

Cage type Single Seated Control Valves

Model HSC_ _ _

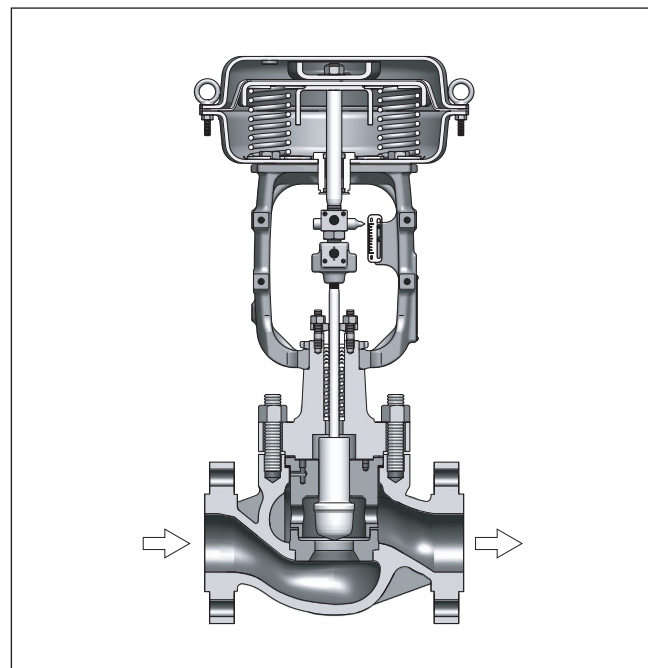
OVERVIEW

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.

Model HSC is compliant to Functional Safety Standard (IEC61508).



SPECIFICATIONS

Body

Type

Straight through, cast globe valve

Nominal size

1-1/2, 2, 2-1/2, 3, 4, 6, 8 inches

Pressure rating and End connection

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 (2-1/2 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	
	230 to 566 °C	
Extension bonnet Type 2	-100 to -45 °C	Integral-cast type
	-196 to -100 °C	Welded type
Bellows type	-50 to +350 °C	Formed or welded bellows (Detail is showing in Figure 4)

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: Polytetrafluoroethylene

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**

Actuator type	Actuator model
Single acting diaphragm actuator	PSA1
	HA_ _
	VA5_
Spring type piston actuator	PSA6R
Double acting piston actuator	DAP_ _ _

Diaphragm

Actuator model	Diaphragm material
PSA1_ , HA_ _	Cloth embedded ethylene propylene rubber
VA5_	Cloth-chloroprene rubber

Spring range

Actuator model	Spring range
PSA1_	20 to 98 kPa {0.2 to 1.0 kgf/cm ² }
HA_ _	80 to 240 kPa {0.8 to 2.4 kgf/cm ² }
VA5_	
PSA6R	200 to 340 kPa {2.0 to 3.5 kgf/cm ² } 200 to 390 kPa {2.0 to 4.0 kgf/cm ² }
PSA7R	200 to 270 kPa {2.0 to 2.8 kgf/cm ² } 200 to 305 kPa {2.0 to 3.0 kgf/cm ² }

Supply pressure

Actuator model	Supply pressure
PSA1_	120 to 390 kPa {1.2 to 4.0 kgf/cm ² }
HA_ _	
VA5_	120 to 270 kPa {1.2 to 2.8 kgf/cm ² }
PSA6R	400 to 500 kPa {4.0 to 5.0 kgf/cm ² }
PSA7R	400 kPa {4.0 kgf/cm ² }
DAP_ _ _	290 to 490 kPa {3.0 to 5.0 kgf/cm ² }

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

Air connection

Actuator model	Connection
PSA1_ or HA_ _	Rc1/4 or 1/4NPT internal thread
PSA6R or PSA7R	Rc1/4 or 1/4NPT internal thread Rc3/8 or 3/8NPT internal thread
VA5_ or DAP_ _ _	Rc1/2 or 1/2NPT internal thread

Note) With type VA or DAP, 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.
3. Vinyl-coated copper pipes are normally used for air piping. If the ambient temperature may be -15 °C or lower or +60 °C or higher, stainless steel pipes are recommended.

Actuator model	Positioner		Hand wheel	
	P/P	I/P	Top	Side
PSA1	VPE_ _ _		Mounted	Mounted
HA2 - 4	HTP- _ _			
VA5				
PSA6	HTP- _ _	AVP2_ _	-	Mounted
	VPP_ _ _	AVP3_ _		
PSA7		AVP7_ _		
DAP560	VPP_ _ _			Mounted (Hydraulic)
DAP1000				
DAP1500				

Functional Safety Standard (IEC61508) conformity:

SIL3 capable - certified by exida Consulting LLC

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 7 to Table 15.

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.

Dimensions

Refer to Figure 7, Table 16 and Table 17.

Weight

Refer to Table 18.

Actuator orientation

Refer to Figure 8.

Finish

Blue or silver, or other specified colors.

Hysteresis error

Actuator model	PSA1_	HA__ or DAP__	PSA6R or PSA7R
Without positioner	±5% F.S	±3% F.S	±9% F.S
With positioner	±1% F.S	±1% F.S	±2% F.S

Linearity

Actuator model	PSA1_	HA__ or DAP__	PSA6R or PSA7R
Without positioner	±5% F.S	±5% F.S	±9% F.S
With positioner	VPE__ - : ±3% F.S AVP__ : ±2% F.S	±1% F.S	±2% F.S

Note) When positioner is not provided, operating performance may vary depending on types of packings used.

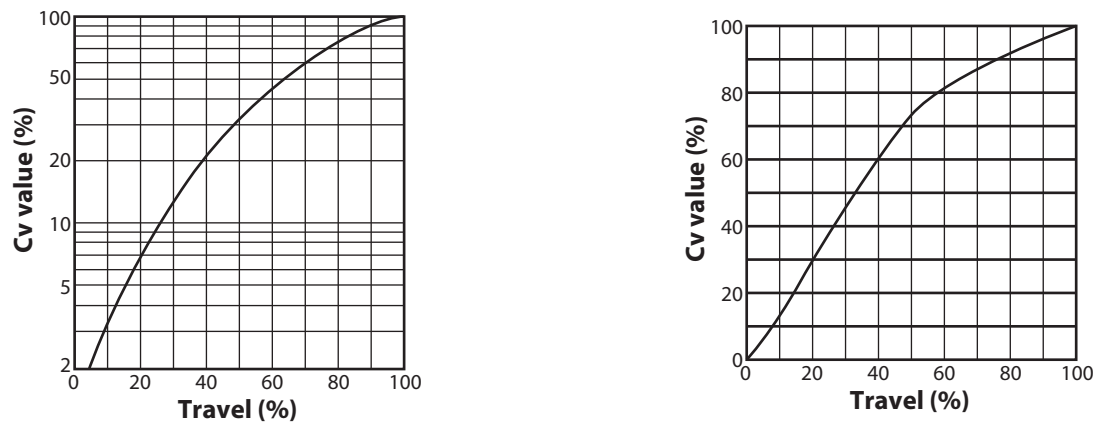
Table 1. Body / trim metal combinations and operating temperature ranges (°C)

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	SUS316 CoCr-A seat or SCS14A CoCr-A seat		-5 to +425	-5 to +550	-5 to +566	-	-196 to +550	-196 to +550	-	-
JIS	SUS316 CoCr-A face or SCS14A CoCr-A face		-5 to +425	-5 to +550	-5 to +566	-	-196 to +550	-196 to +550	-	-
JIS	SUS316L CoCr-A seat or SCS16A CoCr-A seat		-	-	-	-	-196 to +450	-196 to +450	-196 to +450	-196 to +450
JIS	SUS329J1 CoCr-A seat or SCS11 CoCr-A seat		-	-	-	-50 to +550	-	-196 to +550	-	-

Note) 1. SUS440C is recommended for valves for cavitation/flushing service of water or for superheated service of water higher than 100 °C.

Table 2. Cv value and travel

Nominal size (inches)	1-1/2			3			2-1/2			3			4			6			8		
Port size (Cv value or inches)	Cv= 4.0	Cv= 6.3	1	Cv= 6.3	1	1-1/4	1	1-1/4	1-1/2	1-1/4	1-1/2	2	1-1/2	2	2-1/2	2-1/2	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**Table 3. Gland packing**

According to your application, select appropriate type of gland packing from the following:

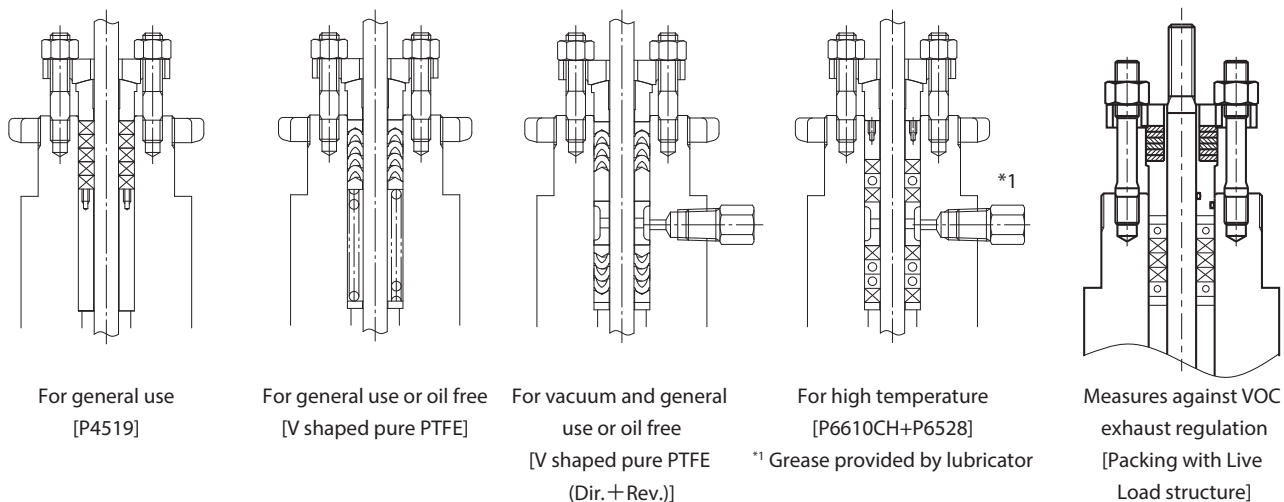
Application	Packing Type	Fluid temperature range
		Maximum working pressure
General use (Various chemical, acid and alkali)	PTFE fiber yarn packing with carbon fiber core packing [P4519]	-17 to +230 °C 10MPa Max.
General use or oil free (Various chemical, acid and alkali)	V shaped pure PTFE packing [Pure PTFE]	-196 to +230 °C 10MPa Max.
Vacuum and General use or oil free (Various chemical, acid and alkali)	V shaped pure PTFE packing (Dir. + Rev.) [Pure PTFE (Dir. + Rev.)]	-196 to +230 °C 10MPa Max.
Low or standard temperature (Various chemical, acid and alkali, LNG, etc.)	V shaped pure PTFE packing + PTFE fiber yarn packing or PTFE braided packing [Pure PTFE +PTFE fiber]	-196 to +230 °C 10MPa Max.
High temperature	Expanded graphite packing + Expanded graphite yarn packing *1 [P6610CH+P6528]	+230 to +500 °C 43MPa Max.
	Expanded graphite packing + Carbon fiber reinforced expanded graphite packing *1 [P6610CH+M8590]	+500 to +566 °C 43MPa MAX.
Measures against VOC *2 exhaust regulation [ISO15848-1 compliant low emission packing system]	Packing with Live Load structure *3	-17 to +350 °C 15.5 MPa Max.

*1. Grease provided

It cannot be applied to PSA1 actuator (spring range 20 to 98 kPa).

*2. Volatile Organic Compound

*3. Refer to special spec sheet No.SS2-SSL100-0100 about detail of Low emission gland packing.

**Figure 2. Gland Packing structure**

Structural drawing of trim and body/trim material combinations

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

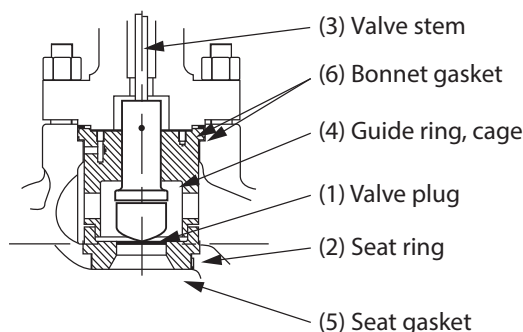


Figure 3. Structural drawing of trim

Table 4. The valve body material is carbon steel (SCPH2/A216WCB).

(1) Valve plug (2) Seat ring	SUS440C	SUS316 CoCr-A or SCS14A CoCr-A seat SUS316 CoCr-A face or SCS14A CoCr-A face	
		General	Oil-free
(3) Valve stem	SUS316		
(4) Guide ring, cage	SUS440C	Same as valve plug and seat ring	
(5) Seat gasket	Without	SUS316(PTFE coating)	
(6) Bonnet gasket	SUS316	SUS316(PTFE coating)	

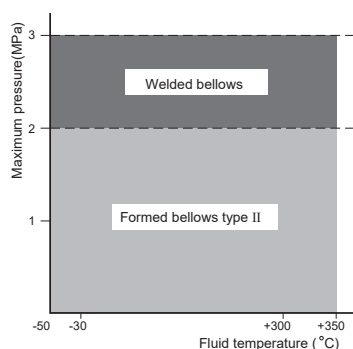


Figure 4. Bellows Type by Temperature and Pressure Ranges

Note) Bellows type are classified into Formed bellows type II and welded bellows by temperature and pressure ranges.
Please refer to No. SS2-BSL100-0100 about detail of bellows specification.

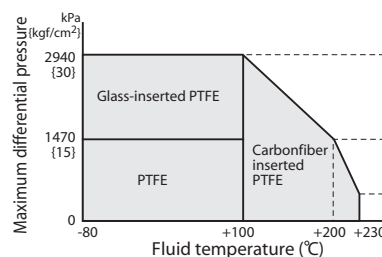


Figure 5. Temperature and maximum differential pressure range of soft-seat type

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

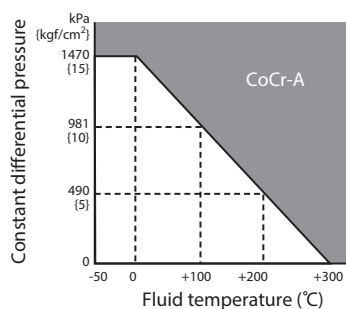


Figure 6. Temperature/normal differential pressure ranges requiring CoCr-A

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

Table 5. The valve body material is stainless steel (SCS13A/A351CF8)

(1) Valve plug (2) Seat ring	SUS316 CoCr-A seat or SCS14A CoCr-A seat SUS316 CoCr-A face or SCS14A CoCr-A face	
	General	Oil-free
(3) Valve stem	SUS316	
(4) Guide ring, cage	Same as valve plug and seat ring	
(5) Seat gasket	Without	SUS316(PTFE coating)
(6) Bonnet gasket	SUS316	SUS316(PTFE coating)

Table 6. The valve body material is stainless steel (SCS14A/A351CF8M)

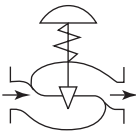
(1) Valve plug (2) Seat ring	SUS316 CoCr-A seat or SCS14A CoCr-A seat SUS316 CoCr-A face or SCS14A CoCr-A face	
	General	Oil-free
(3) Valve stem	SUS316	
(4) Guide ring, cage	SUS316 CoCr-A	
(5) Seat gasket	Without	SUS316(PTFE coating)
(6) Bonnet gasket	SUS316	SUS316(PTFE coating)

Allowable differential pressure

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

Valves with model PSA1, HA or VA actuator

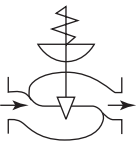
Table 7. Air-to-close

Actuator Model	Supply pressure kPa{kgf/cm ² }	Spring range kPa{kgf/cm ² }	Differential pressure kPa {kgf/cm ² }																	
			1-1/2			2			2-1/2			3			4			6		
			Cv =4.0	Cv =6.3	1	Cv =6.3	1	1-1/4	1	1-1/4	1-1/2	1-1/4	1-1/4	2	1-1/4	2	2-1/4	2-1/4	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}	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}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	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}	3920 {40.0}	3100 {31.6}	3920 {40.0}	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}	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}	2130 {21.7}	3920 {40.0}	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}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3350 {34.2}	3920 {40.0}	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}	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}	3920 {40.0}	3920 {40.0}	2600 {26.5}	2600 {26.5}	1830 {18.7}	1030 {10.5}

Actuator Model	Supply pressure kPa{kgf/cm ² }	Spring range kPa{kgf/cm ² }	Differential pressure kPa {kgf/cm ² }														
			2-1/2			3			4			6			8		
			1	1-1/4	1-1/2	1-1/4	1-1/2	2	1-1/2	2	2-1/2	2-1/2	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}	3920 {40.0}	3920 {40.0}	3920 {40.0}	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}
			9410 {96.0}	5780 {59.0}	40.0	5780 {59.0}	40.0	24.2	40.0	24.2	15.2	15.2	10.7	6.1	10.7	6.1	3.9
	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}	3920 {40.0}	3920 {40.0}	3160 {32.0}	1780 {18.2}	3160 {32.2}	1780 {18.2}	1140 {11.6}
			9810 {100}	9810 {100}	9810 {100}	9810 {100}	9810 {100}	7060 {72.0}	9810 {100}	7060 {72.0}	4410 {45.0}	4410 {45.0}					
	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}
160 {1.6}		20 to 98 {0.2 to 1.0}	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 {14.7}	810 {8.3}	1440 {14.7}	810 {8.3}	810 {8.3}
			9810 {100}	7840 {80.0}	5590 {57.0}	7840 {80.0}	5590 {57.0}		5590 {57.0}								

Valves with model PSA, HA or VA actuator

Table 8. Air-to-open

Actuator Model	Supply pressure kPa {Kgf/cm ² }	Spring range kPa {Kgf/cm ² }	Differential pressure (Upper side: by nominal size, Lower side: by port size) kPa {Kgf/cm ² }																	
			1-1/2			2			2-1/2			3			4			6		
			Cv =4.0	Cv =6.3	1	Cv =6.3	1	1-1/4	1	1-1/4	1-1/2	1-1/4	1-1/4	2	1-1/4	2	2-1/4	2-1/4	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}	3920 {40.0}	3920 {40.0}	3920 {40.0}	2650 {27.0}	3920 {40.0}	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}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3330 {34.0}	3920 {40.0}	3330 {34.0}	1920 {19.6}	3330 {34.0}	1920 {19.6}	1210 {12.3}	1210 {12.3}	850 {8.7}	480 {4.9}

Actuator Model	Supply pressure kPa {Kgf/cm ² }	Spring range kPa {Kgf/cm ² }	Differential pressure (Upper side: by nominal size, Lower side: by port size) kPa {Kgf/cm ² }														
			2-1/2			3			4			6			8		
			1	1-1/4	1-1/2	1-1/4	1-1/2	2	1-1/2	2	2-1/2	2-1/2	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}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3090 {31.5}	3920 {40.0}	3090 {31.5}	2090 {21.3}	2090 {21.3}	1470 {15.0}	830 {8.5}	1470 {15.0}	830 {8.5}	530 {5.4}
			9810 {100}	8040 {82.0}	5690 {58.0}	8040 {82.0}	5690 {58.0}		5690 {58.0}								
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}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	2860 {29.2}	2860 {29.2}	2020 {20.6}	1140 {11.6}	2020 {20.6}	1140 {11.6}	720 {7.4}
			9810 {100}	9810 {100}	7840 {80.0}	9810 {100}	7840 {80.0}	4510 {46.0}	7840 {80.0}	4510 {46.0}							
PSA6R	400 {4.0}	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}	9810 {100}	5980 {61.0}						
	500 {5.0}	200 to 390 {2.0 to 4.0}	—	—	—	—	—	—	—	—	—	—	3920 {40.0}	3920 {40.0}	2370 {24.2}	—	—
												5980 {61.0}	4220 {43.0}				

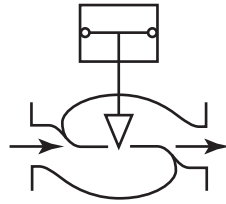
Note) 1. Take care not to cause the maximum allowable differential pressure to exceed the maximum operating pressure designated by ANSI B16. 34-1981 or JIS B2201-1984.

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

Valves with model DAP actuator

Table 9. Air-to-close and Air-to-open

Actuator Model	Supply Pressure kPa{Kg/cm ² }	Differential pressure (Upper side: by nominal size, Lower side: by port size) kPa {Kg/cm ² }														
		2-1/2			3			4			6			8		
		1	1-1/4	1-1/2	1-1/4	1-1/2	2	1-1/2	2	2-1/2	2-1/2	3	4	3	4	5
DAP 560	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 {27.8}	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 {48.0}		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}	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}		
DAP 1000	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 {48.0}	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}	40.0 {40.0}
DAP 1500	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}

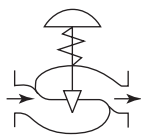
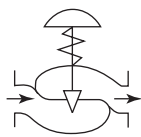


- Note)
1. When a backup system for pressure drop at the air source is used, select the allowable differential pressure from whichever is lower constant supplied air pressure or backup system set pressure (trip pressure).
 2. Take care not to cause the maximum allowable differential pressure to exceed 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 model HA or VA actuator

Table 10. Air-to-close

Actuator Model	Supply pressure kPa{kgf/cm ² }	Spring range kPa{kgf/cm ² }	Differential pressure kPa {kgf/cm ² }																				
			1-1/2			2			2-1/2			3			4			6			8		
			Cv =4.0	Cv =6.3	1	Cv =6.3	1	1-1/4	1	1-1/4	1-1/2	1-1/4	1-1/2	2	1-1/2	2	2-1/2	2-1/4	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	3920 {40.0}	3920	3380	3920	3380	1950	3380	1950	1230	—	—	—	—	—	—
			9810 {100}	9810 {100}	7830 {79.8}	9810 {100}	7830 {79.8}	—	7830 {79.8}	—	{34.4}	{40.0}	{34.4}	{19.8}	{34.4}	{19.8}	{12.5}	—	—	—	—	—	—
			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}	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}	{35.3}	6010 {61.2}	6010 {61.2}	2180 {22.2}	1540 {15.7}	860 {8.7}	—	—	—		
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}	{39.3}	3860 {39.3}	2720 {27.7}	1530 {15.6}	2720 {27.7}	1530 {15.6}	980 {9.9}	
	—	—	—					—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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}
			—					—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

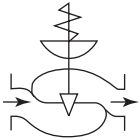
Note) 1. Take care not to cause the maximum allowable differential pressure to exceed the maximum operating pressure designated by ANSI B 16. 34-1981 or JIS B2201-1984.

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

Valves with model PSA, HA or VA actuator

Table 11. Air-to-open

Actuator Model	Supply pressure kPa{kgf/cm ² }	Spring range kPa{kgf/cm ² }	Differential pressure kPa {kgf/cm ² }																	
			1-1/2			2			2-1/2			3			4			6		
			Cv =4.0	Cv =6.3	1	Cv =6.3	1	1-1/4	1	1-1/4	1-1/2	1-1/4	1-1/2	2	1-1/2	2	2-1/2	2-1/4	3	4
HA2R	270 {2.8}	80 to 240 {0.8 to 2.4}	3920 {40.0}	3920 {40.0}	3410	3920 {40.0}	3410	2080	3410	2080	1470	2080	1470	850	1470	850	530	—	—	—
			9810 {100}	5900 {60.1}	{34.7}	5900 {60.1}	{34.7}	{21.2}	{34.7}	{21.2}	{14.9}	{21.2}	{14.9}	{8.6}	{14.9}	{8.6}	{5.4}	—	—	—
HA3R			3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3690	3920 {40.0}	3690	2610	3690	2610	1510	2610	1510	950	950	670	370
			9810 {100}	9810 {100}	6050 {61.6}	9810 {100}	6050 {61.6}	{37.6}	6050 {61.6}	{37.6}	{26.6}	{37.6}	{26.6}	{15.3}	{26.6}	{15.3}	{9.6}	{9.6}	{6.8}	{3.7}

Actuator Model	Supply pressure kPa{kgf/cm ² }	Spring range kPa{kgf/cm ² }	Differential pressure kPa {kgf/cm ² }														
			2-1/2			3			4			6			8		
			1	1-1/4	1-1/2	1-1/4	1-1/2	2	1-1/2	2	2-1/2	2-1/4	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	3920 {40.0}	2750	1730	1730	1220	680	1220	680	440
			9810 {100}	6720 {68.5}	4770 {48.6}	6720 {68.5}	4770 {48.6}	{28.0}	4770 {48.6}	{28.0}	{17.6}	{17.6}	{12.4}	{6.9}	{12.4}	{6.9}	{4.4}
VA5R			3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3570	3920 {40.0}	3570	2250	2250	1580	890	1580	890	570
			9810 {100}	8720 {88.9}	6180 {63.0}	8720 {88.9}	6180 {63.0}	{36.4}	6180 {63.0}	{36.4}	{22.9}	{22.9}	{16.1}	{9.0}	{16.1}	{9.0}	{5.8}
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}	—	—	—	—
PSA7R	400 {4.0}*3	200 to 340 {2.0 to 3.5}	—	—						—	—	—	—	—	3920 {40.0}	2370 {24.1}	1520 {15.5}
	400 {4.0}*2	200 to 270 {2.0 to 2.8}	—	—						—	—	—	3920 {40.0}	3920 {40.0}	—	—	—
			—	—						—	—	—	9810 {100}	7110 {72.5}	4000 {40.7}	—	—
PSA7R	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}	—

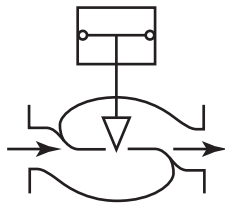
- Note) 1. Take care not to cause the maximum allowable differential pressure to exceed the maximum operating pressure designated by ANSI B 16. 34-1981 or JIS B2201-1984.
2. The upper figures denote the operating allowable differential pressure. The lower denote allowable differential pressure at full closure.
3. *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 model DAP actuator

Table 12. Air-to-close and Air-to-open

Actuator Model	Supply pressure kPa{kgf/cm ² }	Differential pressure kPa {kgf/cm ² }														
		2-1/2			3			4			6			8		
		1	1-1/4	1-1/2	1-1/4	1-1/2	2	1-1/2	2	2-1/2	2-1/4	3	4	3	4	5
DAP 560	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}		
DAP 1000	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}	
DAP 1500	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}

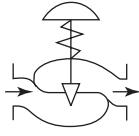
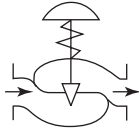


- Note) 1. When a backup system for pressure drop at the air source is used, select the allowable differential pressure from whichever is lower constant supplied air pressure or backup system set pressure (trip pressure).
2. Take care not to cause the maximum allowable differential pressure to exceed 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 model HA or VA actuator

Table 13. Air-to-close

Actuator Model	Supply pressure kPa{Kgf/cm ² }	Spring range kPa{Kgf/cm ² }	Differential pressure kPa {kgf/cm ² }																							
			1-1/2			2			2-1/2			3			4			6			8					
			Cv =4.0	Cv =6.3	1	Cv =6.3	1	1-1/4	1	1-1/4	1-1/2	1-1/4	1-1/2	2	1-1/2	2	2-1/2	2-1/4	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}	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}	—	—	—	—	—	—	—	—	—	—				
			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}	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}	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}	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.

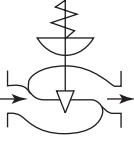
2. Take care not to cause the maximum allowable differential pressure to exceed the maximum operating pressure designated by ANSI B 16. 34-1981 or JIS B2201-1984.

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

Valves with model PSA, HA or VA actuator

Table 14. Air-to-open

Actuator Model	Supply pressure kPa{kgf/cm ² }	Spring range kPa{kgf/cm ² }	Differential pressure kPa {kgf/cm ² }																	
			1-1/2			2			2-1/2			3			4			6		
			Cv =4.0	Cv =6.3	1	Cv =6.3	1	1-1/4	1	1-1/4	1-1/2	1-1/4	1-1/2	2	1-1/2	2	2-1/2	2-1/4	3	4
HA2R	270 {2.8}	80 to 240 {0.8 to 2.4}	3920 {40.0}	3920 {40.0}	2900	3920 {40.0}	2900	1770	2900	1770	1250	1770	1250	720	1250	720	530	—	—	—
			9260 {94.4}	5020 {51.1}	{29.5}	5020 {51.1}	{29.5}	{18.0}	{29.5}	{18.0}	{12.7}	{18.0}	{12.7}	{7.3}	{12.7}	{7.3}	{5.4}	—	—	—
HA3R			3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3140	3920 {40.0}	3140	2230	3140	2230	1280	2230	1280	810	810	570	320
			9810 {100}	8920 {90.9}	5150 {52.5}	8920 {90.9}	5150 {52.5}	{32.0}	5150 {52.5}	{32.0}	{22.7}	{32.0}	{22.7}	{13.0}	{22.7}	{13.0}	{8.2}	{8.2}	{5.8}	{3.2}

Actuator Model	Supply pressure kPa{kgf/cm ² }	Spring range kPa{kgf/cm ² }	Differential pressure kPa {kgf/cm ² }														
			2-1/2			3			4			6			8		
			1	1-1/4	1-1/2	1-1/4	1-1/2	2	1-1/2	2	2-1/2	2-1/4	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	3920 {40.0}	2750	1530	1530	1080	600	1080	600	390
			9810 {100}	5950 {60.6}	4220 {43.0}	5950 {60.6}	4220 {43.0}	{24.7}	4220 {43.0}	{28.0}	{15.6}	{15.6}	{11.0}	{6.1}	{11.0}	{6.1}	{3.9}
VA5R			3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3040	3920 {40.0}	3040	1910	1910	1350	760	1350	760	480
			9810 {100}	7430 {75.7}	5270 {53.7}	7430 {75.7}	5270 {53.7}	{30.9}	5270 {53.7}	{30.9}	{19.4}	{19.4}	{13.7}	{7.7}	{13.7}	{7.7}	{4.8}
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}	—	—	—	—
PSA7R	400 {4.0}*3	200 to 340 {2.0 to 3.5}	—	—						—	—	—	—	—	3920 {40.0}	2320 {23.6}	1480 {15.0}
			—	—						—	—	—	—	—	4130 {42.1}	—	—
	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}	—	—	—
PSA7R	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. 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.

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

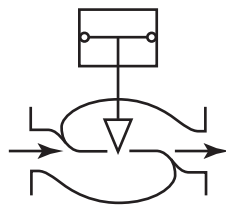
3. *1...Applicable to valve sizes of 2½ to 4 inches, *2...Applicable to valve size of 6 inches, *3...Applicable to valve size 8 inches.

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

Valves with model DAP actuator

Table 15. Air-to-close and Air-to-open

Actuator Model	Supply pressure kPa{Kgf/cm ² }	Differential pressure kPa {kgf/cm ² }														
		2-1/2			3			4			6			8		
		1	1-1/4	1-1/2	1-1/4	1-1/2	2	1-1/2	2	2-1/2	2-1/4	3	4	3	4	5
DAP 560	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}		
DAP 1000	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}	
DAP 1500	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 16. 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
1-1/2	222	231	235	251	235	236	248	251
2	254	263	267	286	265	267	276	286
2-1/2	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

(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) *
1-1/2	235	248	251	244	248	251	251
2	267	283	289	276	283	286	286
2-1/2	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 (2-1/2 inches or over)

-JIS B 2005-3-1:2005

-JIS B 2005-3-3:2005 (2-1/2 inches or over)

Table 17. External dimensions

(Unit: mm)

Nominal size (inches)	Actuator Model	H					B	φ B	E
		Plain bonnet	Extension Bonnet type 1	Extension bonnet type 2		Bellows type bonnet			
				Integral cast type	Welded type				
1-1/2	PSA1D, R	446	631	746	986	626	230	218	70
	HA2D, R	500	665	780	1020	660	281	267	
	HA3D, R	590	760	875	1140	810	363	350	
2	PSA1D, R	446	636	751	991	626	230	218	80
	HA2D, R	500	670	785	1025	660	281	267	
	HA3D, R	595	765	875	1140	810	363	350	
2-1/2	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	-	281	267	98
	HA3D, R	635	810/820	955	1190	800	363	350	
	HA4D, R	870	1045/1055	1190	1505	855	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	
	DAP560	1185	1395	-	-	-	-	380	
	DAP1000	1215	1455	-	-	-	-	470	
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	
	PSA7R	1745	2005	2245	2375	-	-	580	
	DAP560	1245	1515	-	-	-	-	380	
	DAP1000	1315	1545	-	-	-	-	470	
	DAP1500	1315	1560	-	-	-	-	570	
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	
	PSA7R	2165	2430	2725	2855	-	-	580	
	DAP560	1465	1730	-	-	-	-	380	
	DAP1000	1440	1790	-	-	-	-	470	
	DAP1500	1485	1755	-	-	-	-	570	

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 DAP 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 PSA No.SS2-DAP100-0100 for Type DAP 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.

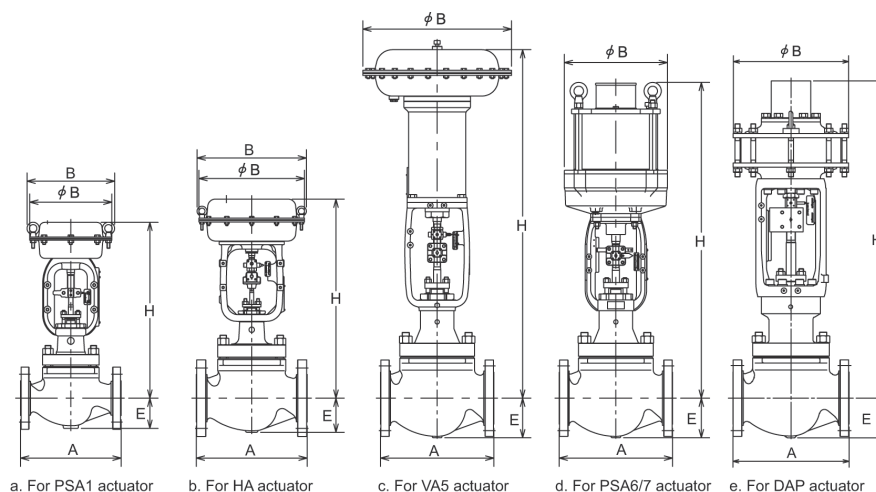


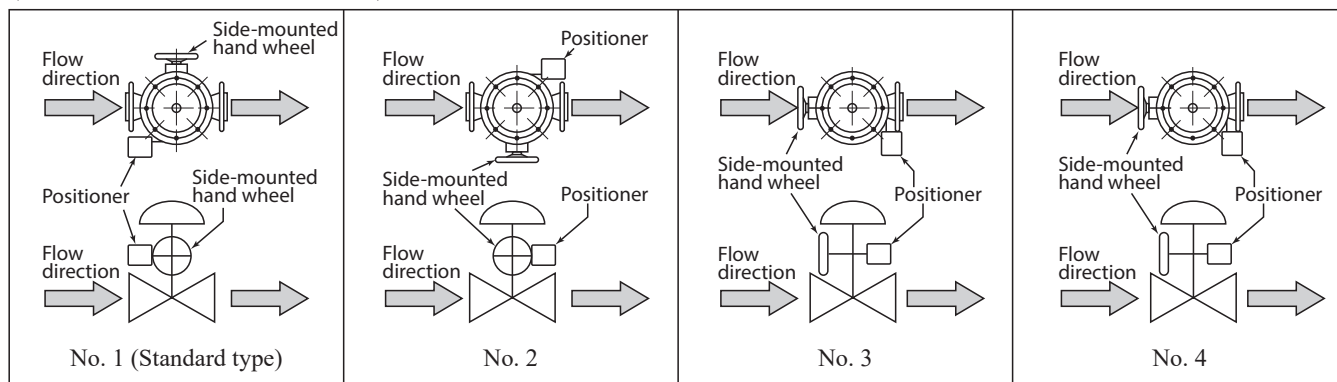
Figure 7. Face-to-face and external dimensions

Table 18. Weight

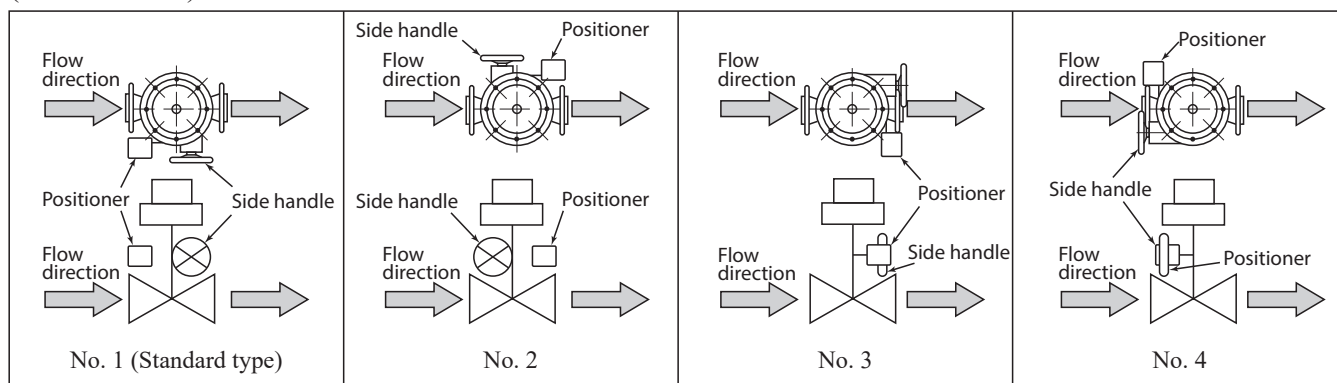
(Unit: kg)

Nominal size (inches)	Actuator Model	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	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 type	Welded type			Integral cast type	Welded type			Integral cast type	Welded type			Integral cast type	Welded type
1-1/2	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
2-1/2	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
	DAP560	208	218	-	-	223	233	-	-	258	268	-	-	220	230	-	-
	DAP1000	248	258	-	-	263	273	-	-	298	308	-	-	260	270	-	-
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
	DAP560	290	305	-	-	320	335	-	-	370	385	-	-	310	325	-	-
	DAP1000	330	345	-	-	360	375	-	-	410	425	-	-	350	365	-	-
	DAP1500	460	475	-	-	490	505	-	-	540	555	-	-	480	495	-	-
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
	DAP560	370	390	-	-	420	440	-	-	540	560	-	-	410	430	-	-
	DAP1000	410	430	-	-	460	480	-	-	580	600	-	-	450	470	-	-
	DAP1500	540	560	-	-	590	610	-	-	710	730	-	-	580	600	-	-

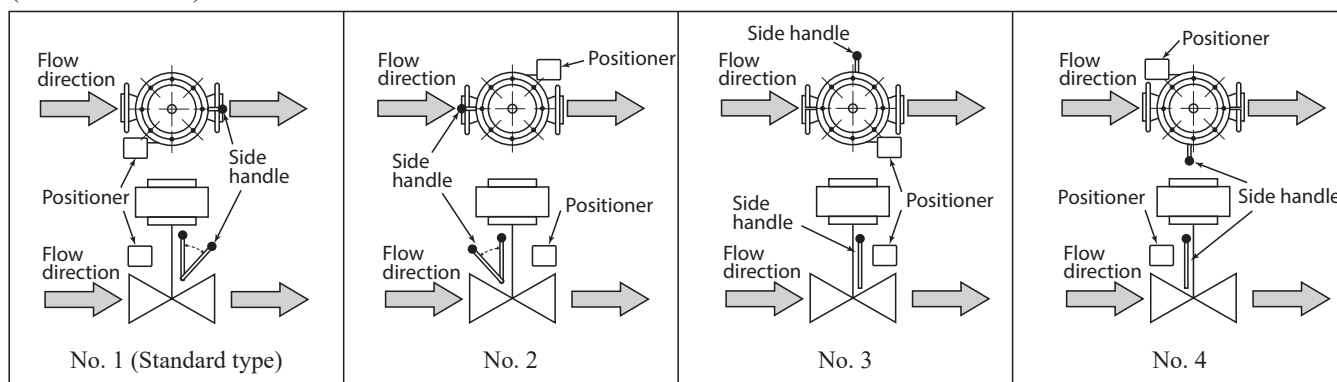
(PSA1, HA and VA5 Actuator)



(PSA Actuator)



(DAP Actuator)

**Figure 8. 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: 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

Please read "Terms and Conditions" from the following URL
before ordering and use.
<https://www.azbil.com/products/factory/order.html>

Specifications are subject to change without notice.

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