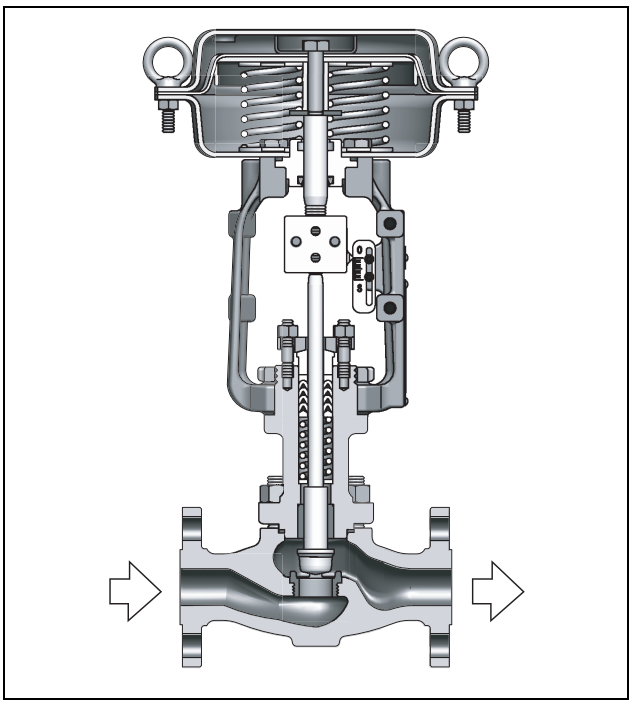
CV3000 Series
Small-Port Single Seated Control Valves
Model HLS

OVERVIEW

CV3000 Series Small-Port Single Seated Control Valves (model HLS) are designed for heavy duty service. The compact valve body, having an S-shape flow passage that features low pressure loss, allows a large flow capacity, rangeability, and high accuracy flow characteristics.

The valve plugs are available in wide range of Cv values. The flow shutoff performance complies with the IEC or JIS standards. The actuator integrated with simplest mechanisms utilizes a compact yet powerful diaphragm actuator leaded with multiple springs.

The model HLS Control Valve are widely applicable for reliable control of small flows in high or low temperature, high pressure process lines.



SPECIFICATIONS

Body

Type
Straight-through, cast globe valve

Nominal size
1/2, 3/4, 1 inch

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)
- Welded end: SW, BW
- Threaded end: Rc

Material
For combining the valve body, trim materials and the operating temperature ranges, refer to Table 1 on page 4.

Bonnet style
- Plain bonnet (-17 to 230 °C)
- Extension Type 1
  (-45 to -17 °C and 230 to 566 °C)
- Extension Type 2.
  Integral-cast type (-100 to -45 ºC)
  Welded type (-196 to -100 ºC)
- Bellows type
  (For operating temperature and pressure range, refer to Figure 2.)

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

Gland type
Bolted gland

Packing / Grease
- Crease 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, Hastelloy C, or alloy 20

Note: Sizing
When the flow rates are small, a laminar flow is formed at the vena contractra of the valve if the fluid viscosity is relatively small or the differential pressure is high.Valve capacity is defined on the assumption that the flow at the vena contracta is turbulent. For this reason, valve capacity at the vena contractra is calculated large unless the Cv value calculation formula is corrected to the logical dimensions, which may produce a valve capacity insufficient for the application.Refer to the Instrumentation Bulletin No.ID2-8000-3800 correcting Cv calculations based on fluid viscosity, and refer to No. PD2-8110-0500 for valves with such micro Cv values as 0.01, 0.04 or 0.1.

Trim

Valve plug
Single seated, Contoured type plug
- Metal seat (for flow characteristics, refer to Figure 1 on page 5.)
  Equal percentage (%CF), Linear (LCF)
- Soft seat (for flow characteristics, refer to Figure 1 on page 5.)
  Equal percentage (%TF), Linear (LTF)

Single seated, Quick-opening type plug
- Metal (Stellite) seat (QS)
  When a soft seat is required, use a contoured type soft seat.

Note) 1)For operating temperature or pressure range of soft seat, refer to Figure 3 on page 6.

2)For rated CV 0.01 to 0.1 cage guide trim

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 on page 6.

Actuator

Type
Single acting diaphragm actuator (Type HA)

Action
Direct or reverse action

Diaphragm
Cloth embedded ethylene propylene 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}

Supply pressure
120 to 390 kPa {1.2 to 4.0 kgf/cm²}

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

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

Ambient temperature
-30 to 70 ºC

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

Optional accessories (provided upon request)
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	Handwheel
	P/P	I/P	Top	Side
HA1	VPE	AVP/HEP	THM	——
HA2	HTP	AVP/HEP	THM	SHM

Additional specifications (by special order)
- Special inspection
  Flow characteristics inspection, material inspection (Material certificate), non-destructive inspection, steam inspection, low-temperature inspection
- 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 measure
- Saline damage countermeasure
- Cold-area use specification
- Tropical-area use specification
- Vacuum service

Note) For steam jacket option, refer to specification sheets No. SS2-8113-0220.

Performance

Rated Cv value

Refer to Table 2 on page 4.

Flow characteristics

Refer to Figure 1 on page 5.

Inherent rangeability

Refer to Table 2 on page 4.

- Optional; 75 : 1 for rated Cv 1.0 to 14

Allowable differential pressure

Refer to Table 3 to Table 8.

Leakage specifications

- Contoured type plug
  IEC534-4-1982 or JIS B2007-1993
  <Metal seat>
  Standard..... Class IV: Leakage less than 0.01%
  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 plug
  Leakage less than 0.00001% of maximum value

Hysteresis error

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

Linearity

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

Note) 1) When positioner is not provided, operating performance may vary depending on types of packings used.

2) Parenthesized figures are applicable to Type HA1.

Dimensions

Refer to Figure 5, Table 9 and Table 10 on page 9.

Weight

Refer to Table 11, Table 12 and Table 13 on page 10.

Actuator orientation

Refer to Figure 6 on page 11.

Finish

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

Table 1 Material combination / Temperature ranges (°C)

Body material / Trim material	JIS / ASTM	FC200 / A126Gr. B	SCPH2 / A216WCB	SCPH21 / A217WC6	SCPH61 / A217C5	SCPL1 / A352LCB	SCS11 / -	SCS13A / A351CF8	SCS14A / A351CF8M	SCS16A / A351CF3M	SCS19A / A351CF3
JIS SUS304	AISI 304	0 to 200	-5 to 300	——	——	-45 to 300	——	-196 to 300	——	——	——
JIS SUS316	AISI 316	0 to 200	-5 to 300	——	——	-45 to 300	——	-196 to 300	-196 to 300	——	——
JIS SUS304L	AISI 304L	——	——	——	——	-45 to 300	——	-196 to 300	——	——	-196 to 300
JIS SUS316L	AISI 316L	——	——	——	——	-45 to 300	——	-196 to 300	-196 to 300	-196 to 300	-196 to 300
JIS SUS440C	AISI 440C	——	-5 to 425	-5 to 425	-5 to 425	——	——	——	——	——	——
JIS SUS329J1		——	——	——	——	——	-5 to 300	——	-196 to 300	——	——
JIS SUS304 Stellite	AISI 304 Stellite	——	-5 to 425	-5 to 550	-5 to 566	-45 to 350	——	-196 to 550	——	——	——
JIS SUS304 Stellite face	AISI 304 Stellite face	——	-5 to 425	-5 to 550	-5 to 566	-45 to 350	——	-196 to 550	——	——	——
JIS SUS316 Stellite	AISI 316 Stellite	——	-5 to 425	-5 to 550	-5 to 566	-45 to 350	——	-196 to 550	-196 to 550	——	——
JIS SUS316 Stellite face	AISI 316 Stellite face	——	-5 to 425	-5 to 550	-5 to 566	-45 to 350	——	-196 to 550	-196 to 550	——	——
JIS SUS304L Stellite	AISI 304L Stellite	——	——	——	——	-45 to 350	——	-196 to 550	——	——	-196 to 450
JIS SUS316L Stellite	AISI 316L Stellite	——	——	——	——	-45 to 350	——	-196 to 450	-196 to 450	-196 to 450	-196 to 450
JIS SUS329J1 Stellite		——	——	——	——	——	-50 to 550	——	-196 to 550	——	——
JIS SUS304 Soft seat	AISI 304 Soft seat	0 to 200	-5 to 230	——	——	-45 to 230	——	-80 to 230	——	——	——
JIS SUS316 Soft seat	AISI 316 Soft seat	0 to 200	-5 to 230	——	——	-45 to 230	——	-80 to 230	-80 to 230	——	——
JIS SUS316L Soft seat	AISI 316L Soft seat	——	——	——	——	-45 to 230	——	-80 to 230	-80 to 230	-80 to 230	-80 to 230
JIS SUS329J1 Soft seat		——	——	——	——	——	-50 to 230	——	-80 to 230	——	——

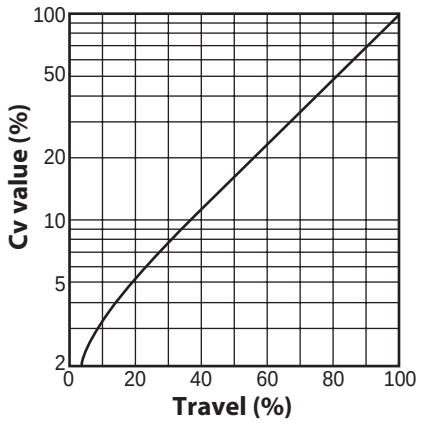
Body material / Trim material	JIS / ASTM	SCPH2 / A216WCB	SCS13A / A351CF8	SCS14A / A351CF8M	SCS16A / A351CF3M	SCS19A / A351CF3	Titanium	Hastelloy C	Alloy 20
JIS Titanium alloy		——	——	——	——	——	-196 to 315	——	——
JIS Titanium		——	——	——	——	——	-196 to 315	——	——
JIS Hastelloy C		——	——	——	——	——	——	-196 to 450	——
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) " ▭ " shows standard combination of value body and trim materials.
2) Those complying ASTM Regulation show JIS equivalents.

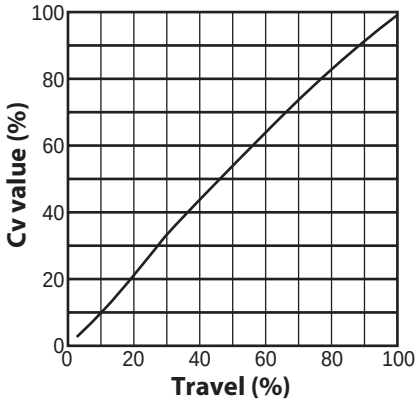
Table 2 Cv value and travel

Plug type/ characteristics / Rated travel (mm) / Rated Cv value				0.01	0.04	0.1	0.16	0.25	0.4	0.63	1.0	1.6	2.5	4.0	6.3	10	14
Contoured type	Metal seat	Equal percentage (%CF)	14.3					✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
		Linear (LCF)		✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
	Soft seat	Equal percentage (%TF)						✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
		Linear (LTF)					✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
Quick-opening type	Metal (Stellite) seat (QS)		6.0													✔	✔
Inherent rangeability				20:1	25:1		20:1			30:1	50:1						
Nominal size (inch)	1/2 inch			◄———	———	———	———	———	———	———	———	———	———	———	———		
	3/4 inch			◄———	———	———	———	———	———	———	———	———	———	———	———►		
	1 inch			◄———	———	———	———	———	———	———	———	———	———	———	———►		

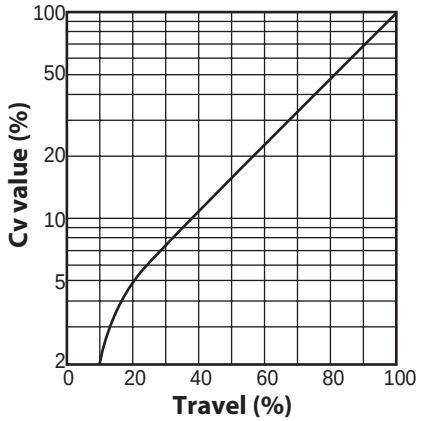
Note) " ✔ " denotes production ranges.



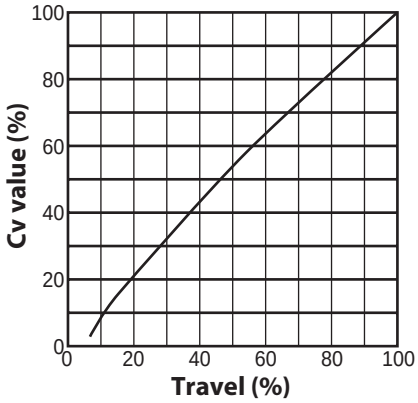
a. Equal percentage characteristics (%CF Metal seat)



b. Linear characteristics (LCF Metal seat)



c. Equal percentage characteristics (%TF Soft seat)



d. Linear characteristics (LTF Soft seat)

Figure 1 Flow characteristics: Contoured type (Cv valve: 0.4 to 1.4)

Note) The above graphs indicate typical flow characteristics.

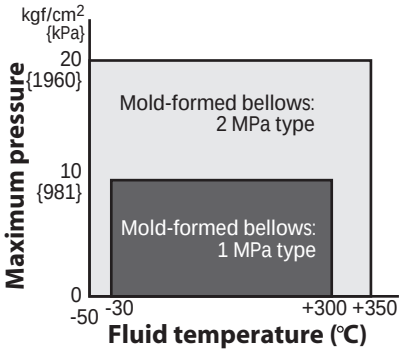


Figure 2 Operating temperature and pressure range bellows seal type bonnet

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

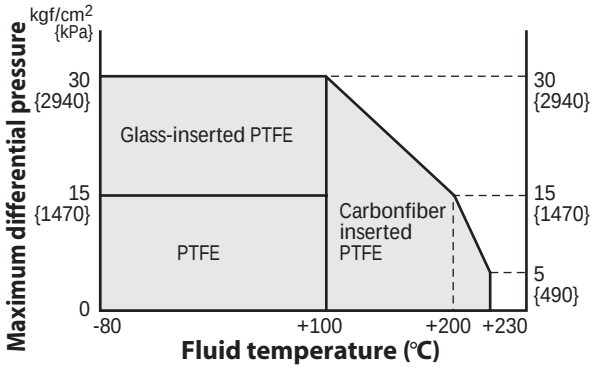


Figure 3 Temperature and maximum differential pressure range for soft-seat

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

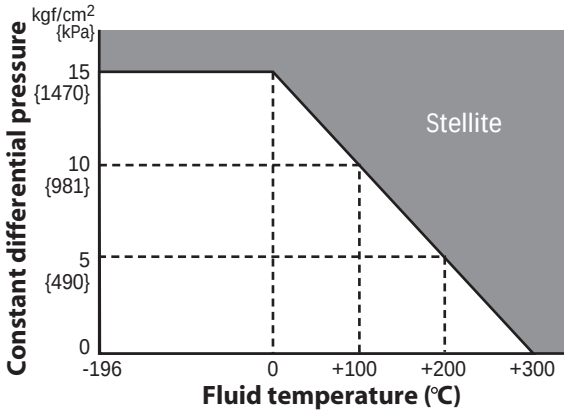


Figure 4 Temperature / normal differential pressure ranges requiring Stellite

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

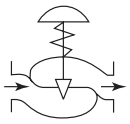
2) SUS440C hardened Stainless steel is recommended for valves for cavitation / flashing service of water or for superheated service of water of higher than 100°C.

3) When rated Cv value is 0.16 or lower, Stellite faced valve plugs or 440C hardened Stainless steel valve plugs are standard.

Allowable differential pressure

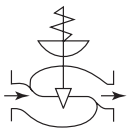
Contoured-type metal seat (%CF, LCF)

Table 3 Air-to-close



Actuator Model No.	Supply Pressure kPa{kgf/cm²}	Spring range kPa {kgf/cm²}	Positioner	Differential pressure {by Cv value} kPa {kgf/cm²}										
				Below 0.1	0.16 to 0.25	0.4	063	1.0	1.6	2.5	4.0	6.3	10	14
HA1D	140 {1.4}	20 to 98 {0.2 to 1.0}	△	—	3920* {40.0}	3040 {31.0}	3040 {31.0}	1570 {16.0}	1570 {16.0}	981 {10.0}	981 {10.0}	550 {5.6}	410 {4.2}	250 {2.6}
				—	5490 {56.0}									
	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}	3920* {40.0}	3920* {40.0}	2740 {28.0}	2060 {21.0}	1270 {13.0}
				—	9810 {100}	9810 {100}	9810 {100}	8240 {84.0}	8240 {84.0}	5100 {52.0}	5100 {52.0}			
	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}	3820 {39.0}
				9810 {100}						9810 {100}	9810 {100}	8240 {84.0}	6180 {63.0}	
HA2D	140 {1.4}	20 to 98 {0.2 to 1.0}	△	—	3920* {40.0}	3920* {40.0}	3920* {40.0}	3200 {32.6}	3200 {32.6}	1960 {20.0}	1960 {20.0}	1070 {10.9}	800 {8.2}	490 {5.0}
				—	9810 {100}	6080 {62.0}	6080 {62.0}							
	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}	3920* {40.0}	3920* {40.0}	3920* {40.0}	2470 {25.2}
				—		9810 {100}	9810 {100}	9810 {100}	9810 {100}	9810 {100}	9810 {100}	5300 {54.0}		
	390 {4.0}	80 to 240 {0.8 to 2.4}	✔	3920* {40.0}	—	—	—	—	—	—	—	3920* {40.0}	3920* {40.0}	3920* {40.0}
				9810 {100}								9810 {100}	9810 {100}	7350 {75.0}

Table 4 Air-to-open



Actuator Model No.	Supply pressure kPa{kgf/cm²}	Spring range kPa{kgf/cm²}	Positioner	Differential pressure {by Cv value} kPa {kgf/cm²}										
				Below 0.1	0.16 to 0.25	0.4	063	1.0	1.6	2.5	4.0	6.3	10	14
HA1R	140 {1.4}	20 to 98 {0.2 to 1.0}	△	—	3920* {40.0}	3040 {31.0}	3040 {31.0}	1570 {16.0}	1570 {16.0}	981 {10.0}	981 {10.0}	550 {5.6}	410 {4.2}	250 {2.6}
				—	5490 {56.0}									
	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}	3820 {39.0}	2840 {29.0}	1760 {18.0}
				9810 {100}		9810 {100}	9810 {100}	9810 {100}	9810 {100}	7060 {72.0}	7060 {72.0}			
HA2R	140 {1.4}	20 to 98 {0.2 to 1.0}	△	—	3920* {40.0}	3920* {40.0}	3920* {40.0}	3200 {32.6}	3200 {32.6}	1960 {20.0}	1960 {20.0}	1070 {10.9}	800 {8.2}	490 {5.0}
				—	9810 {100}	6080 {62.0}	6080 {62.0}							
	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}	3920 {40.0}	3430 {35.0}
				9810 {100}		9810 {100}	9810 {100}	9810 {100}	9810 {100}	9810 {100}	9810 {100}	7450 {75.9}	5490 {56.0}	

Note) 1) ✔ : Positioner is necessary, △: Can be operated either with or without positioner.

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

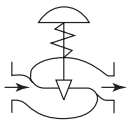
3) The upper figures denote the operating allowable differential pressure; the lower denote allowable differential pressure at full closure.

4) The operating allowable differential pressure with an asterisk(*) should be read as 2940 kPa {30 kgf/cm²}, use the HLC-type cage trim (%CC, LCC). (Refer to the Specification sheet No.SS2-HLC110-0100.)

Allowable differential pressure

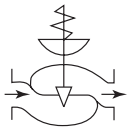
Contoured type soft seat (%TF, LTF)

Table 5 Air-to-close



Actuator Model No.	Supply Pressure kPa{kgf/cm²}	Spring range kPa{kgf/cm²}	Positioner	Differential pressure {by Cv value} kPa {kgf/cm²}									
				Below 0.25	0.4	063	1.0	1.6	2.5	4.0	6.3	10	14
HA1D	140 {1.4}	20 to 98 {0.2 to 1.0}	△	710 {7.2}	710 {7.2}	710 {7.2}	710 {7.2}	710 {7.2}	710 {7.2}	710 {7.2}	390 {4.0}	280 {2.9}	180 {1.8}
	160 {1.6}	20 to 98 {0.2 to 1.0}	✔	2940 {30.0}	2940 {30.0}	2940 {30.0}	2940 {30.0}	2940 {30.0}	2940 {30.0}	2940 {30.0}	1860 {19.0}	1370 {14.0}	890 {9.1}
	390 {4.0}	80 to 240 {0.8 to 2.4}	✔	——	——	——	——	——	——	——	2940 {30.0}	2940 {30.0}	2650 {27.0}
HA2D	140 {1.4}	20 to 98 {0.2 to 1.0}	△	1960 {20.0}	1960 {20.0}	1960 {20.0}	1960 {20.0}	1960 {20.0}	1370 {14.0}	1370 {14.0}	740 {7.6}	560 {5.7}	340 {3.5}
	160 {1.6}	20 to 98 {0.2 to 1.0}	✔	——	2940 {30.0}	2940 {30.0}	2940 {30.0}	2940 {30.0}	2940 {30.0}	2940 {30.0}	2940 {30.0}	2740 {28.0}	1720 {17.6}
	390 {4.0}	80 to 240 {0.8 to 2.4}	✔	——	——	——	——	——	——	——	2940 {30.0}	2940 {30.0}	2940 {30.0}

Table 6 Air-to-open



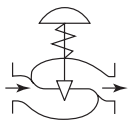
Actuator Model No.	Supply Pressure kPa{kgf/cm²}	Spring range kPa{kgf/cm²}	Positioner	Differential pressure {by Cv value} kPa {kgf/cm²}									
				Below 0.25	0.4	063	1.0	1.6	2.5	4.0	6.3	10	14
HA1R	140 {1.4}	20 to 98 {0.2 to 1.0}	△	710 {7.2}	710 {7.2}	710 {7.2}	710 {7.2}	710 {7.2}	710 {7.2}	710 {7.2}	390 {4.0}	280 {2.9}	180 {1.8}
	270 {2.8}	80 to 240 {0.8 to 2.4}	✔	2940 {30.0}	2940 {30.0}	2940 {30.0}	2940 {30.0}	2940 {30.0}	2940 {30.0}	2940 {30.0}	2650 {27.0}	1960 {20.0}	1180 {12.0}
HA2R	140 {1.4}	20 to 98 {0.2 to 1.0}	△	1960 {20.0}	1960 {20.0}	1960 {20.0}	1960 {20.0}	1960 {20.0}	1370 {14.0}	1370 {14.0}	740 {7.6}	560 {5.7}	340 {3.5}
	270 {2.8}	80 to 240 {0.8 to 2.4}	✔	——	2940 {30.0}	2940 {30.0}	2940 {30.0}	2940 {30.0}	2940 {30.0}	2940 {30.0}	2940 {30.0}	2940 {30.0}	2350 {24.0}

Note) 1) ✔ : Positioner is necessary, △: Can be operated either with or without positioner.

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.

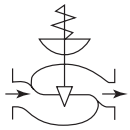
Quick-opening type metal (Stellite) seat (QS)

Table 7 Air-to-close



Action Model No.	Supply pressure kPa {kgf/cm²}	Spring range kPa {kgf/cm²}	Differential pressure kPa {kgf/cm²}	
			Cv=10	Cv=14
HA1D	140 {1.4}	20 {0.2}	720 {7.3}	490 {5.0}
	290 {3.0}	20 {0.2}	1960 {20.0}	1760 {18.0}
HA2D	140 {1.4}	20 to 52 {0.2 to 0.53}	1430 {14.6}	1270 {13.0}
	290 {3.0}	20 to 52 {0.2 to 0.53}	3920 {40.0}	3630 {37.0}

Table 8 Air-to-open



Action Model No.	Supply pressure kPa {kgf/cm²}	Initial spring compression kPa {kgf/cm²}	Differential pressure kPa {kgf/cm²}	
			Cv=10	Cv=14
HA1R	140{1.4}	40{0.4}	330{3.4}	290{3.0}
	270{2.8}	80{0.8}	670{6.8}	590{6.0}
HA2R	140{1.4}	40{0.4}	660{6.7}	590{6.0}
	270{2.8}	80{0.8}	1320{13.5}	1190{12.1}

Note) 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.

DIMENSIONS

Table 9 Face-to-face dimensions [Unit: mm]

Nominal size (inch)			1/2	3/4	1
A	JIS 10K FF, RF ANSI 125 FF JPI 125 FF	ANSI 150 RF JPI 150 RF	184	184	184
	JIS 16K RF		190	190	193
	JIS 20K RF JIS 30K RF	ANSI 300 RF JPI 300 RF	194	194	197
	JIS 40K RF ANSI 600 RF	JPI 600 RF SW, BW	206	206	210
	ANSI 150 RJ	JPI 150 RJ			197
	ANSI 300 RJ	JPI 300 RJ	206	206	210
	ANSI 600 RJ	JPI 600 RJ	206	206	210
	JIS 20K	Tongue and groove male and female	198	198	198
	JIS 30K	Tongue and groove male and female	208	208	212
	ANSI 300 LG	JPI 300	203	203	206
	Screwed end connection type		125	125	125

Note) Face-to-face dimensions conform to IEC 534-3-1976 Standard.

Table 10 Other dimensions [Unit: mm]

Actuator model no.	H					C	B	E
	Plain bonnet	Extension bonnet Type 1	Extension bonnet Type 2		Bellows seal type bonnet			
			Integral cast type	Welded type				
HA1D, R	375	525	685	900	525	218	230	40
HA2D, R	450	600	760	975	600	267	281	40

Note) "H" dimensions are applicable when a handwheel is not provided. When a top-mounted handwheel actuator is used, add the dimensions of handwheel specified on Specification Sheets (No.SS2-8213-0500).

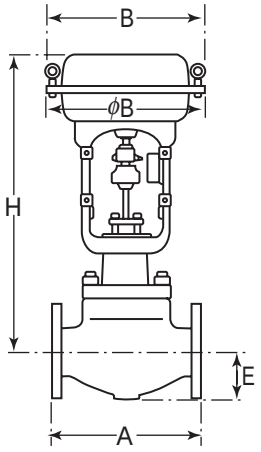


Figure 5 Face-to-face and other dimensions

Weight

Table 11 Screwed end connection type

[Unit: kg]

Nominal size (inches)	Actuator model	Weight				
		Plain bonnet	Extension bonnet Type 1	Extension bonnet Type 2		Bellows-type bonnet
				Integral cast type	Welded type	
1/2 3/4 1	HA1D, R	13	15	18	23	16
	HA2D, R	20	22	25	30	23

Table 12 Flanged end connection type

[Unit: kg]

Nominal size (inch)	Actuator model No.	Weight									
		JIS 10K, ANSI 125, 150, JPI 125, 150					JIS 16K, 20K, 30K, 40K, ANSI 300, 600, JPI 300, 600				
		Plain bonnet	Extension bonnet type	Extension bonnet Type 2		Bellows-type bonnet	Plain bonnet	Extension bonnet Type 1	Extension bonnet Type 2		Bellows-type bonnet
				Integral-cast type	Welded type				Integral-cast type	Welded type	
1/2	HA1D,R	15	17	20	25	18	16	18	21	26	19
	HA2D,R	22	24	27	32	25	23	25	28	33	26
3/4	HA1D,R	16	18	21	26	19	17	19	22	27	20
	HA2D,R	23	25	28	33	26	24	26	29	34	27
1	HA1D,R	16	18	21	26	19	17	19	22	27	20
	HA2D,R	23	25	28	33	26	24	26	29	34	27

Table 13 Welded type

[Unit: kg]

Nominal size (inch)	Actuator model No.	Weight				
		Plain bonnet	Extension bonnet Type 1	Extension bonnet Type 2		Bellows-type bonnet
				Integral cast type	Welded type	
1/2, 3/4, 1 (SW)	HA1D, R	14	16	19	24	19
	HA2D, R	21	23	26	31	26

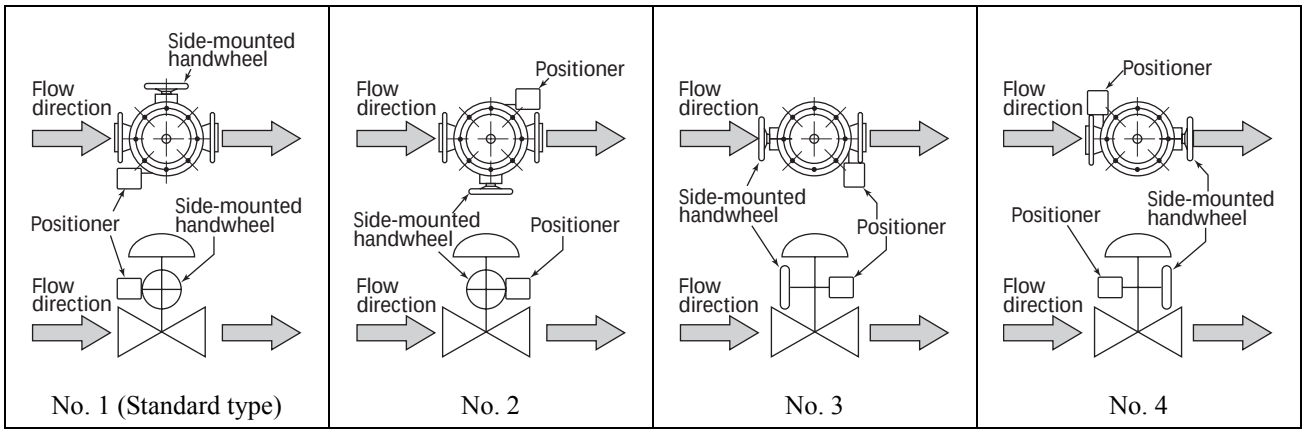


Figure 6 Actuator orientation

Note) 1) Indicated by position number when installation other than by the standard type is required.
2) HA1 actuator is provided with the top-mounted handwheel only.

Ordering information

When ordering, please specify;

1) Model Number: HLS
2) Nominal size × Cv required
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, necessity of handwheel, and air to diaphragm
8) Valve action (direct or reverse)
9) Accessories (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

YAMATAKE

Savemation

Saving through Automation

Yamatake Corporation
Totate international Building
2-12-19 Shibuya
Shibuya-ku, Tokyo 150-8316
Japan
Tel : 81-3-3486-2310
Fax : 81-3-3486-2593

http://www.yamatake.com/