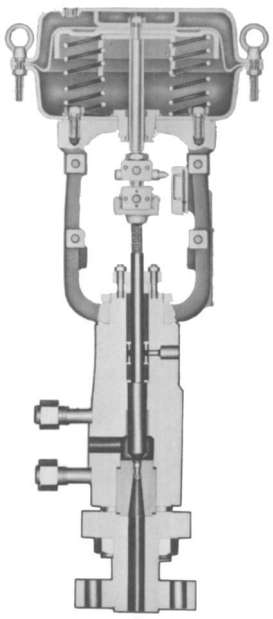
Model HAH

Angle type Control Valves for High Pressure Service

OVERVIEW

The High pressure service angle type control valves(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

Single seated, Venturi-throat type, Angle valve

Size

3/4, 1, 1½ in.

Rating

ANSI 2500

End connection

Flanged end and stud bolt (RF, RJ and lens ring)

Material

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

Bonnet

Plan bonnet (0 to 200°C)

Extension bonnet (200 to 425°C)

Gland type

Bolted gland

Packing

Grease provided

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

Trim

Valve plug

Single seated, contoured plug

Equal percentage (%C)

Linear (LC)

Material

SUS316 stellite coating (entire surface), SUS440C and other alloy steel.

Actuator

Type

Multi-spring type diaphragm motor (Model HA)

Action

Direct or reverse

Diaphragm material

Ethylene propylene rubber reinforced with fabric

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 kPa {2.8 kgf/cm²}

Note) Permissible pressure differential depends on spring range and supply pressure.

Air connection

Rc¼ or ¼NPT

Ambient temperature

-30 to 70 °C

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, handwheel, limit switch, solenoid valve, motion transmitter, volume booster, air lock relay, and other available.

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

Additional specifications (by special order)

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

Performance

Rated Cv valve

Refer to Table 1.

Flow characteristics

Refer to Figure 1.

Inherent rangeability

30:1

Permissible differential pressure

Refer to Table 3, 4 and 5.

Seat leakage rate (percentage to rated Cv value)

IEC 534-4-1986 or JIS B2007-1993

Class IV : Leakage less than 0.01%

Hysteresis error

1% F.S. or less (with positioner)

Linearity : ± 1% F.S. or less (with positioner)

Face-to-face dimensions

Refer to Table 6, Figure 2.

Dimensions

Refer to Table 6, Figure 2.

Weight

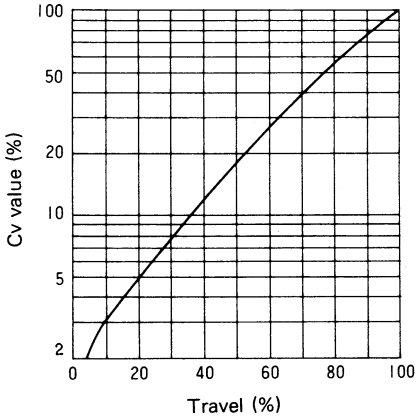
Refer to Table 7.

Finish

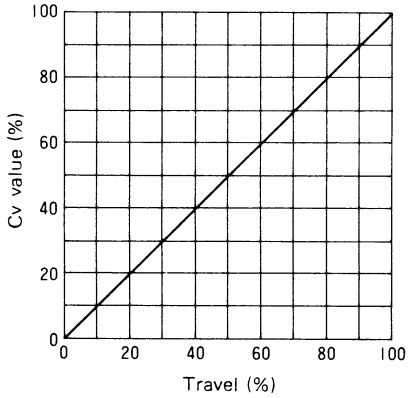
Blue (Munsell 10B5/10) or Silver, or custmer specified colors.

Table 1. Flow coefficient Cv and stem travel

Valve size (inch)	3/4					1	1½
Port size (mm)	6			8	10	13	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)

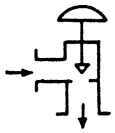
Figure 1. Flow characteristics

(Idealistic flow characteristics is indicated in this graph.)

Permissible differential pressure

Flow direction from horizontal to bottom side

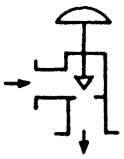
Table 2. Direct action (air-to-close)



Actuator Model No.	Supply pressure kPa {kgf/cm²}	Spring range kPa {kgf/cm²}	Differential pressure kPa {kgf/cm²}									
			Cv value									
			0.33 to 1.3		2.3		3.2		6		9	
			A	B	A	B	A	B	A	B	A	B
HA3D	200 {2.8}	40 to 200 0.4 to 2.0	36100 {368}	15900 {162}	41200 {420}	17500 {178}	27400 {280}	20200 {206}	16200 {165}	14000 {142}		
	400 {4.0}	80 to 240 {0.8 to 2.4}	41200 {420}	34100 {347}	41200 {420}	37600 {383}	27400 {280}	27400 {280}	16200 {165}	16200 {165}		
HA4D	280 {2.8}	40 to 200 {0.4 to 2.0}									18500 {189}	15200 {155}
	400 {4.0}	80 to 240 {0.8 to 2.4}									18500 {189}	18500 {189}

Note: 1) A : $\Delta P \approx P_1$, $\Delta P_2 \approx P0$ B : $\Delta P \approx 1/2P_1$

Table 3. Reverse action (air-to-open)

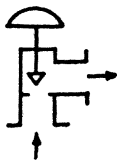


Actuator Model No.	Supply pressure kPa {kgf/cm²}	Spring range kPa {kgf/cm²}	Differential pressure kPa {kgf/cm²}									
			Cv value									
			0.33 to 1.3		2.3		3.2		6		9	
			A	B	A	B	A	B	A	B	A	B
HA3R	400 {4.0}	80 to 240 {0.8 to 2.4}	36100 {368}	15900 {162}	41200 {420}	17500 {178}	27400 {280}	20200 {206}	16200 {165}	14000 {142}		
HA4R	400 {4.0}	80 to 240 {0.8 to 2.4}									18500 {189}	15200 {155}

Note: 1) A : $\Delta P \approx P_1$, $\Delta P_2 \approx P0$ B : $\Delta P \approx 1/2P_1$

Flow direction from bottom to horizontal side

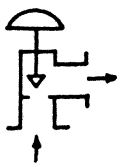
Table 4. Direct action (air-to-close)



Actuator Model No.	Supply pressure kPa {kgf/cm²}	Spring range kPa {kgf/cm²}	Differential pressure kPa {kgf/cm²}									
			Cv value									
			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}	41200 {420}	23400 {239}	41200 {420}	20600 {210}	41200 {420}	17800 {182}	28400 {290}	11300 {115}		
	400 {4.0}	80 to 240 {0.8 to 2.4}	41200 {420}	41200 {420}	41200 {420}	41200 {420}	41200 {420}	39000 {383}	41200 {420}	24200 {247}		
HA4D	280 {2.8}	40 to 200 {0.4 to 2.0}									32400 {330}	12600 {129}
	390 {4.0}	80 to 240 {0.8 to 2.4}									41200 {420}	27100 {276}

Note: 1) A : $\Delta P \approx P_1$, $\Delta P_2 \approx P0$ B : $\Delta P \approx 1/2P_1$

Table 5. Reverse action (air-to-open)



Actuator Model No.	Supply pressure kPa {kgf/cm²}	Spring range kPa {kgf/cm²}	Differential pressure kPa {kgf/cm²}									
			Cv value									
			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}	41200 {420}	23400 {239}	41200 {420}	20600 {210}	41200 {420}	17800 {182}	28400 {290}	11300 {115}		
HA4R	400 {4.0}	80 to 240 {0.8 to 2.4}									32400 {330}	12600 {129}

Note: 1) A : $\Delta P \approx P_1$, $\Delta P_2 \approx P0$ B : $\Delta P \approx 1/2P_1$

Table 6. Dimensions

Valve Size (in.)	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 a handwheel is not provided. When a handwheel actuator is used, add the dimensions of handwheel specified on Specification. (No. SS2-8213-0500)

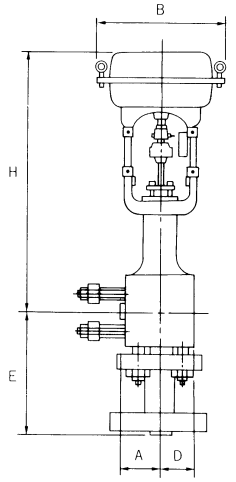
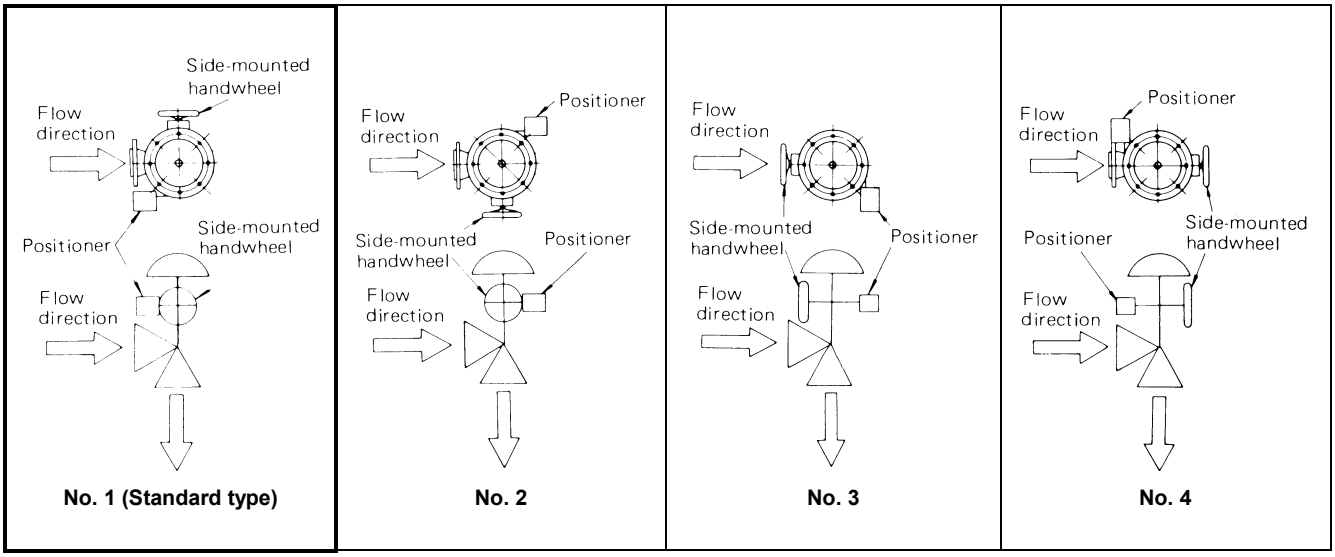


Figure 2. Dimensions

Table 7. Weight (Unit:kg)

Valve size (in.)	Actuator model no.	Plain bonnet	Extension 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 handwheel is not provided. When a handwheel actuator is used, add the weights of handwheel specified on Specification Sheet. (No.SS2-8213-0500)



Note) When you require installation of the valve in a position other than the standard installation position, indicate the required installation position by the installation position number.

Figure 3. Pipe installation position

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) Valve action (direct or reverse)
8) Necessity of positioner, pressure regulator with filter.
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 opened).
13) Temperature and specific grabity of flow meium
14) Viscosty of flow medium, inclusive or exclusive of slurry.
15) Direction sof medium flow.

Note

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