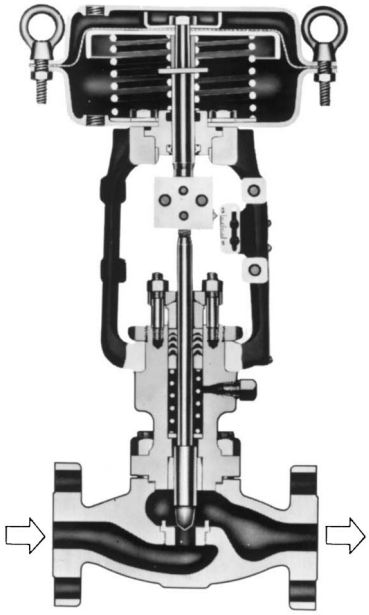
CV3000 Series
Model HLS
Small-Port Single Seated Control Valves

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 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 : ¾, 1in.

(Valves of connection sizes ½, 1½, 2, 2½ and 3 in. are structured by welding flanges of respective sizes to 1in. valves. (See Table 2.)

Pressure rating

· JIS 10K, 16K, 20K, 30, 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 (½ to 2 in.)
BW (2½, 3 in.)

· Threaded end : Rc (½ to1 in.)

Material

For combining the valve body, trim materials and the 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 ºC)
Welded type (-196 to -100 ºC)

· 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

· 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.ID2-8110-0500 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.)
  · Equal percentage (%CF)
  · Linear (LCF)
- Soft seat
  (For flow characteristics, refer to Figure 1 and 2.)
  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) For operating temperature or pressure range of soft seat, refer to Figure 4.

Material

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

Note :

1) For fluid conditions requiring Stellite, refer to Figure 5.

2) For rated CV 0.01 to 0.1 Cage Guide Trim

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 390kPa {1.2 to 4.0 kgf/cm² }
Note) Permissible differential pressure varies depending on spring range and air supply pressure.

Air connection

Rc¼ or ¼NPT internal thread

Ambient temperature

-30 to 70 ºC

Valve action

Direct action (Direct action actuator is combined.)
Reverse action (Reverse action actuator is combined.)

Optional accessories (provided upon request)

Positioner*, pressure regulator with filter, manual operating device*, limit switch, solenoid valve, motion transmitter, volume booster, air lock relay, and others.

Notes : 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	HEP/AVP	THM	—
HA2	HTP	HEP/AVP	THM	SHM

Additional specifications (by special order)

- Special inspection
  Flow characteristics inspection, material inspection (Material certificate), non-destructive inspection, steam inspection, low-temperature inspection
- Seat chamfered flange
- 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

Performance

Rated Cv value

Refer to Table 3.

Flow characteristics

Refer to Figure 1 and 2.

Inherent rangeability

Refer to Table 3.

· Optional : 75:1 for rated Cv 1.0 to 14

Permissible differential pressure

Refer to Table 4 to 9.

Seat leakage rate

· Contoured type plug

IEC534-4-1982 or JISB2007-1993

· 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, HEP : ± 2% F.S.)

Notes : 1) When positioner is not provided, operating performance may vary depending on types of packings used.
2) Parenthesized figures are applicable to Type HA1.

Face-to-face dimensions

Refer to Figure 6 and Table 10.

External dimensions

Refer to Figure 6 and Table 11.

Weight

Refer to Table 12 and 13.

Pipe installation position

Refer to Figure 7.

Finish

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

Table 1. Combining the valve body, trim material and operating 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	0 to 200	-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	—	—	—	—	—	-5 to 300	—	-196 to 300	—	—
JIS	SUS304 Stellite	—	-5 to 425	-5 to 550	-5 to 566	-45 to 350	—	-196 to 550	—	—	—
AISI	304 Stellite										
JIS	SUS304 Stellite face	—	-5 to 425	-5 to 550	-5 to 566	-45 to 350	—	-196 to 550	—	—	—
AISI	304 Stellite face										
JIS	SUS316 Stellite	—	-5 to 425	-5 to 550	-5 to 566	-45 to 350	—	-196 to 550	-196 to 550	—	—
AISI	316 Stellite										
JIS	SUS316 Stellite face	—	-5 to 425	-5 to 550	-5 to 566	-45 to 350	—	-196 to 550	-196 to 550	—	—
AISI	316 Stellite face										
JIS	SUS304L Stellite	—	—	—	—	-45 to 350	—	-196 to 550	—	—	—
AISI	304L Stellite										
JIS	SUS316L Stellite	—	—	—	—	-45 to 350	—	-196 to 450	-196 to 450	-196 to 450	-196 to 450
AISI	316L Stellite										
JIS	SUS329J1 Stellite	—	—	—	—	—	-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	—	—

Table 2.

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	—	—	—

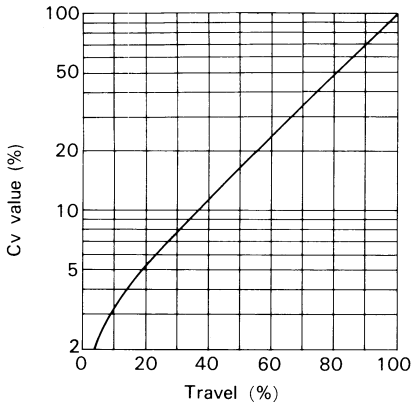
Notes 1) " ▭ " shows standard combination of value body and trim materials.

2) Those complying ASTM Regulation show JIS equivalents.

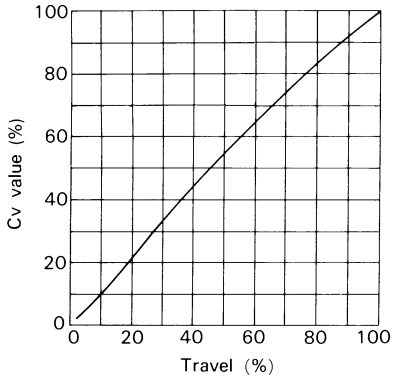
Table 3. Cv value or travel

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						
Connection size (in.)	½ ¾ ¾, 1, 1½, 2, 2½, 3			←	←	←	←	←	←	←	←	←	←	→	→	→	→

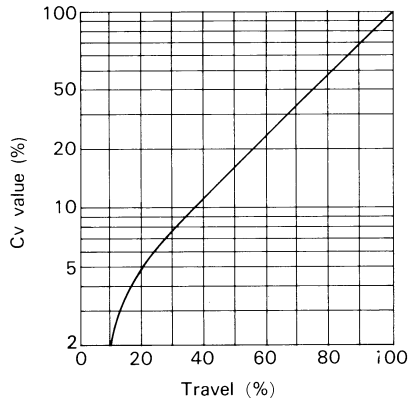
Note) " ✔ " denotes production ranges.



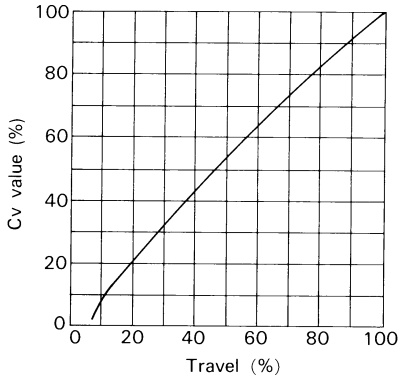
a. Equal percentage characteristics (%CF Metal seat)



b. Linear characteristics (LCF Metal seat)

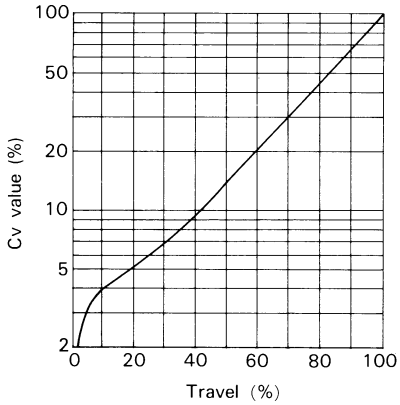


c. Equal percentage characteristics (%TF Soft seat)

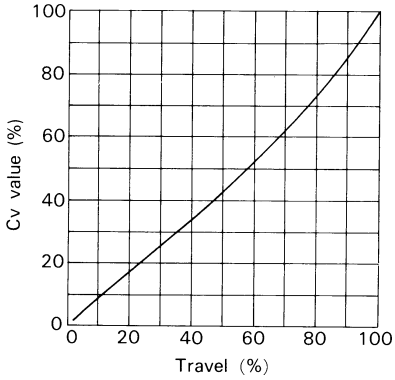


d. Linear characteristics (LTF Soft seat)

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



a. Equal percentage characteristics (%CF Metal seat, %TF Soft seat)



b. Linear characteristics (LCF Metal seat, LTF Soft seat)

Figure 2. Flow characteristics: Contoured type (Cv value: 0.01 to 0.25)

Note) The above graphs indicate typical flow characteristics.

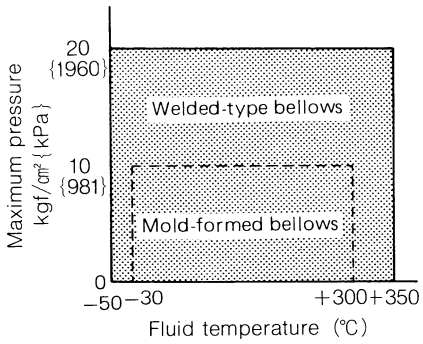


Figure 3. Operating temperature and pressure range bellow type bonnet

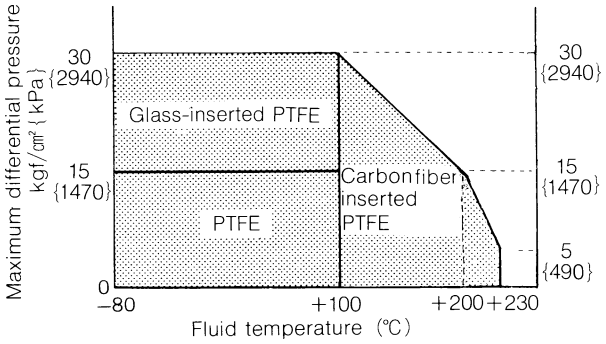


Figure 4. Operating temperature and maximum differential pressure range of soft-seat

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

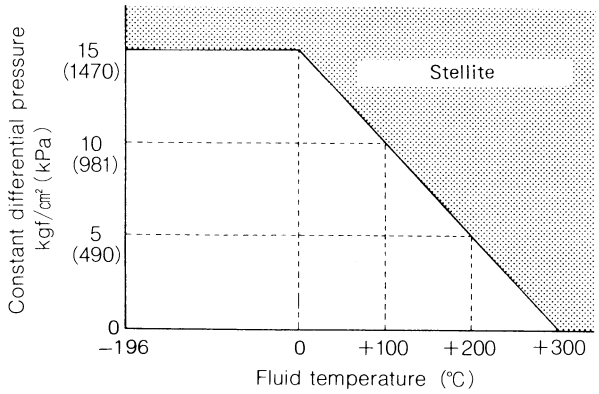


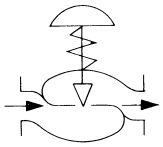
Figure 5. Temperature / constant differential pressure ranges requiring Stellite

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.

Permissible differential pressure

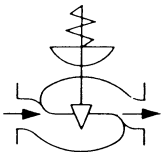
Contoured-type metal seat (%CF, LCF)

Table 4. Direct action (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}	Δ	3920* {40.0} 5490 {56.0}	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}
	160 {1.6}	20 to 98 {0.2 to 1.0}	✔	3920* {40.0} 9810 {100}	3920* {40.0} 9810 {100}	3920* {40.0} 9810 {100}	3920* {40.0} 8240 {84.0}	3920* {40.0} 8240 {84.0}	3920* {40.0} 5100 {52.0}	3920* {40.0} 5100 {52.0}	2740 {28.0}	2060 {21.0}	1270 {13.0}
	390 {4.0}	80 to 240 {0.8 to 2.4}	✔	—	—	—	—	—	3920* {40.0} 9810 {100}	3920* {40.0} 9810 {100}	3920* {40.0} 9810 {100}	3920* {40.0} 9810 {100}	3820 {39.0}
HA2D	140 {1.4}	20 to 98 {0.2 to 1.0}	Δ	3920* {40.0} 9810 {100}	3920* {40.0} 62.0 {6080}	3920* {40.0} 62.0 {6080}	3200 {32.6}	3200 {32.6}	1960 {20.0}	1960 {20.0}	1070 {10.9}	800 {8.2}	490 {5.0}
	160 {1.6}	20 to 98 {0.2 to 1.0}	✔	—	3920* {40.0} 9810 {100}	3920* {40.0} 9810 {100}	3920* {40.0} 9810 {100}	3920* {40.0} 9810 {100}	3920* {40.0} 9810 {100}	3920* {40.0} 9810 {100}	3920* {40.0} 5300 {54.0}	3920 {40.0}	2470 {25.2}
	390 {4.0}	80 to 240 {0.8 to 2.4}	✔	—	—	—	—	—	—	—	3920* {40.0} 9810 {100}	3920* {40.0} 9810 {100}	3920* {40.0} 7350 {75.0}

Table 5. Reverse action (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
HA1D	140 {1.4}	20 to 98 {0.2 to 1.0}	Δ	3920* {40.0} 5490 {56.0}	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}
	160 {1.6}	20 to 98 {0.2 to 1.0}	✔	3920* {40.0} 9810 {100}	3920* {40.0} 9810 {100}	3920* {40.0} 9810 {100}	3920* {40.0} 9810 {100}	3920* {40.0} 9810 {100}	3920* {40.0} 7060 {72.0}	3920* {40.0} 7060 {72.0}	3820 {39.0}	2840 {29.0}	1760 {18.0}
HA2D	140 {1.4}	20 to 98 {0.2 to 1.0}	Δ	3920* {40.0} 9810 {100}	3920* {40.0} 62.0 {6080}	3920* {40.0} 62.0 {6080}	3200 {32.6}	3200 {32.6}	1960 {20.0}	1960 {20.0}	1070 {10.9}	800 {8.2}	490 {5.0}
	160 {1.6}	20 to 98 {0.2 to 1.0}	✔	—	3920* {40.0} 9810 {100}	3920* {40.0} 9810 {100}	3920* {40.0} 9810 {100}	3920* {40.0} 9810 {100}	3920* {40.0} 9810 {100}	3920* {40.0} 9810 {100}	3920* {40.0} 5300 {54.0}	3920 {40.0} 5490 {56.0}	3430 {35.0}

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

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

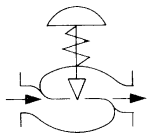
3) The upper figures denote the operating permissible differential pressure; the lower denote permissible differential pressure at full closure.

4) The operating permissible differential pressure with an asterisk(*) should be read as 2940kPa {30kgf/cm2}, use the HLC-type cage trim (%CC, LCC). (Refer to the Specification sheet No.SS1-8113-0210)

Permissible differential pressure

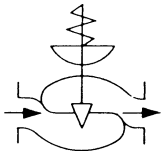
Contoured type soft seat (%TF, LTF)

Table 6. Direct action (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}	Δ	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}	2940 {30.0}
HA2D	140 {1.4}	20 to 98 {0.2 to 1.0}	Δ	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 7. Reverse action (Air-to-open)



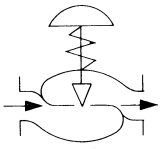
Actuator Model No.	Supply Pressure KPa {Kgf/cm²}	Spring Range KPa {Kgf/cm²}	Positioner	Differential pressure {by Cv value} kPa {kgf/cm²}									
				Below 0.25	0.4	063	1.0	1.6	2.5	4.0	6.3	10	14
HA1D	140 {1.4}	20 to 98 {0.2 to 1.0}	Δ	710 {7.2]	710 {7.2]	710 {7.2]	710 {7.2]	710 {7.2]	710 {7.2]	710 {7.2]	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}	2650 {27.0}	1960 {20.0}	1180 {12.0}
HA2D	140 {1.4}	20 to 98 {0.2 to 1.0}	Δ	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}	2940 {30.0}	2350 {24.0}

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

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

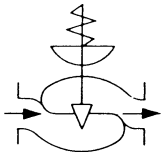
Quick-opening type metal (Stellite) seat (QS)

Table 8. Direct action (Air-to-close)



Action Model No.	Supply pressure kPa {kgf/cm^2}	Spring range kPa {kgf/cm^2}	Differential pressure kPa {kgf/cm^2}	
			Cv=10	Cv=14
HA1D	140 {1.4}	20 {0.2 to }	720 {7.3}	490 {5.0}
	290 {3.0}	20 {0.2 to}	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 9. Reverse action (Air-to-open)



Action Model No.	Supply pressure kPa {kgf/cm^2}	Initial spring compression kPa {kgf/cm^2}	Differential pressure kPa {kgf/cm^2}	
			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 permissible differential pressure to exceed the maximum operating pressure designated by ANSI B16. 34-1981 or JIS B2201-1984.

DIMENSIONS

Table 10. Face-to-face dimensions (Unit : mm)

Nominal size (in.)	A										
	JIS 10K FF,RF ANSI 125FF JPI 125FF ANSI 150RF JPI 150RF	JIS16KRF	JIS20KRF JIS30KRF ANSI300RF JPI300RF	JIS40KRF ANSI600RF JPI600RF SW,BW	ANSI150RJ JPI150RJ	ANSI300RJ JPI300RJ	ANSI 600RJ JPI600RJ	JIS20K Tongue and groove Male and female	JIS30K Tongue and groove Male and female	ANSI1300LG JP1300LG	Screw-on Type
½	184	190	194	206	—	206	206	198	208	203	125
¾	184	190	194	206	—	206	206	198	208	203	125
1	184	193	197	210	197	210	210	198	212	206	125
1½	222	231	235	251	235	248	251	236	248	244	—
2	254	263	267	286	267	283	289	267	276	276	—
2½	276	288	292	311	289	308	314	292	303	302	—
3	298	313	317	337	311	333	340	317	326	327	—

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

Table 11. External dimensions (Unit: mm)

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

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

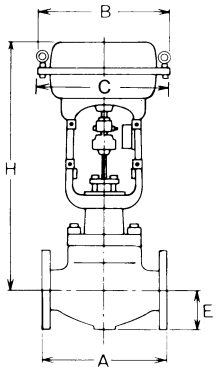


Figure 6. Face-to-face and External dimensions

Weight

Table 12. Screw-on type (Unit: kg)

Nominal size (in.)	Actuator model	Weight				
		Plain bonnet	Extension bonnet Type 1	Extension bonnet Type 2		Bellow-type bonnet
				Integral cast type	Welded type	
½ ¾ 1	HA1D,R	13	15	18	23	16
	HA2D,R	20	22	25	30	23

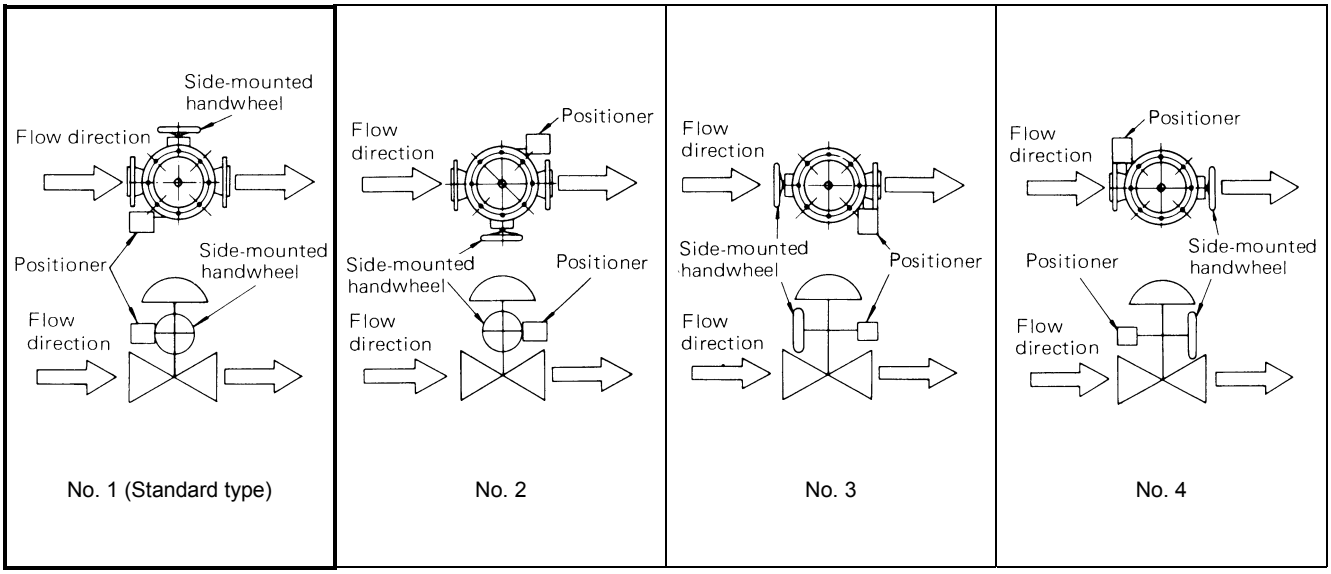
Table 13. Flanged type (Unit: kg)

Nominal size (in.)	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		Bellow-type bonnet	Plain bonnet	Extension bonnet Type 1	Extension bonnet Type 2		Bellow-type bonnet
				Integral-cast type	Welded type				Integral-cast type	Welded type	
½	HA1D,R	15	17	20	25	18	16	18	21	26	19
	HA2D,R	22	24	27	32	25	23	25	28	33	26
¾	HA1D,R	16	18	21	26	119	17	19	22	27	20
	HA2D,R	23	25	28	33	26	24	26	29	34	27
1	HA1D,R	16	18	21	26	1+	17	19	22	27	20
	HA2D,R	23	25	28	33	26	24	26	29	34	27
1½	HA1D,R	17	19	22	27	20	18	20	23	28	22
	HA2D,R	24	26	29	34	27	25	27	30	35	29
2	HA1D,R	19	21	24	29	22	20	22	25	30	23
	HA2D,R	26	28	31	36	29	27	29	32	37	30
2½	HA1D,R	22	24	27	32	25	23	25	28	33	26
	HA2D,R	29	31	34	39	32	30	32	35	40	33
3	HA1D,R	27	29	32	37	30	28	30	33	38	31
	HA2D,R	34	36	39	44	37	35	37	40	45	38

Table 14. Welded type

(Unit: mm)

Nominal size (in.)	Actuator model No.	Weight				
		Plain bonnet	Extension bonnet Type 1	Extension bonnet Type 2		Bellow-type bonnet
				Integral cast type	Welded type	
½, ¾, 1 (SW)	HA1D,R	14	16	19	24	19
	HA2D,R	21	23	26	31	26
1½, 2 (SW)	HA1D,R	15	17	20	25	20
	HA2D,R	22	24	27	32	27
2½ (BW)	HA1D,R	16	18	21	26	20
	HA2D,R	23	25	28	33	27
3 (BW)	HA1D,R	19	21	24	29	22
	HA2D,R	26	28	31	36	29



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.

Figure 7. Pipe installation positions

Ordering Information

When ordering, please specify;

1) Model Number: HLS
2) Nominal size X 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, air to diaphragm
8) Valve action (direct or reverse)
9) Accessories (positioner, handwheek, pressure regulator etc.)
10) Special requirement of degreasing, free from copper 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

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Saving through Automation

Yamatake Corporation

Totate International Building
2-12-19 Shibuya
Shibuya-ku, Tokyo 150-8316
Japan

Tel : 81-3-3486-2216
Fax : 81-3-3486-2503

Certificate No. Q17862

Certificate No. E8318
For Shonan Factory

http://www.yamatake.co.jp/