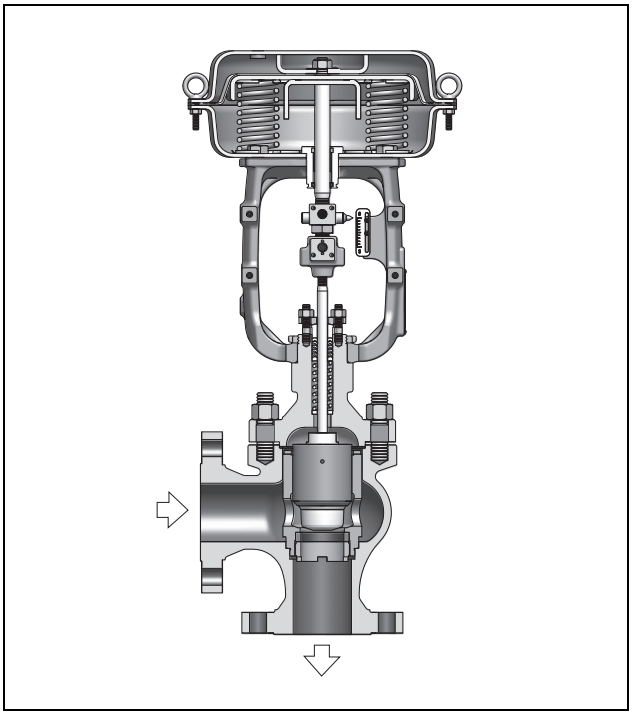
Ceramic Trim Angle Control Valves

Model HAF

OVERVIEW

Model HAF ceramic trim angle control valves provide the valve plug and sheet ring employing high performance ceramic with excellent errosion-proof capability, which most likely apts to accept damage. The HAF are best-suited for FCC of petroleum refinery, control of slurries such as paper and pulp control process. The actuator employs compact, high output multi-spring type diaphragm motor.



SPECIFICATIONS

Body

Type

Cast angle valve

Nominal size

1, 1½, 2, 2½, 3, 4 inches

Pressure rating

- JIS 10K, 16K, 20K, 30K, 40K
- ANSI Class 150, 300, 600
- JPI Class 150, 300, 600

End connection

Flanged end:

Connection type	Pressure rating	Applicable standard
FF	JIS10K	JIS B2212-1972
	ANSI Class 125	ANSI B16.5-1968
	JPI Class 125	JPI-7S-15-1993
RF	JIS10K	JIS B2212-1972
	JIS16K	JIS B2213-1967
	JIS20K	JIS B2214-1967
	JIS30K	JIS B2215-1967
	JIS40K	JIS B2216-1967
	ANSI Class 150, 300, 600	ANSI B16.5-1968
	JPI Class 150, 300, 600	JPI-7S-15-1993
RJ	ANSI Class 150, 300, 600	ANSI B16.5-1968
	JPI Class 150, 300, 600	JPI-7S-15-1993

Material

For body/trim material combinations and operating temperature ranges, refer to Table 1.

Bonnet

- Plain bonnet (0 to 200 °C)
- Extension bonnet (-50 to 0°C and 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.

Note) PTFE: Polytetrafluoroethylene

Gasket

Type

Serrated type

Material

Stainless steel SUS316

Trim

Valve plug

Single seated, Contoured-type plug

- Metal seat for seat ring and ceramic seat for plug seat
  Equal percentage (%C), Linear (LC)
  (For flow characteristics, refer to Fig.1)

Material

For body/trim material combinations and operating temperature ranges, refer to Table 1.

Heat-resisting shock value

200°C

Note) Do not apply thermal shock exceeding this temperature.

Actuator

Type

Single acting diaphragm actuator (Type PSA1, HA)

Action

Direct or reverse action

Diaphragm

Cloth embedded ethylene propylene rubber

Spring range

20 to 98 kPa {0.2 to 1.0 kgf/cm^2}
80 to 240 kPa {0.8 to 2.4 kgf/cm^2}

Supply pressure

140 to 290 kPa {1.4 to 3.0 kgf/cm^2}

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

2) Accessories with the asterisk mark (*) are selected from the following types depending on the actuators to be combined.

Actuator	Positioner		Hand wheel	
	P/P	I/P	Top	Side
PSA1	VPE/HTP	AVP/HEP	THM	SHM
HA2 to 4	HTP	AVP/HEP	THM	SHM

Additional specifications (by special order)

- Special inspection
  Flow characteristic inspection, material inspection (material certificate), non-destructive inspection, steam inspection
- Double gland
- Steam jacket
- Oil/Water free treatment
- Yoke material SCPH2
  (Yoke material of PSA1 is SCPH2 as standard)
- Copper free treatment
- Stainless steel (SUS304) atmosphere exposed nuts and bolts
- Special air piping and joint
- Sand-/dust-preventive measures
- Saline damage countermeasures
- Tropical-area use specifications
- Cold-area use specifications
- Vacuum service

Performance

Rated Cv value
Refer to Table 2.

Flow characteristic

Refer to Figure 1.

Inherent rangeability

30:1

Allowable differential pressure

Refer to Table 3 and Table 4.

Leakage specification

IEC 60534-4:2006 or JIS B2005-4:2008
Standard…..Class IV: Leakage less than 0.01% of maximum valve capacity

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.
(±3%F.S. with model VPE positioner, ±2%F.S. with model AVP/HEP positioner)

Note) 1) When positioner is not provided, operating performance may vary depending on type of packing used. Refer to document No. ID2-8113-0040.

2) Parenthesized figures are applicable to Type PSA1.

Dimensions

Refer to Figure 2 and Table 5 and 6.

Actuator orientation

Refer to Figure 3.

Finish

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

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

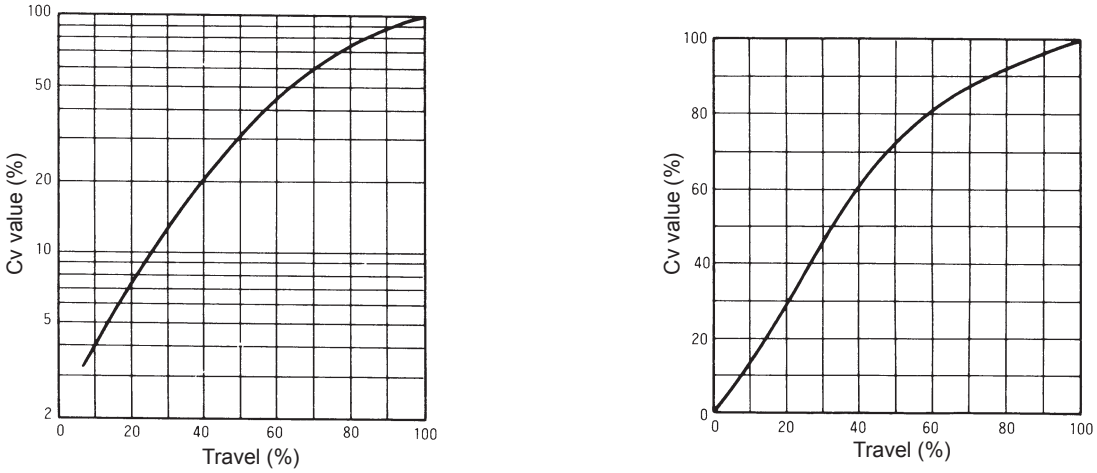
Trim material \ Body material			SCPH2	SCPH21	SCS13	SCS14
Valve plug	Seat ring					
	Seat	Port				
Cyaron ceramic	SUS440C	Cyaron ceramic	0 to +425		—	—
Silicon carbide ceramic		Silicon carbide ceramic	0 to +425		—	—
Cyaron ceramic	SUS316 Stellite armoting	Cyaron ceramic	—	—	0 to +425	
Silicon carbide ceramic		Silicon carbide ceramic	—	—	0 to +425	

Note) "▭" *shows standard combination of body and trim materials.*

Cv value and travel

Table 2 Cv value and travel

Nominal size (inches)	1			1½			2			2½			3			4		
Port size (inches)	-	-	-	3/4	1	1¼	1	1¼	1½	1¼	1½	2	1½	2	2½	2	2½	3
Rated Cv value	4.0	6.3	11	11	17	24	17	24	44	24	44	68	44	68	99	68	99	175
Rated travel (mm)	14.3			25						38								



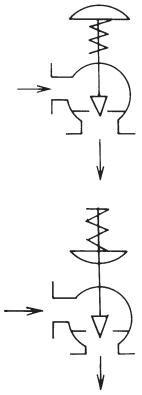
a. Equal percentage characteristics (%C) b. Linear characteristics (LC)

Figure 1 Flow characteristics

Allowable differential pressure

PTFE packing

Table 3 Air-to-close and Air-to-open



Actuator model No.	Supply pressure kPa {kgf/cm²}	Spring range kPa {kgf/cm²}	Positioner	Differential pressure (by Cv value or port size (inch) kPa {kgf/cm²})							
				Cv0.4 Cv6.3	3/4 Cv11	1	1¼	1½	2	2½	3
PSA1D, R	140 {1.4}	20 to 98 {0.2 to 1.0}	△	2040 {20.8}	2040 {20.8}	1110 {11.3}	510 {5.2}	340 {3.5}	—	—	—
	290 {3.0}	78 to 240 {0.8 to 240}	✔	3920 {40}	3920 {40}	2220 {22.6}	1020 {10.4}	690 {7.0}	—	—	—
HA2D, R	140 {1.4}	20 to 98 {0.2 to 1.0}	△	3920 {40}	3920 {40}	2150 {21.9}	990 {10.1}	670 {6.8}	400 {4.1}	240 {2.5}	180 {1.8}
	290 {3.0}	78 to 240 {0.8 to 240}	✔	3920 {40}	3920 {40}	3920 {40}	1970 {20.1}	1340 {13.7}	800 {8.2}	490 {5.0}	350 {3.6}
HA3D, R	140 {1.4}	20 to 98 {0.2 to 1.0}	△	—	—	3800 {38.8}	1760 {17.9}	1190 {12.1}	710 {7.2}	440 {4.5}	310 {3.2}
	290 {3.0}	78 to 240 {0.8 to 240}	✔			3920 {40}	3500 {35.7}	2370 {24.2}	1420 {14.5}	870 {8.9}	630 {6.4}
HA4D, R	140 {1.4}	20 to 98 {0.2 to 1.0}	△	—	—	—	3030 {30.9}	2050 {20.9}	1220 {12.5}	760 {7.7}	550 {5.6}
	290 {3.0}	78 to 240 {0.8 to 240}	✔				3920 {40}	3920 {40}	2450 {25}	1510 {15.4}	1090 {11.1}

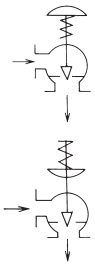
Note) 1) "▭" shows a model with standard-type actuator.

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

3) 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.

Graphite packing "P6610CH + P6528" (+230 to +500 °C)

Table 4 Air-to-close and Air-to-open



Actuator model No.	Supply pressure kPa {kgf/cm²}	Spring range kPa {kgf/cm²}	Positioner	Differential pressure (by Cv value or port size (inch) kPa {kgf/cm²})							
				Cv0.4 Cv6.3	3/4 Cv11	1	1¼	1½	2	2½	3
HA2D, R	290 {3.0}	80 to 240 {0.8 to 240}	✔	3920 {40}	3920 {40}	2930 {29.8}	1810 {18.4}	1220 {12.4}	730 {7.4}	450 {4.5	320 {3.2}
HA3D, R				—	—	—	3210 {32.7}	2180 {22.2}	1300 {13.2}	800 {8.1}	570 {5.8}
HA4D, R				—	—	—	3920 {40.0}	3840 {39.1}	2290 {23.3}	1410 {14.3}	1020 {10.4}

Note) 1) ✔ : Positioner is necessary.

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.

DIMENSIONS

Table 5 Face-to-face dimensions [Unit: mm]

Nominal size (inches)	A					
	JIS 10KFF, RF ANSI 150RF JPI 150RF	JIS 16KRF JIS 20KRF JIS 30KRF ANSI 300RF JPI 300RF	JIS 40KFF ANSI 600RF JPI 600RF	ANSI 150RJ JPI 150RJ	ANSI 300RJ JPI 300RJ	ANSI 600RJ JPI 600RJ
1	92	98	105	98	105	105
1½	111	117	125	117	124	125
2	127	133	143	133	141	144
2½	138	146	156	144	154	157
3	149	159	168	156	167	170
4	176	184	197	183	192	198

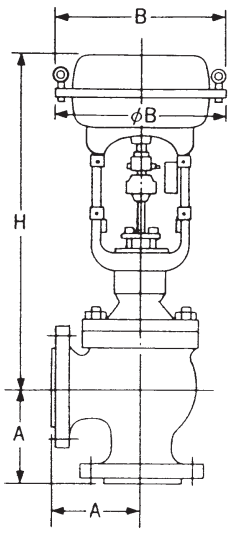


Figure 2 Face-to-face and external dimensions

Table 6 External dimensions [Unit: mm]

Nominal size (inches)	Actuator model No.	H		B	ϕB
		Plain bonnet	Extension bonnet		
1	PSA1D, R	431	586	230	218
	HA2D, R	465	620	281	267
1½	PSA1D, R	441	591	230	218
	HA2D, R	475	625	281	267
	HA3D, R	580	730	363	350
2	HA1D, R	400	550	230	218
	HA2D, R	475	625	281	267
	HA3D, R	580	730	363	350
2½	HA2D, R	545	695	281	267
	HA3D, R	600	750	363	350
	HA4D, R	840	990	520	470
3	HA2D, R	555	705	281	267
	HA3D, R	610	760	363	350
	HA4D, R	840	990	520	470
4	HA2D, R	555	710	281	267
	HA3D, R	610	765	363	350
	HA4D, R	845	995	520	470

Note) "H" dimensions are applicable when a hand wheel is not provided. When a hand wheel is used, add the dimensions of hand wheel specified on specification sheets (No.SS2-8213-0500 for Type HA).

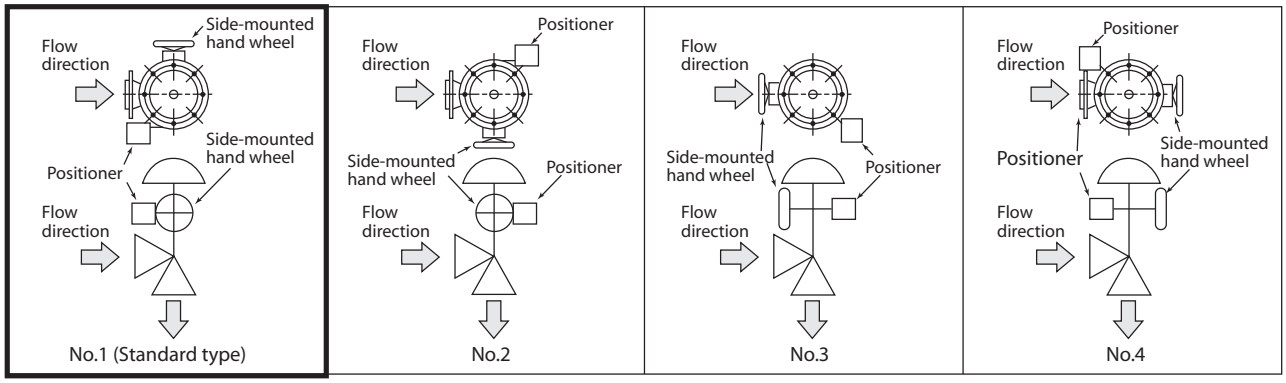


Figure 3 Actuator orientation

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

Ordering information

When ordering, please specify;

1) Model number: HAF
2) Nominal size × Port size
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 pressure to diaphragm
8) Valve action (direct or reverse)
9) Accessories (positioner, hand wheel, pressure regulator with filter and etc.)
10) Special requirement of degreasing, copper free treatment, 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

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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