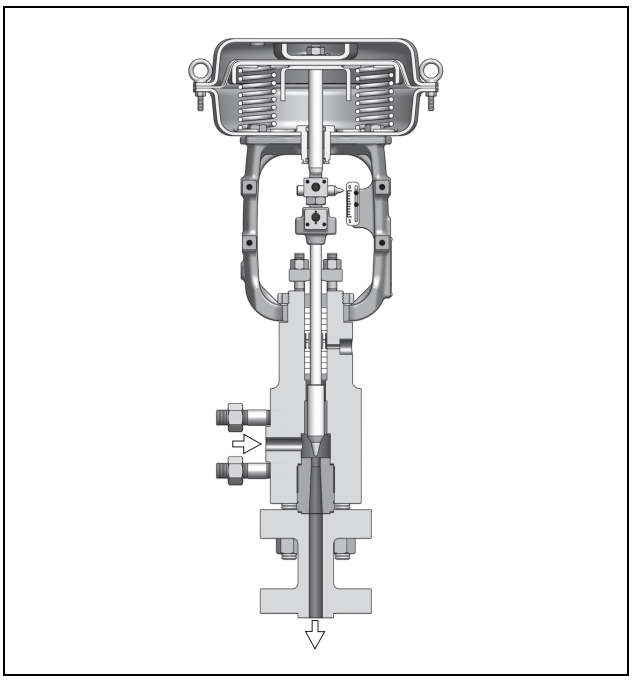
Angle type Control Valves for High Pressure Service

Model HAH

OVERVIEWS

The high pressure service angle type control valves (model HAH) are rated at ANSI 2500 and hard alloy is employed to valve plug and seat ring to prevent abrasion due to high pressure fluid. Flow direction is from horizontal to bottom side as a standard. (For gas service, from bottom to horizontal side also acceptable)



SPECIFICATIONS

Body

Type
Venturi-throat type, forged angle valve

Nominal size
3/4, 1, 1½ inches

Pressure rating
ANSI 2500

End connection
Flanged end and stud bolt :

Connection type	Pressure rating	Applicable standard
RF	ANSI Class 2500	ANSI B16.5-1968
RJ		

Material
Carbon steel (SF 440A), SUSF304, SUSF316 and Other alloy steel.

Bonnet
Plain bonnet (0 to 200°C)
Finned bonnet (200 to 425°C)

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.

Trim

Valve plug
Single seated, contoured plug
Metal seat: Equal percentage (%C), Linear (LC)
(For flow characteristics, refer to Fig.1)

Material
SUS316 Stellite, SUS440C and other alloy steel.

Actuator

Type
Single acting diaphragm actuator (Type HA)

Action
Direct or reverse action

Diaphragm
Cloth embedded ethylene propylene rubber

Spring range
40 to 200 kPa {0.4 to 2.0 kgf/cm²}
80 to 240 kPa {0.8 to 2.4 kgf/cm²}

Supply pressure
280 to 400 kPa {2.8 to 4.0 kgf/cm²}

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

Ambient temperature
-30 to 70 °C

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

Optional accessories

Positioner, pressure regulator with filter, hand wheel, limit switch, solenoid valve, motion transmitter, booster relay, lock-up valve, and others.

Note) For the optional items, refer to the specification sheets and installation drawing of respective accessories.

Additional specifications (by special order)

- Special inspection
  Flow characteristics inspection, material inspection (Material certificate), non-destructive inspection, steam inspection.
- Double gland
- Steam jacket
- Oil/water free treatment
- Copper free treatment
- Stainless steel(SUS 304) atmosphere exposed nuts and bols
- Special air piping and joint
- Sand-/dust-preventive measures
- Saline damage countermeasures
- Tropical-area use specifications
- Cold-area use specifications

Performance

Rated Cv value

Refer to Table 1.

Flow characteristic

Refer to Figure 1.

Inherent rangeability

30:1

Allowable differential pressure

Refer to Table 2 to 5.

Leakage specification

IEC 60534-4:2006 or JIS B2005-4:2008

Standard….. Class IV: Leakage less than 0.01% of maximum valve capacity

Option…… 0.001% of maximum valve capacity

Hysteresis error

With positioner: Within 1%F.S.

Linearity

With positioner: Within ±1%F.S.

Dimensions

Refer to Figure 2 and Table 10.

Weight

Refer to Table 11.

Actuator orientation

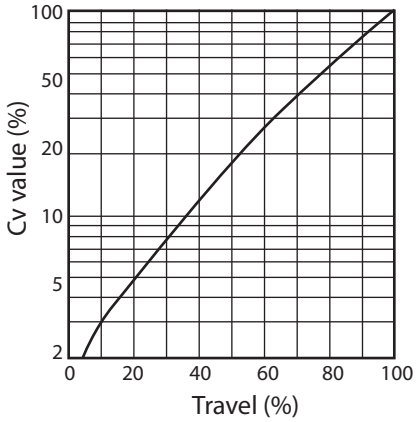
Refer to Figure 3.

Finish

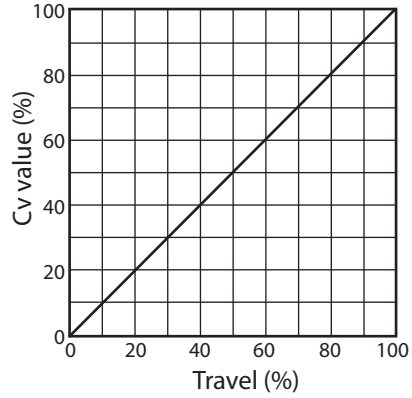
Blue (Munsell 10B5/10) or silver, or other specified colors.

Table 1 Cv value and rated travel

Nominal size (inches)	3/4					1	1½
Port size (mm)	6			8	10	15	16
Rated Cv value	0.33	0.73	1.3	2.3	3.2	6	9
Rated travel (mm)	14.3					19.05	23.8



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



b. Linear characteristics (LC: Metal seat)

Figure 1 Flow characteristics

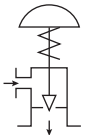
Note) The above graphs indicate typical flow characteristics.

Allowable differential pressure

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

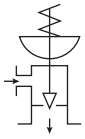
Flow direction from side to bottom

Table 2 Air-to-close



Actuator model No.	Supply pressure kPa {kgf/cm²}	Spring range kPa {kgf/cm²}	Differential pressure (by Cv value) MPa {kgf/cm²}									
			0.33 to 1.3		2.3		3.2		6		9	
			A	B	A	B	A	B	A	B	A	B
HA3D	280 {2.8}	40 to 200 {0.4 to 2.0}	36.1 {368}	15.9 {162}	41.2 {420}	17.5 {178}	27.4 {279}	20.2 {206}	16.2 {165}	14.0 {143}		
	400 {4.0}	80 to 240 {0.8 to 2.4}	41.2 {420}	34.1 {348}	41.2 {420}	37.6 {383}	27.4 {279}	27.4 {279}	16.2 {165}	16.2 {165}		
HA4D	280 {2.8}	40 to 200 {0.4 to 2.0}									18.5 {189}	15.2 {155}
	400 {4.0}	80 to 240 {0.8 to 2.4}									18.5 {189}	18.5 {189}

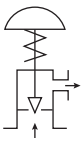
Table 3 Air-to-open



Actuator model No.	Supply pressure kPa {kgf/cm²}	Spring range kPa {kgf/cm²}	Differential pressure (by Cv value) MPa {kgf/cm²}									
			0.33 to 1.3		2.3		3.2		6		9	
			A	B	A	B	A	B	A	B	A	B
HA3R	400 {4.0}	80 to 240 {0.8 to 2.4}	36.1 {368}	15.9 {162}	41.2 {420}	17.5 {178}	27.4 {279}	20.2 {206}	16.2 {165}	14.0 {143}		
HA4R	400 {4.0}	80 to 240 {0.8 to 2.4}									18.5 {189}	15.2 {155}

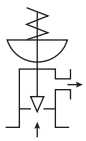
Flow direction from bottom to side

Table 4 Air-to-close



Actuator model No.	Supply pressure kPa {kgf/cm²}	Spring range kPa {kgf/cm²}	Differential pressure (by Cv value) MPa {kgf/cm²}									
			0.33 to 1.3		2.3		3.2		6		9	
			A	B	A	B	A	B	A	B	A	B
HA3D	280 {2.8}	40 to 200 {0.4 to 2.0}	41.2 {420}	23.4 {239}	41.2 {420}	20.6 {210}	41.2 {420}	17.8 {182}	28.4 {290}	11.3 {115}		
	400 {4.0}	80 to 240 {0.8 to 2.4}	41.2 {420}	41.2 {420}	41.2 {420}	41.2 {420}	41.2 {420}	39.0 {398}	41.2 {420}	24.2 {247}		
HA4D	280 {2.8}	40 to 200 {0.4 to 2.0}									32.4 {330}	12.6 {128}
	400 {4.0}	80 to 240 {0.8 to 2.4}									41.2 {420}	27.1 {276}

Table 5 Air-to-open



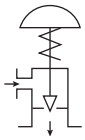
Actuator model No.	Supply pressure kPa {kgf/cm²}	Spring range kPa {kgf/cm²}	Differential pressure (by Cv value) MPa {kgf/cm²}									
			0.33 to 1.3		2.3		3.2		6		9	
			A	B	A	B	A	B	A	B	A	B
HA3R	400 {4.0}	80 to 240 {0.8 to 2.4}	41.2 {420}	23.4 {239}	41.2 {420}	20.6 {210}	41.2 {420}	17.8 {182}	28.4 {290}	11.3 {115}		
HA4R	400 {4.0}	80 to 240 {0.8 to 2.4}									32.4 {330}	12.6 {128}

Note) *A : $\triangle P \fallingdotseq P_1$, $\triangle P_2 \fallingdotseq 0$, B: $\triangle P \fallingdotseq \frac{1}{2} P_1$*

Contoured-type metal seat (%C, LC) : Graphite packing "P6610CH + P6528" (+200 to 425°C)

Flow direction from side to bottom

Table 6 Air-to-close



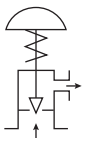
Actuator model No.	Supply pressure kPa {kgf/cm²}	Spring range kPa {kgf/cm²}	Differential pressure (by Cv value) MPa {kgf/cm²}									
			0.33 to 1.3		2.3		3.2		6		9	
			A	B	A	B	A	B	A	B	A	B
HA3D	280 {2.8}	40 to 200 {0.4 to 2.0}	26.9 {274}	15.9 {162}	32.2 {328}	17.5 {178}	27.4 {279}	20.2 {206}	16.2 {165}	14.0 {143}		
	400 {4.0}	80 to 240 {0.8 to 2.4}	41.2 {420}	34.1 {348}	41.2 {420}	37.6 {383}	27.4 {279}	27.4 {279}	16.2 {165}	16.2 {165}		
HA4D	280 {2.8}	40 to 200 {0.4 to 2.0}									18.5 {189}	15.2 {155}
	400 {4.0}	80 to 240 {0.8 to 2.4}									18.5 {189}	18.5 {189}

Table 7 Air-to-open

Actuator model No.	Supply pressure kPa {kgf/cm²}	Spring range kPa {kgf/cm²}	Differential pressure (by Cv value) MPa {kgf/cm²}									
			0.33 to 1.3		2.3		3.2		6		9	
			A	B	A	B	A	B	A	B	A	B
HA3R	280 {2.8}	80 to 240 {0.8 to 2.4}	26.9 {274}	15.9 {162}	32.2 {328}	17.5 {178}	27.4 {279}	20.2 {206}	16.2 {165}	14.0 {143}		
HA4R	280 {2.8}	80 to 240 {0.8 to 2.4}									18.5 {189}	15.2 {155}

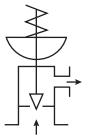
Flow direction from bottom to side

Table 8 Air-to-close



Actuator model No.	Supply pressure kPa {kgf/cm²}	Spring range kPa {kgf/cm²}	Differential pressure (by Cv value) MPa {kgf/cm²}									
			0.33 to 1.3		2.3		3.2		6		9	
			A	B	A	B	A	B	A	B	A	B
HA3D	280 {2.8}	40 to 200 {0.4 to 2.0}	41.2 {420}	23.4 {239}	41.2 {420}	20.6 {210}	32.4 {330}	17.8 {182}	20.0 {204}	11.3 {115}		
	400 {4.0}	80 to 240 {0.8 to 2.4}	41.2 {420}	41.2 {420}	41.2 {420}	41.2 {420}	41.2 {420}	39.0 {398}	41.2 {420}	24.2 {247}		
HA4D	280 {2.8}	40 to 200 {0.4 to 2.0}									26.2 {267}	12.6 {128}
	400 {4.0}	80 to 240 {0.8 to 2.4}									41.2 {420}	27.1 {276}

Table 9 Air-to-open



Actuator model No.	Supply pressure kPa {kgf/cm²}	Spring range kPa {kgf/cm²}	Differential pressure (by Cv value) MPa {kgf/cm²}									
			0.33 to 1.3		2.3		3.2		6		9	
			A	B	A	B	A	B	A	B	A	B
HA3R	280 {2.8}	80 to 240 {0.8 to 2.4}	41.2 {420}	23.4 {239}	41.2 {420}	20.6 {210}	32.4 {330}	17.8 {182}	20.0 {204}	11.3 {115}		
HA4R	280 {2.8}	80 to 240 {0.8 to 2.4}									26.2 {267}	12.6 {128}

Note) *A : $\triangle P \fallingdotseq P_1$, $\triangle P_2 \fallingdotseq 0$, B: $\triangle P \fallingdotseq \frac{1}{2} P_1$*

DIMENSIONS

Table 10 Dimensions (Unit : mm)

Nominal size (inches)	Actuator model no.	A	E	D	H		B
					Plain bonnet	Extention bonnet	
3/4	HA2D, R	61.4	220	55	495	625	281
	HA3D, R	61.4	220	55	565	695	363
1	HA3D, R	71.4	250	65	585	710	363
1½	HA4D, R	81.4	285	75	820	975	520

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

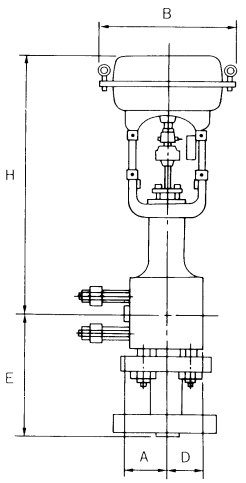


Figure 2 Face-to-face and external dimensions

Table 11 Weight (Unit : kg)

Nominal size (inches)	Actutaor model no.	Plain bonnet	Finned bonnet
3/4	HA2D, R	63	73
	HA3D, R	76	91
1	HA3D, R	101	111
1½	HA4D, R	188	208

Note) Weights shown above are applicable when a hand wheel is not provided. When a hand wheel is used, add the weights of hand wheel specified on Specification Sheet. (No.SS2-8213-0500)

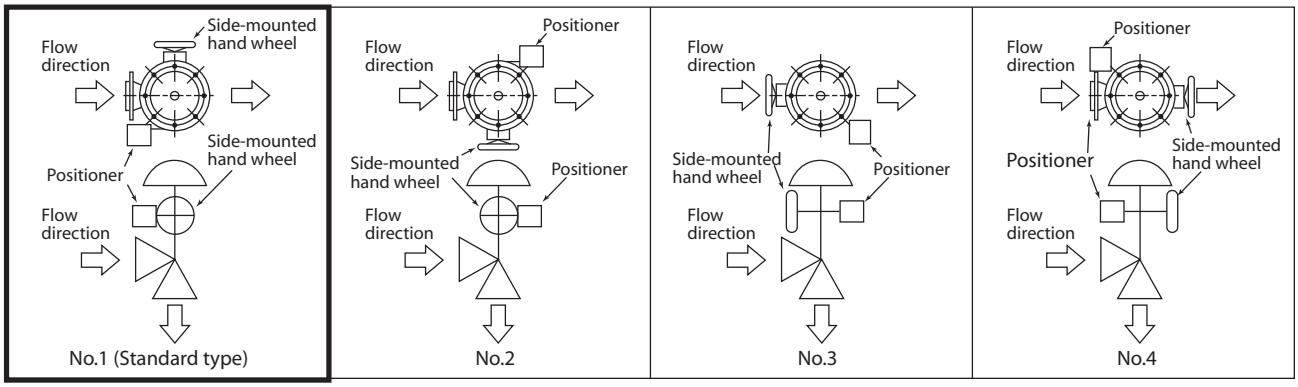


Figure 3 Actuator orientation

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

Ordering information

When ordering, please specify:

1) Model number: HAH
2) Valve size or Cv required.
3) Body rating of type of end connection.
4) Body and trim material, necessity of hardening.
5) Valve characteristics and type of plug
6) Type of actuator, necessity of manual handle, supply air pressure.
7) Necessity of positioner, pressure regulator with filter.
8) Valve action (direct or reverse)
9) Necessity of special spec. such as oil-free, free from copper, etc.
10) Name of flow medium.
11) Normal flow and maximum required.
12) Pressure of flow medium, upstream and downstream pressure (at fully closed and fully opend).
13) Temperature and specific grabity of flow medium.
14) Viscosty of flow medium, inclusive or exclusive of slurry.
15) Directions of medium flow.

Note

Note

Please, read 'Terms and Conditions' from following URL before the order and use.

http://www.azbil.com/products/bi/order.html

Specifications are subject to change without notice.

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