 to 1.0}	○	—	—	—	—	—	3920 {40.0}	3130 {31.9}	2040 {20.8}	1440 {14.7}	810 {8.3}	520 {5.3}	310 {3.2}	200 {2.0}

Note) 1) Column bordered with solid lines (" ") denote types provided with standard-type 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 B 16. 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.

Allowable differential pressure**Contoured-type metal seat (%CF, LCF, %C, LC)****Valves with type HA or VA actuator****Table 7 Air-to-open**

Actuator Model No.	Supply pressure kPa {kgf/cm ² }	Spring range kPa {kgf/cm ² }	Positioner	Differential Pressure (kPa {kgf/cm ² })												
				Cv value			Port size (inches)									
				2.5	4.0	6.3	1	1¼	1½	2	2½	3	4	5	6	8
HA1R	140 {1.4}	20 to 98 {0.2 to 1.0}	△	981 {10.0}	981 {10.0}	550 {5.6}	320 {3.3}	200 {2.0}	140 {1.4}	80 {0.8}	—	—	—	—	—	
	270 {2.8}	80 to 240 {0.8 to 2.4}	○	3920 {40.0}	3920 {40.0}	3820 {39.0}	2160 {22.0}	1270 {13.0}	970 {9.9}	560 {5.7}	—	—	—	—	—	
				5100 {52.0}	5100 {52.0}											
HA2R	140 {1.4}	20 to 98 {0.2 to 1.0}	△	1960 {20.0}	1960 {20.0}	1070 {10.9}	620 {6.3}	370 {3.8}	260 {2.7}	160 {1.6}	98 {1.0}	70 {0.7}	50 {0.5}	—	—	
	270 {2.8}	80 to 240 {0.8 to 2.4}	○	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	2650 {27.0}	1870 {19.1}	1090 {11.1}	680 {6.9}	480 {4.9}	270 {2.8}	—	—	
				9810 {100}	9810 {100}	7450 {75.9}	4310 {44.0}									
HA3R	140 {1.4}	20 to 98 {0.2 to 1.0}	△	—	—	—	1100 {11.2}	670 {6.8}	470 {4.8}	270 {2.8}	170 {1.7}	120 {1.2}	70 {0.7}	40 {0.4}	30 {0.3}	
	270 {2.8}	80 to 240 {0.8 to 2.4}	○	—	—	—	3920 {40.0}	3920 {40.0}	3330 {34.0}	1920 {19.6}	1210 {12.3}	850 {8.7}	480 {4.9}	300 {3.1}	190 {1.9}	
				—	—	—	7650 {78.0}	4610 {47.0}								
HA4R	140 {1.4}	20 to 98 {0.2 to 1.0}	△	—	—	—	1830 {18.7}	1130 {11.5}	820 {8.4}	470 {4.8}	290 {3.0}	220 {2.2}	120 {1.2}	70 {0.7}	50 {0.5}	
	270 {2.8}	80 to 240 {0.8 to 2.4}	○	—	—	—	3920 {40.0}	3920 {40.0}	3920 {40.0}	3090 {31.5}	2090 {21.3}	1470 {15.0}	830 {8.5}	530 {5.4}	320 {3.3}	
				—	—	—	9810 {100}	7860 {80.2}	5690 {58.0}							
VA5R	140 {1.4}	20 to 98 {0.2 to 1.0}	△	—	—	—	—	—	1080 {11.0}	610 {6.2}	410 {4.2}	280 {2.9}	170 {1.7}	110 {1.1}	60 {0.6}	
	270 {2.8}	80 to 240 {0.8 to 2.4}	○	—	—	—	—	—	3920 {40.0}	3920 {40.0}	2860 {29.2}	2020 {20.6}	1140 {11.6}	720 {7.4}	440 {4.5}	
				—	—	—	—	—	7630 {77.8}	4390 {44.8}						
PSA6 R	400 {4.0} *1	200 to 340 {2.0 to 3.5}	○	—	—	—	—	—	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	2370 {24.2}	—	—	
	500 {5.0} *2	200 to 390 {2.0 to 4.0}	○	—	—	—	—	—	—	—	—	—	2370 {24.2}	1520 {15.5}	930 {9.5}	
	400 {4.0} *3	200 to 340 {2.0 to 3.5}		—	—	—	—	—	—	—	—	—	1520 {15.5}	930 {9.5}	630 {6.4}	

Note) 1) Column bordered with solid lines ("□") denote types provided with standard-type 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 B 16. 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.

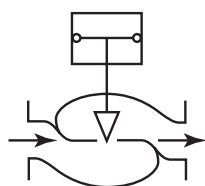
5) *1...Applicable to valve sizes of 2½ to 4 inches, *2...Applicable to valve size of 6 inches, *3...Applicable to valve size 8 inches.

Allowable differential pressure

Contoured-type metal seat (%CF, LCF, %C, LC)

Valves with type VP actuator

Table 8 Direct and reverse action



Actuator Model No.	Supply pressure kPa {kgf/cm ² }	Positioner	Differential Pressure (by port size (inches)) kPa {kgf/cm ² }							
			1½	2	2½	3	4	5	6	8
VP5	290 {3.0}	○	3920 {40.0}	3920 {40.0}	3920 {40.0}	3610 {36.8}	2030 {20.7}	1290 {13.2}	780 {8.0}	—
			9810 {100.0}	8130 {82.9}	5100 {52.0}					
	390 {4.0}	○	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	2730 {27.8}	1740 {17.8}	1060 {10.8}	—
			9810 {100.0}	9810 {100.0}	6860 {70.0}					
	490 {5.0}	○	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3420 {34.9}	2200 {22.4}	1330 {13.6}	—
			9810 {100.0}	9810 {100.0}	8630 {88.0}					
VP6	290 {3.0}	○	—	—	3920 {40.0}	3920 {40.0}	3620 {36.9}	2310 {23.6}	1410 {14.4}	830 {8.5}
					9120 {93.0}	6370 {65.0}				
	390 {4.0}	○	—	—	3920 {40.0}	3920 {40.0}	3920 {40.0}	3120 {31.8}	1890 {19.3}	1120 {11.4}
					9810 {100.0}	8630 {88.0}	4800 {49.0}			
	490 {5.0}	○	—	—	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	2380 {24.3}	1410 {14.4}
					9810 {100.0}	9810 {100.0}	6080 {62.0}			
VP7	290 {3.0}	○	—	—	—	—	3920 {40.0}	3480 {35.5}	2120 {21.6}	1270 {13.0}
							5210 {53.1}			
	390 {4.0}	○	—	—	—	—	3920 {40.0}	3920 {40.0}	2840 {29.0}	1720 {17.5}
							6970 {71.1}	4610 {47.0}		
	490 {5.0}	○	—	—	—	—	3920 {40.0}	3920 {40.0}	3570 {36.4}	2160 {22.0}
							8790 {89.6}	5880 {60.0}		

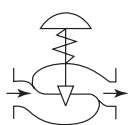
- Note) 1) When a backup system for pressure drop at the air source is used, select the allowable differential pressure from whichever is lower-constant supplied air pressure or backup system set pressure (trip pressure).
- 2) ○: Positioner is necessary. △: Can be operated either with or without positioner.
- 3) Take care not to cause the maximum allowable differential pressure to exceed the maximum operating pressure designated by ANSI B 16. 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.

Allowable differential pressure

Contoured type soft seat (%TF, LTF, %T,LT)

Valves with a type HA or VA actuator

Table 9 Air-to-close



Actuator Model No.	Supply pressure	Spring range kPa {kgf/cm ² }	Positioner	Differential Pressure (kPa {kgf/cm ² })												
				Cv value			Port size (inches)									
				2.5	4.0	6.3	1	1¼	1½	2	2½	3	4	5	6	8
HA1D	140 {1.4}	20 to 98 {0.2 to 1.0}	△	710 {7.2}	710 {7.2}	390 {4.0}	220 {2.3}	140 {1.4}	98 {1.0}	60 {0.6}	—	—	—	—	—	—
	160 {1.6}	20 to 98 {0.2 to 1.0}	○	2940 {30.0}	2940 {30.0}	1860 {19.0}	1080 {11.0}	690 {7.0}	480 {4.9}	280 {2.9}	—	—	—	—	—	—
	390 {4.0}	80 to 240 {0.8 to 2.4}	○	—	—	2940 {30.0}	2940 {30.0}	1960 {20.0}	1370 {14.0}	840 {8.6}	—	—	—	—	—	—
HA2D	140 {1.4}	20 to 98 {0.2 to 1.0}	△	1370 {14.0}	1370 {14.0}	740 {7.6}	430 {4.4}	260 {2.7}	190 {1.9}	110 {1.1}	70 {0.7}	50 {0.5}	30 {0.3}	—	—	—
	160 {1.6}	20 to 98 {0.2 to 1.0}	○	2940 {30.0}	2940 {30.0}	2940 {30.0}	2160 {22.0}	1320 {13.5}	940 {9.6}	540 {5.5}	350 {3.6}	240 {2.5}	140 {1.4}	—	—	—
	390 {4.0}	80 to 240 {0.8 to 2.4}	○	—	—	2940 {30.0}	2940 {30.0}	2940 {30.0}	2740 {28.0}	1470 {15.0}	1020 {10.4}	720 {7.4}	400 {4.1}	—	—	—
HA3D	140 {1.4}	20 to 98 {0.2 to 1.0}	△	—	—	—	760 {7.8}	470 {4.8}	330 {3.4}	200 {2.0}	120 {1.2}	80 {0.8}	50 {0.5}	30 {0.3}	20 {0.2}	-
	160 {1.6}	20 to 98 {0.2 to 1.0}	○	—	—	—	2940 {30.0}	2350 {24.0}	1670 {17.0}	960 {9.8}	610 {6.2}	420 {4.3}	240 {2.5}	150 {1.5}	90 {0.9}	-
	390 {4.0}	20 to 98 {0.2 to 1.0}	○	—	—	—	2940 {30.0}	2940 {30.0}	2940 {30.0}	2740 {28.0}	1760 {18.0}	1270 {13.0}	720 {7.4}	460 {4.7}	280 {2.9}	-
HA4D	140 {1.4}	20 to 98 {0.2 to 1.0}	△	—	—	—	—	—	570 {5.8}	330 {3.4}	200 {2.1}	150 {1.5}	80 {0.8}	50 {0.5}	30 {0.3}	20 {0.2}
	160 {1.6}	20 to 98 {0.2 to 1.0}	○	—	—	—	—	—	2740 {28.0}	1670 {17.0}	1040 {10.6}	740 {7.5}	420 {4.3}	260 {2.7}	170 {1.7}	98 {1.0}
	390 {4.0}	80 to 240 {0.8 to 2.4}	○	—	—	—	—	—	2940 {30.0}	2940 {30.0}	2940 {30.0}	2160 {22.0}	1240 {12.7}	790 {8.1}	490 {5.0}	300 {3.1}
VA5D	140 {1.4}	20 to 98 {0.2 to 1.0}	△	—	—	—	—	—	—	—	280 {2.9}	200 {2.0}	110 {1.1}	80 {0.8}	40 {0.4}	30 {0.3}
	160 {1.6}	20 to 98 {0.2 to 1.0}	○	—	—	—	—	—	—	—	1430 {14.6}	1010 {10.3}	570 {5.8}	360 {3.7}	220 {2.2}	140 {1.4}

Note) 1) Column bordered with solid lines ("□") denote types provided with standard-type actuator.

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

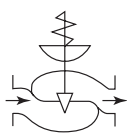
3) Take care not to cause the maximum allowable differential pressure to exceed the maximum operating pressure designated by ANSI B 16. 34-1981 or JIS B2201-1984.

Allowable differential pressure

Contoured type soft seat (%TF, LTF, %T,LT)

Valves with a type HA or VA actuator

Table 10 Air-to-open



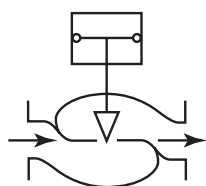
Actuator Model No.	Supply pressure	Spring range kPa {kgf/cm ² }	Positioner	Differential Pressure (kPa {kgf/cm ² })													
				Cv value			Port size (inches)										
				2.5	4.0	6.3	1	1¼	1½	2	2½	3	4	5	6	8	
HA1R	140 {1.4}	20 to 98 {0.2 to 1.0}	△	710 {7.2}	710 {7.2}	390 {4.0}	220 {2.3}	140 {1.4}	98 {1.0}	60 {0.6}	—	—	—	—	—	—	
	270 {2.8}	80 to 240 {0.8 to 2.4}	○	2940 {30.0}	2940 {30.0}	2650 {27.0}	1570 {16.0}	950 {9.7}	680 {6.9}	390 {4.0}	—	—	—	—	—	—	
HA2R	140 {1.4}	20 to 98 {0.2 to 1.0}	△	1370 {14.0}	1370 {14.0}	740 {7.6}	430 {4.4}	260 {2.7}	190 {1.9}	110 {1.1}	70 {0.7}	50 {0.5}	30 {0.3}	—	—	—	
	270 {2.8}	80 to 240 {0.8 to 2.4}	○	2940 {30.0}	2940 {30.0}	2940 {30.0}	2940 {30.0}	1860 {19.0}	970 {9.9}	760 {7.8}	470 {4.8}	330 {3.4}	200 {2.0}	—	—	—	
HA3R	140 {1.4}	20 to 98 {0.2 to 1.0}	△	—	—	—	760 {7.8}	470 {4.8}	330 {3.4}	200 {2.0}	120 {1.2}	80 {0.8}	50 {0.5}	30 {0.3}	20 {0.2}	—	
	270 {2.8}	80 to 240 {0.8 to 2.4}	○	—	—	—	2940 {30.0}	2940 {30.0}	2330 {23.8}	1340 {13.7}	840 {8.6}	600 {6.1}	330 {3.4}	200 {2.1}	130 {1.3}	—	
HA4R	140 {1.4}	20 to 98 {0.2 to 1.0}	△	—	—	—	—	—	570 {5.8}	330 {3.4}	200 {2.1}	150 {1.5}	80 {0.8}	50 {0.5}	30 {0.3}	20 {0.2}	
	270 {2.8}	80 to 240 {0.8 to 2.4}	○	—	—	—	—	—	2940 {30.0}	2160 {22.0}	1460 {14.9}	1030 {10.5}	580 {5.9}	360 {3.7}	220 {2.3}	140 {1.4}	
VA5R	140 {1.4}	20 to 98 {0.2 to 1.0}	△	—	—	—	—	—	—	—	280 {2.9}	200 {2.0}	110 {1.1}	80 {0.8}	40 {0.4}	30 {0.3}	
	270 {2.8}	80 to 240 {0.8 to 2.4}	○	—	—	—	—	—	—	—	2000 {20.4}	1410 {14.4}	790 {8.1}	500 {5.1}	300 {3.1}	200 {2.0}	
PSA6R	400 {4.0} *1	200 to 340 {2.0 to 3.5}	○	—	—	—	—	—	—	—	2940 {30.0}	2940 {30.0}	1660 {16.9}	—	—	—	
	500 {5.0} *2	200 to 390 {2.0 to 4.0}	○	—	—	—	—	—	—	—	—	—	1660 {16.9}	1060 {10.8}	660 {6.7}	—	
	400 {4.0} *3	200 to 340 {2.0 to 3.5}	○	—	—	—	—	—	—	—	—	—	—	1060 {10.8}	660 {6.7}	440 {4.5}	

Note) 1) Column bordered with solid lines ("□") denote types provided with standard-type 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 B 16. 34-1981 or JIS B2201-1984.

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.

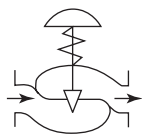
Allowable differential pressure**Contoured type soft seat (%TF, LTF, %T,LT)****Valves with type VP actuator****Table 11 Direct and reverse action**

Actuator Model No.	Supply pressure kPa {kgf/cm ² }	Positioner	Differential Pressure (by port size (inches)) kPa {kgf/cm ² }					
			2½	3	4	5	6	8
VP5	290 {3.0}	○	2940 {30.0}	2530 {25.8}	1420 {14.5}	900 {9.2}	550 {5.6}	—
	390 {4.0}	○	2940 {30.0}	2940 {30.0}	1910 {19.5}	1220 {12.5}	740 {7.6}	—
	490 {5.0}	○	2940 {30.0}	2940 {30.0}	2390 {24.4}	1540 {15.7}	930 {9.5}	—
VP6	290 {3.0}	○	2940 {30.0}	2940 {30.0}	2530 {25.8}	1620 {16.5}	990 {10.1}	590 {6.0}
	390 {4.0}	○	2940 {30.0}	2940 {30.0}	2940 {30.0}	2190 {22.3}	1320 {13.5}	780 {8.0}
	490 {5.0}	○	2940 {30.0}	2940 {30.0}	2940 {30.0}	2740 {28.0}	1670 {17.0}	990 {10.1}
VP7	290 {3.0}	○	—	—	—	2440 {24.9}	1480 {15.1}	890 {9.1}
	390 {4.0}	○	—	—	—	2940 {30.0}	1990 {20.3}	1210 {12.3}
	490 {5.0}	○	—	—	—	2940 {30.0}	2500 {25.5}	1510 {15.4}

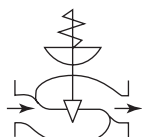
Note) 1) When a backup system for pressure drop at the air source is used, select the allowable differential pressure from whichever is lower-constant supplied air pressure or backup system set pressure (trip pressure).

2) ○: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 B 16. 34-1981 or JIS B2201-1984.

Allowable differential pressure**Quick-opening-type metal (Stellite) seat (QS)****Valve with Type HA or VA actuator****Table 12 Air-to-close**

Actuator Model No.	Supply pressure kPa {kgf/cm ² }	Differential pressure (by port size (inches)) kPa {kgf/cm ² }						
		1½	2	2½	3	4	6	8
HA1D	140 {1.4}	320 {3.3}	200 {2.0}	—	—	—	—	—
	290 {3.0}	1470 {15.0}	960 {9.8}	—	—	—	—	—
HA2D	140 {1.4}	1090 {11.1}	600 {6.1}	400 {4.1}	300 {3.1}	150 {1.5}	—	—
	290 {3.0}	3060 {31.2}	1920 {19.6}	1220 {12.5}	910 {9.3}	490 {5.0}	—	—
HA3D	140 {1.4}	1920 {19.6}	1060 {10.8}	720 {7.4}	540 {5.5}	250 {2.6}	120 {1.2}	—
	290 {2.8}	3920 {40.0}	3400 {34.7}	2170 {22.1}	1620 {16.5}	870 {8.9}	390 {4.0}	—
		5390 {55.0}						
HA4D	140 {1.4}	—	—	1240 {12.7}	930 {9.5}	450 {4.6}	200 {2.1}	150 {1.5}
	290 {3.0}	—	—	3750 {38.2}	2790 {28.5}	1520 {15.5}	680 {6.9}	460 {4.7}
VA5D	140 {1.4}	—	—	—	—	—	280 {2.9}	200 {2.1}
	290 {3.0}	—	—	—	—	—	850 {8.7}	580 {5.9}
Spring range kPa {kgf/cm ² }		20 to 51 {0.2 to 0.52}	20 to 61 {0.2 to 0.62}	20 to 59 {0.2 to 0.6}	20 to 59 {0.2 to 0.6}	20 to 72 {0.2 to 0.73}	20 to 67 {0.2 to 0.68}	20 to 72 {0.2 to 0.73}

Table 13 Air-to-open

Actuator Model No.	Supply pressure kPa {kgf/cm ² }	Initial spring compression kPa {kgf/cm ² }	Differential pressure (by port size (inches)) kPa {kgf/cm ² }						
			1½	2	2½	3	4	6	8
HA1R	140 {1.4}	20 {0.2}	110 {1.1}	70 {0.7}	—	—	—	—	—
	270 {2.8}	80 {0.8}	490 {5.0}	310 {3.2}	—	—	—	—	—
HA2R	140 {1.4}	20 {0.2}	240 {2.5}	170 {1.7}	98 {1.0}	80 {0.8}	40 {0.4}	—	—
	270 {2.8}	80 {0.8}	981 {10.0}	640 {6.5}	400 {4.1}	300 {3.1}	180 {1.8}	—	—
HA3R	140 {1.4}	20 {0.2}	440 {4.5}	290 {3.0}	180 {1.8}	140 {1.4}	80 {0.8}	30 {0.3}	—
	270 {2.8}	80 {0.8}	1740 {17.8}	1170 {11.9}	720 {7.4}	540 {5.5}	300 {3.1}	140 {1.4}	—
HA4R	140 {1.4}	20 {0.2}	—	—	310 {3.2}	240 {2.4}	140 {1.4}	60 {0.6}	40 {0.4}
	270 {2.8}	80 {0.8}	—	—	1240 {12.7}	930 {9.5}	530 {5.4}	240 {2.4}	160 {1.6}
VA5R	140 {1.4}	20 {0.2}	—	—	—	—	190 {1.9}	80 {0.8}	50 {0.5}
	270 {2.8}	80 {0.8}	—	—	—	—	720 {7.4}	320 {3.3}	220 {2.2}
PSA6R	500 {5.0}	200 {2.0}	—	—	—	—	1410 {14.4}	620 {6.3}	—

Note) Columns bordered with solid lines("□") denote types provided with standard-type actuator

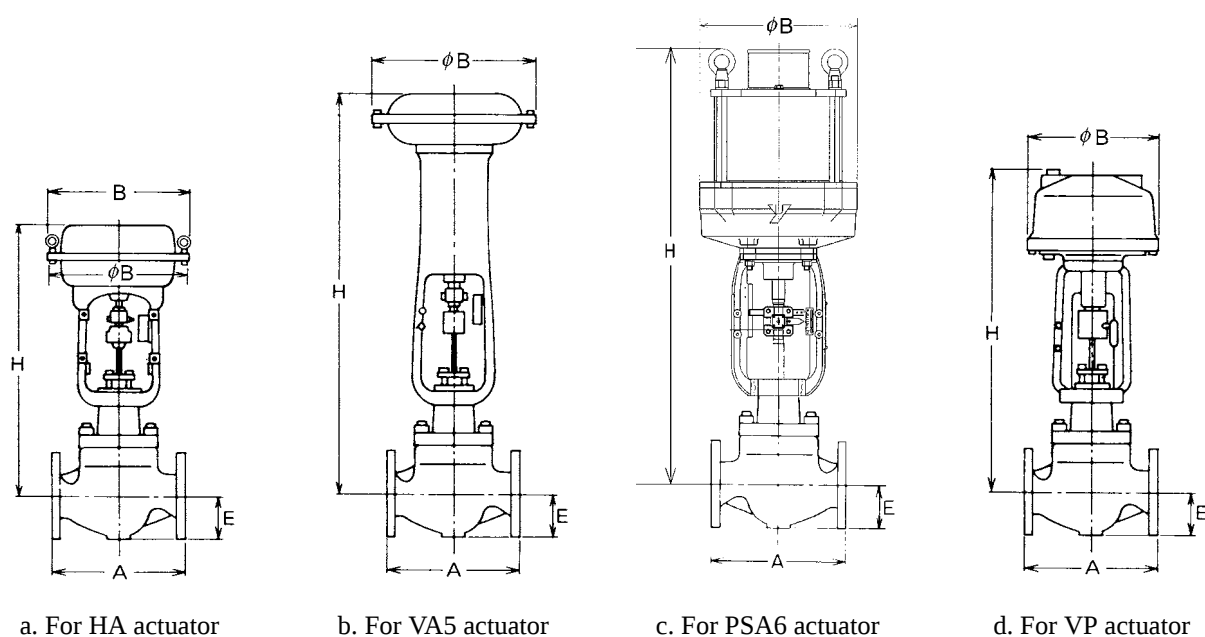
DIMENSIONS**Table 14 Face-to-face dimensions**

[Unit: mm]

Normal size (inches)	A							
	JIS 10KFF, 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 JIS 16K Male and female	JIS 20K Tongue and groove JIS 20K Male and female	JIS 30K Tongue and groove JIS 30K Male and female	JIS 40K Tongue and groove JIS 4K 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

Normal size (inches)	A						
	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 IEC534-3-1976 Standard.

**Figure 6 Face-to-face and external dimensions**

DIMENSIONS**Table 15 External dimensions**

[Unit: mm]

Nominal size (inches)	Actuator Model No.	H					B	ø B	E
		Plain bonnet	Extension bonnet Type 1	Extended bonnet Type 2		Bellow type bonnet			
				Integral-cast	Welded type				
1½	HA1D, R	425	590	705	945	585	230	218	70
	HA2D, R	500	665	780	1020	660	281	267	
	HA3D, R	590	760	875	1140	810	363	350	
2	HA1D, R	425	595	710	950	585	230	218	80
	HA2D, R	500	670	785	1025	660	281	267	
	HA3D, R	595	765	875	1140	810	363	350	
2½	HA2D, R	575	745/755	880	1130	795	281	267	88
	HA3D, R	630	800/810	930	1180	850	363	350	
	HA4D, R	865	1035/1045	1165	1495	-	520	470	
3	HA2D, R	580	755/765	900	1135	800	281	267	98
	HA3D, R	635	810/820	955	1190	855	363	350	
	HA4D, R	870	1045/1055	1190	1505	-	520	470	
4	HA2D, R	610	810/820	915	1150	830	281	267	113
	HA3D, R	660	860/870	1020	1205	880	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	1075	363	350	170
	HA4D, R	955	1190/1215	1425	1570	1245	520	470	
	VA5D	1360	1620	1870	2000	-	-	620	
	VA5R	1480	1740	1980	2110	-	-	620	
	PSA6R	1315	1575	1815	1945	-	-	476	
	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	1340	520	470	220
	VA5D	1475	1740	2025	2155	1785	-	620	
	VA5R	1585	1850	2145	2275	-	-	620	
	PSA6R	1735	2000	2295	2425	-	-	476	
	VP5	1165	1425	1665	1795	-	-	345	
	VP6	1375	1635	1875	2005	-	-	445	
	VP7	1455	1715	1955	2085	-	-	545	

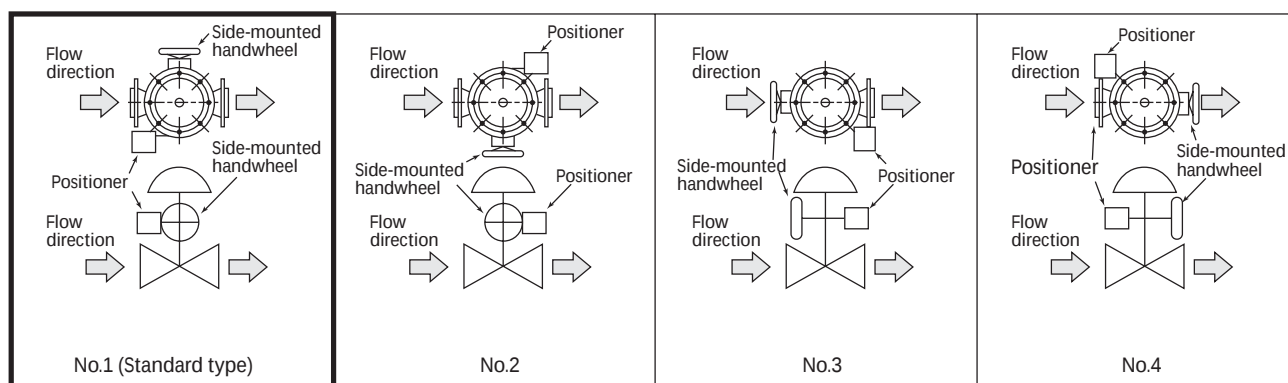
Note) 1) “H” dimensions are applicable when a handwheel is not provided. When top-mounted handwheel HA or VA actuators or side-mounted handwheel PSA6R or VP actuators are used, add the handwheel dimensions designated in respective specification sheets (No.SS2-8213-0500 for Type HA actuators; No.SS2-8210-0100 and SS2-PSA100-0100 for Type VA, PSA actuators; No.SS2-8210-0300 for Type VP 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.

Table 16 Weight

[Unit: kg]

Nominal size (inches)	Actuator Model No.	Weight															
		Nominal type ANSI 150, JIS10K, JPI 150				Flanged type ANSI 300, JIS16K, 20K, 30K JPI300				Flanged type ANSI 600, JIS40K, JPI600				Welded type ANSI 150, 300, 600, JIS 10K, 16K, 20K, 30K JPI 150, 300, 600			
		Plain	Extension type 1 bellows Type	Extension type 2		Plain	Extension type 1 bellows Type	Extension type 2		Plain	Extension type 1 bellows Type	Extension type 2		Plain	Extension type 1 bellows Type	Extension type 2	
				Integral- cast	Welded type			Integral- cast	Welded type			Integral- cast	Welded type			Integral- cast	Welded type
1½	HA1D, 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	HA1D, 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
2½	HA2D, 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	HA2D, 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	HA2D, 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	213	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
	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
	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 7 Actuator orientation**

- Note) 1. Indicated by position number when installation other than by the standard type is required.
 2. Type HA1 actuator is provided with the top-mounted handwheel only.
 3. With type PSA6R actuator, the side-mounted handwheel is mounted on the same side as the positioner.

Ordering information

When ordering, please specify;

- 1) Model number: HTS
- 2) Nominal size × 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 pressure to diaphragm
- 8) Valve action (direct or reverse)
- 9) Accessories (positioner, handwheel, pressure regulator with filter and etc.)
- 10) Special requirement of degreasing, copper free treatment, 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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