

MANUAL HANDLE - ADG Series

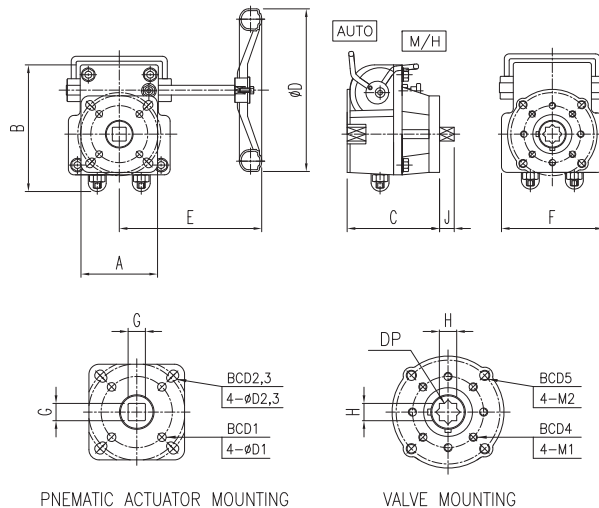


Features

- Direct Mounting
- High Power

Specification

Model	ADG050N	ADG070N	ADG102N	ADG140N
MAX. Output Torque	270 Nm	360 Nm	780 Nm	1300 Nm
Pneumatic Actuator Mounting Flange (ISO 5211)	F05 / F07	F07 / F10	F10 / F12	F10 / F12 / F14
Valve Mounting Flange (ISO 5211)	F05 / F07	F07 / F10	F10 / F12	F10 / F12
Reduction Ratio	40 : 1	38 : 1	36 : 1	50 : 1
Number Of Turns 90°	10 TURN	9.5 TURN	9 TURN	12.5 TURN
Handwheel Diameter	Ø200	Ø200	Ø280	Ø400
Weight	3.1 Kg	4.5 Kg	7.0 Kg	14.7 Kg
Application For Pneumatic Actuator	AS50/65 AD50/65/80	AS80 AD100/125	AS100 -	AS125 AD140/160



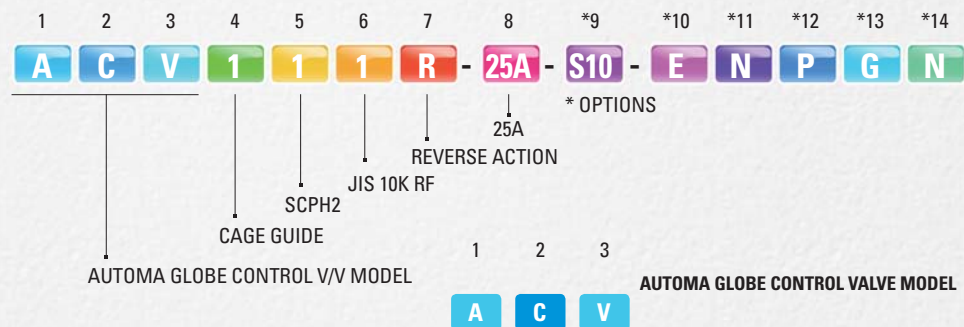
Dimension

Model	DIM										Pneumatic Actuator				Valve Mounting	
	A	B	C	ΦD	E	F	G (TOP)	J	H (BOTTOM)	DP	BCD1/2/3	4-ØD1/2	BCD4/5	4-ØM1/2		
ADG050N	70	131	103	200	151	88	14X14	16	17X17	20	Ø50/70	4-Ø6.5/8.5	Ø50/70	4-M6/M8		
ADG070N	95	161	114	200	178	125	17X17	18	17X17	20	Ø70/102	4-Ø8.5/10.5	Ø70/102	4-M8/M10		
ADG102N	114	182	130	280	220	140	22X22	24	22X22	30	Ø102/125	4-Ø10.5/12.5	Ø102/125	4-M10/M12		
ADG140N	129	231	167	400	290	187	22X22	24	27X27	30	Ø102/125/140	4-Ø11/12.5/16.6	Ø102/125	4-M10/M12		

GLOBE VALVE



MODEL SELECTION GUIDE



- 4**
- 1** **VALVE TYPE**
1: CAGE GUIDE
2: TOP GUIDE
- 5**
- 1** **VALVE MATERIAL**
1: SCPH2 (A216 WCB / DIN GS-52)
2: SCS13 (A351 CF8 / DIN 1.4308)
3: SCS14 (A351 CF8M / DIN 1.4408)
4: SCS16 (A351 CF3M / DIN 1.4404)
- 6**
- 1** **VALVE RATING & CONNECTION**
1: KS (JIS) 10K RF
2: KS (JIS) 20K RF
3: ANSI CL 150 RF
4: ANSI CL 300 RF
5: PN 16 RF
7: PN 40 RF
8: KS(JIS) 40K RF
9: ANSI CL 600 RF
10: KS(JIS) 63K RF
11: ANSI CL 900 RF
- 7**
- R** **ACTUATOR ACTION**
R: REVERSE ACTION
D: DIRECT ACTION
- 8**
- 25A** **VALVE SIZE**
15A (1/2B)
20A (3/4B)
25A (1B)
32A (1-1/4B)
40A (1-1/2B)
50A (2B)
65A (2-1/2B)
80A (3B)
100A (4B)
125A (5B)
150A (6B)
200A (8B)
250A (10B)
300A (12B)
- *9**
- S10** **Cv TRIM NO**
Cv TABLE
- *10**
- E** **PLUG OPTION**
Q: QUICK OPEN
E: EQ%
L: LINEAR
M: MODIFIED PARABOLIC
R: MICRO
C: ANTI CABITATION TRIM
N: ANTI NOISE TRIM
- *11**
- N** **SEAT MATERIAL OPTION**
N: METAL SEAT (SUS316L)
E: METAL SEAT (SUS304)
H: STELLITED TREAT. (SUS316L+STL)
41: METAL SEAT (SUS410)
42: METAL SEAT (SUS420+QT)
S1: SOFT SEAT (SUS316L+PTFE)
S2: SOFT SEAT (SUS316L+PEEK)
- *12**
- P** **BONNET OPTION**
P: PLAIN BONNET
B: BELLOWS BONNET
F: FIN BONNET
S: INSULATION FIN BONNET
E: EXTENTION BONNET
L: LONG EXTENTION BONNET
- *13**
- G** **PACKING OPTION**
G: GRAFOIL (FILLER 6710+6610)
V: V-PACKING(PTFE)
P: PTFE PACKING
- *14**
- N** **HANDLE POSITION**
N: NONE
T: TOP
S: SIDE

STANDARD SPECIFICATION

• Standard Type Of Automa Control Globe valve

Body	Actuator Type	Pneumatic Diaphragm, Pneumatic Cylinder, Electric Motor Other.
	Bonnet Type	Plain(Standard) Type, Fin & Extension Type, Bellows Seal Type, Long Bonnet Type
	Valve Type	Globe Valve (2-Way, 3-Way)
	Valve Size	15A ~ 300A (1/2B ~12B)
	Pressure Rating	JIS 10K~100K / ANSI CLASS 150~1500
	End Connections	Flanged(RF, FF, RTJ), Weld Ends (SW: until 2", BW: 2.5" over), Screw(until 2")
	Body Materials	Carbon Steel(WCB, WCC, SCPH2) Chrome-moly Steel(WC6, WC9) Stainless Steel(CF8, CF8M, SCS13, SCS14), Duplex Stainless Steel, Hastelloy
	Trim Materials	SUS316, SUS316L+ (STL), SUS410, SUS420, Duplex Stainless Steel, Hastelloy
	Operating Temperature	Standard : -20°C ~ 230°C Fin/Extension : -45°C ~ -20°C or 230°C ~ 380°C Long-Extension : -196°C ~ -45°C or 380°C ~ 500°C
	Guide Type	Top(Unbalance) Guide & Cage(Balance) Guide
	Gland Packing Type	V-PTFE(Standard), PTFE yarn, Graphite yarn
	Gasket Type	SUS316 + Graphite spiral wound, 316+TFE spiral wound or other composite Gasket
	Painting Color	Standard is Silver. In the case of stainless steel, Body is not painted.
	Plug Characteristics	Equal percentage, Linear, Modified Parabolic
Performance	Valve Action	Reverse action, Direct action
	Rangeability	30:1, 50:1, 80:1, 100:1
	Action	Hysteresis (Without positioner) max. 4% F.S., (With positioner) max. 1% F.S.
	Accuracy	Linearity (Without positioner) max. ±5% F.S., (With positioner) max. ±1% F.S.
Performance	Leakage	See the "ALLOWABLE SEAT LEAKAGE" page.

• Piping Class Ratings - Classes and Pressure Numbers (PN)

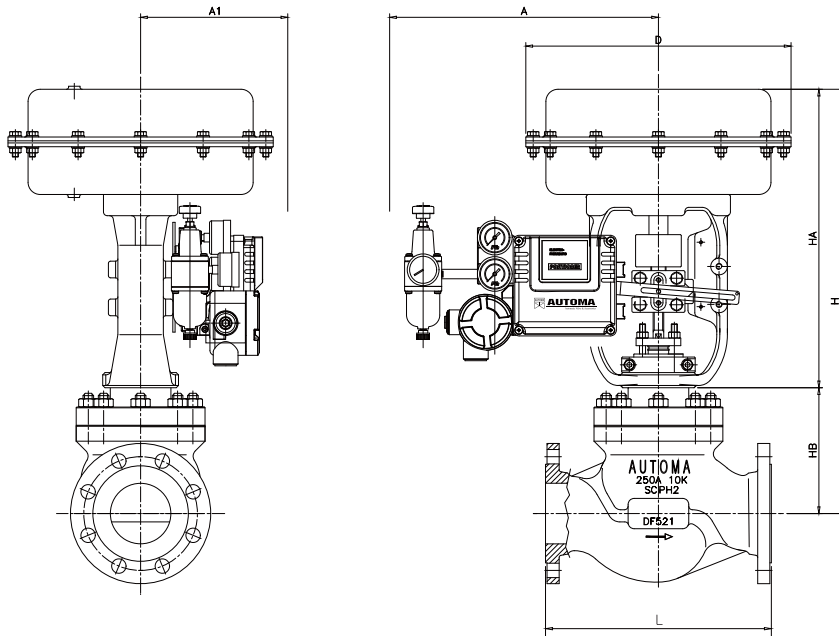
Piping Class Ratings based on ASME B16.5 and corresponding PN (Pression Nominal/Pressure Nominal):

Flange Class	150	300	400	600	900	1500	2500
Flange Pressure Nominal, PN	20	50	68	100	150	250	420
Jis Ks flange code	5,10,15	20,30		40	63	100	

GLOBE VALVE ASSEMBLY DIMENSIONS

KS/ JIS 10K RF , ANSI CL150LB RF

MODEL : ACV



- Actuator Acting : Reverse, Direct
- Operating Media : Compressed Dry Air
- IN-PUT Signal : DC 4~20mA
- Fluid Temp : -20°C ~ 230°C
- End Connection : KS 10K(JIS 10K) ANSI CL 150LB
- Accessories : E/P Positioner, Air Set

Dimension

• Face To Face : ISA S75.03-1992 (Unit: mm)

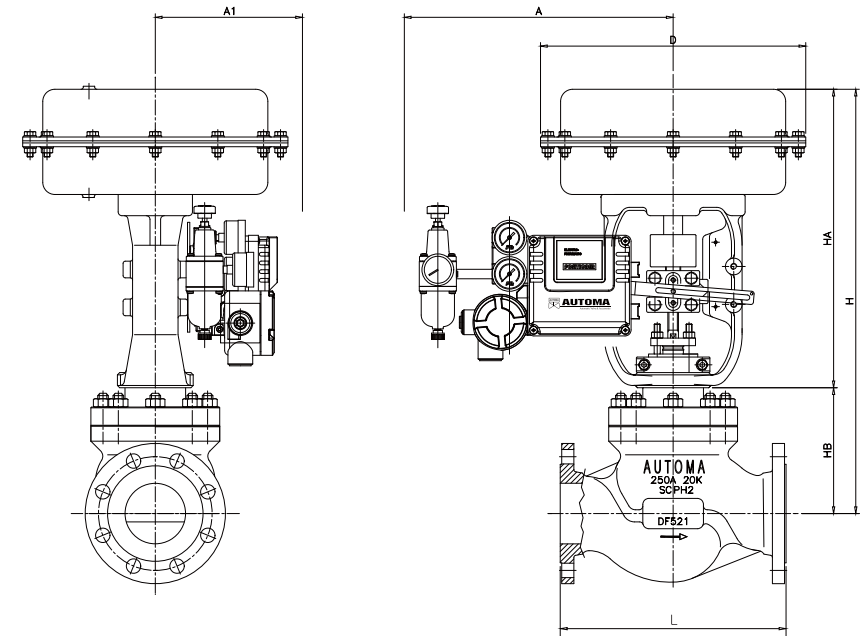
Size		Stroke	L	Approx.						Weight (Kg)
mm	Inch			H	HA	HB	D	A	A1	
15	1/2	20	184	390	280	110	220	250	140	13
20	3/4	20	184	390	280	110	220	250	140	13
25	1	20	184	390	280	110	220	250	140	16
32	1-1/4	25	222	435	320	115	270	260	140	22
40	1-1/2	25	222	435	320	115	270	260	140	22
50	2	25	254	445	320	125	270	260	140	28
65	2-1/2	30	276	535	395	140	350	270	160	48
80	3	40	298	565	395	170	350	270	160	61
100	4	40	352	585	395	190	350	270	160	69
125	5	50	403	780	500	280	470	300	250	155
150	6	50	451	785	500	285	470	300	250	175
200	8	75	543	890	535	355	470	300	250	280
250	10	75	673	960	535	425	470	300	250	350
300	12	120	737	1425	928	497	470	-	-	-

• The actuator type for 300A Globe is spring return cylinder.

GLOBE VALVE ASSEMBLY DIMENSIONS

KS/ JIS 20K RF , ANSI CL300LB RF

MODEL : ACV



- Actuator Acting : Reverse, Direct
- Operating Media : Compressed Dry Air
- IN-PUT Signal : DC 4~20mA
- Fluid Temp : -20°C ~ 230°C
- End Connection : KS 20K(JIS 20K) ANSI CL 300LB
- Accessories : E/P Positioner, Air Set

Dimension

• Face To Face : ISA S75.03-1992 (Unit: mm)

Size		Stroke	L	Approx.						Weight (Kg)
mm	Inch			H	HA	HB	D	A	A1	
15	1/2	20	194	390	280	110	220	250	140	13
20	3/4	20	194	390	280	110	220	250	140	13
25	1	20	197	390	280	110	220	250	140	16
32	1-1/4	25	235	435	320	115	270	260	140	25
40	1-1/2	25	235	435	320	115	270	260	140	25
50	2	25	267	445	320	125	270	260	140	31
65	2-1/2	30	292	535	395	140	350	270	160	51
80	3	40	318	565	395	170	350	270	160	62
100	4	40	368	585	395	190	350	270	160	75
125	5	50	425	780	500	280	470	300	250	162
150	6	50	473	785	500	285	470	300	250	180
200	8	75	568	890	535	355	470	300	250	290
250	10	75	708	960	535	425	470	300	250	360
300	12	120	775	1425	928	497	470	-	-	-

• The actuator type for 300A Globe is spring return cylinder.

GENERAL CONTROL GLOBE VALVE SERIES

MODEL : ACV 1005W (CASTING PLAIN BONNET TYPE)

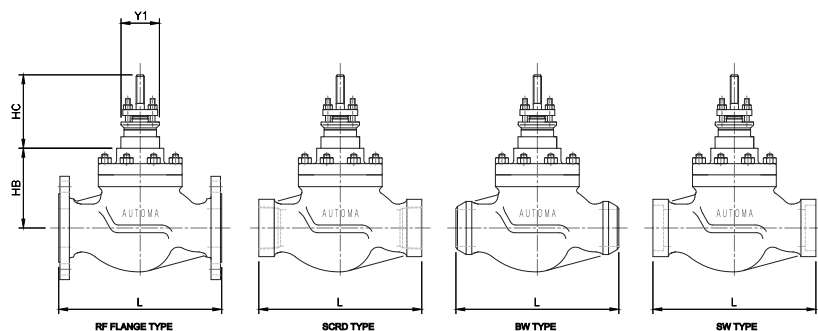
Constructions

- Single Seated Top Guide Type: 15A ~ 65A(#150, #300, #600)
- Single Seated CAGE Guide Type: 25A ~ 300A(#600, #900)

The ACV 1005W Series Valve is applied for various fluids control of Water, Steam, and Gas etc, of which production and maintenance efficiency is excellent with the application of standardized parts.

In general, the Cage Guide product is not suitable for the dust containing fluids, but the ACV 1005W Series Valve Cage Guide is manufactured as a model which minimized the influence of dust.

* Full Port & Reduced Port may be equipped, and it is designed to be suitable for various fluids control of Fluid, Steam, Gas etc. Various Trims such as Quick Open, Equal%, Linear, Modified% etc. may be equipped, which are necessary for the control of Custom-engineered Cavitation, Noise, and Flushing.



Dimension

Size		L							
		RF			SCRD			BW	SW
mm(A)	Inch(B)	#150	#300	#600	#150	#300	#600	#150,300,600	#150,300,600
15	1/2	184	194	206	184	194	206	206	206
20	3/4	184	194	206	184	194	206	206	206
25	1	184	197	210	184	197	210	210	210
32	1-1/4	222	235	251	222	235	251	251	251
40	1-1/2	222	235	251	222	235	251	251	251
50	2	254	267	286	254	267	286	286	286
65	2-1/2	276	292	311	-	-	-	311	311
80	3	298	318	337	-	-	-	317	317
100	4	352	368	394	-	-	-	368	368
125	5	403	425	457	-	-	-	460	460
150	6	451	473	508	-	-	-	508	508
200	8	543	568	610	-	-	-	610	610
250	10	673	708	752	-	-	-	752	752
300*	12	737	775	819	-	-	-	920	920

* The actuator type for 300A Globe is spring return cylinder.

Valve Size	:	15A ~ 300A
Body Type	:	Globe Valve
Bonnet Type	:	Plain Bolted Bonnet Design
End Connection	:	RF, BW, SW, SCRD
Pressure Rating	:	KS(JIS)10K~63K, ANSI 150#~1500#
Flow Direction	:	Under The Web(#150, #300) Over The Web(#600)
Fluid Temp	:	-20°C ~ 230°C
Characteristic	:	Equal%, Linear, Modified%, Custom-engineered
Velocity Control Trim	:	Micro Port, P-Port, C-Port, Multi-Hole(1,2,3) Others
Flow Coefficient Cv	:	Refer to Cv TABLE
Actuator Type	:	Diaphragm, Diaphragm Cylinder, Cylinder, Motor, Hydraulic
Actuator Acting	:	Reverse, Direct
Face to Face	:	#150, #300 ISA S75.03-1992 #600 ISA S75.15-1992

HB	HC	Y1	HB	HC	Y1	Weight (Kg)			Size	
Approx.			Approx.						Inch(B)	mm(A)
#150, 300			#600			#150 RF	#300 RF	#600 RF		
110	105	50	150	115	50	13	13	15	1/2	15
110	105	50	150	115	50	13	13	15	3/4	20
110	105	50	185	115	50	16	16	18.5	1	25
115	105	50	197	115	50	22	24	26	1-1/4	32
115	105	50	197	115	50	22	25	27	1-1/2	40
125	105	50	197	115	50	28	30	34	2	50
140	125	65.5	263	141	65.5	48	52	58	2-1/2	65
170	125	65.5	300	141	65.5	61	66	72	3	80
190	125	65.5	316	141	65.5	69	72	78	4	100
280	145	82	409	141	82	155	165	185	5	125
285	145	82	409	141	82	175	182	210	6	150
355	145	82	420	141	100	280	305	325	8	200
425	145	82	460	141	100	350	365	405	10	250
497	-	-	-	-	-	-	-	-	12	300*

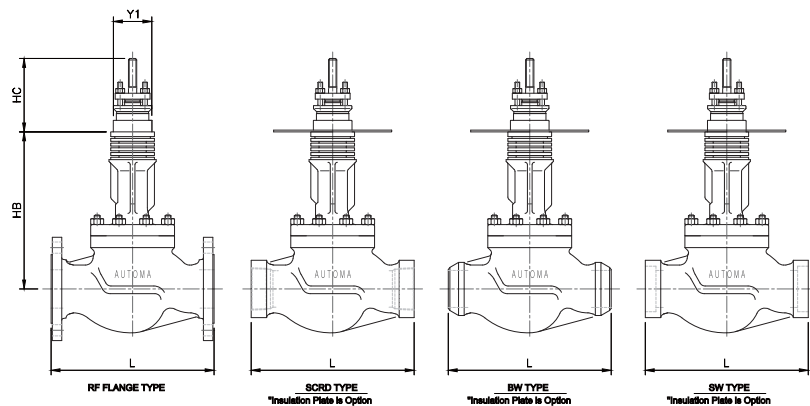
(Unit: mm)

FIN BONNET TYPE GLOBE VALVE SERIES

MODEL : ACV 1006W (FIN BONNET TYPE)

• Fluid Temp : 230°C ~ 380°C, -20°C ~ -45°C

The ACV 1006W Series is designed to be suitably for the characteristics of high temperature and low temperature, with minimized damage of the packing part, of which Insulation Plate is an option, and the maintenance efficiency is excellent with the application of standardized parts. The kind and quality of materials of the Grand Packing and Balance Seal are changed according to the temperature and fluid used.



Dimension

(Unit: mm)

HB	HC	Y1	HB	HC	Y1	Weight (Kg)			Size	
Approx.			Approx.						Inch(B)	mm(A)
#150, 300			#600			#150 RF	#300 RF	#600 RF		
216	105	50	350	115	50	15.6	15.6	18	1/2	15
216	105	50	350	115	50	15.6	15.6	18	3/4	20
223	105	50	385	115	50	19.2	19.2	22.2	1	25
237	105	50	397	115	50	26.4	28.8	31.2	1-1/4	32
237	105	50	397	115	50	26.4	30	32.4	1-1/2	40
255	105	50	397	115	50	33.6	36	40.8	2	50
270	125	65.5	463	141	65.5	57.6	62.4	69.6	2-1/2	65
351	125	65.5	500	141	65.5	73.2	79.2	86.4	3	80
403	125	65.5	516	141	65.5	82.8	86.4	93.6	4	100
470	145	82	609	141	82	186	198	222	5	125
480	145	82	609	141	82	210	218.4	252	6	150
580	145	82	620	141	100	336	366	390	8	200
620	145	82	660	141	100	420	438	486	10	250
-	-	-	-	-	-	0	0	0	12	300*

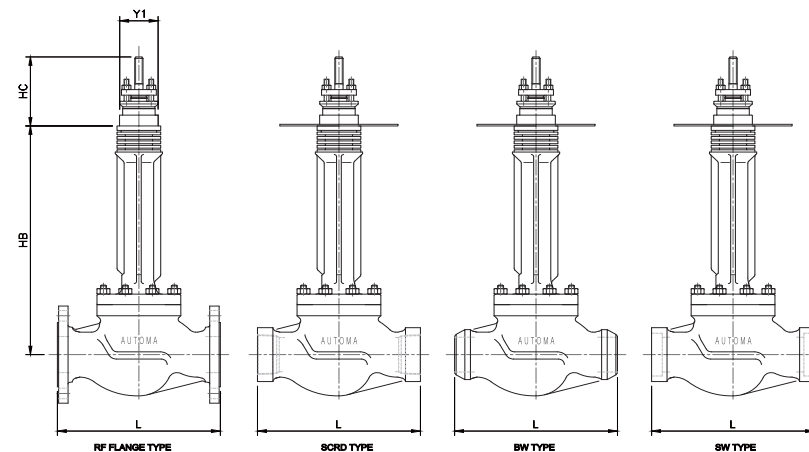
* The actuator type for 300A Globe is spring return cylinder.

LONG EXTENSION BONNET TYPE GLOBE VALVE SERIES

MODEL : ACV 1007W (CASTING LONG EXTENSION BONNET TYPE)

• Fluid Temp : 380°C ~ 500°C, -45°C ~ -196°C

The ACV 1007W Series is a product of Long Extension Bonnet suitably designed for the ultrahigh temperature, and ultralow temperature fluids. Choosing the proper material is important. Internal & external abrasion resistance and thermal expansion coefficient should be considered carefully. It is designed to diminish the mechanical vibration and to have stable feature by minimizing the required gap between Plug and Case.



Dimension

(Unit: mm)

HB	HC	Y1	HB	HC	Y1	Weight (Kg)			Size	
Approx.			Approx.						Inch(B)	mm(A)
#150, 300			#600			#150 RF	#300 RF	#600 RF		
460	105	50	500	115	50	20.8	20.8	24	1/2	15
460	105	50	500	115	50	20.8	20.8	24	3/4	20
460	105	50	535	115	50	25.6	25.6	29.6	1	25
465	105	50	547	115	50	35.2	38.4	41.6	1-1/4	32
465	105	50	547	115	50	35.2	40	43.2	1-1/2	40
475	105	50	547	115	50	44.8	48	54.4	2	50
490	125	65.5	613	141	65.5	76.8	83.2	92.8	2-1/2	65
520	125	65.5	650	141	65.5	97.6	105.6	115.2	3	80
540	125	65.5	666	141	65.5	110.4	115.2	124.8	4	100
630	145	82	759	141	82	248	264	296	5	125
635	145	82	759	141	82	280	291.2	336	6	150
705	145	82	770	141	100	448	488	520	8	200
775	145	82	810	141	100	560	584	648	10	250
-	-	-	-	-	-	0	0	0	12	300*

* The actuator type for 300A Globe is spring return cylinder.

BELLOWS-SEAL GLOBE VALVE SERIES

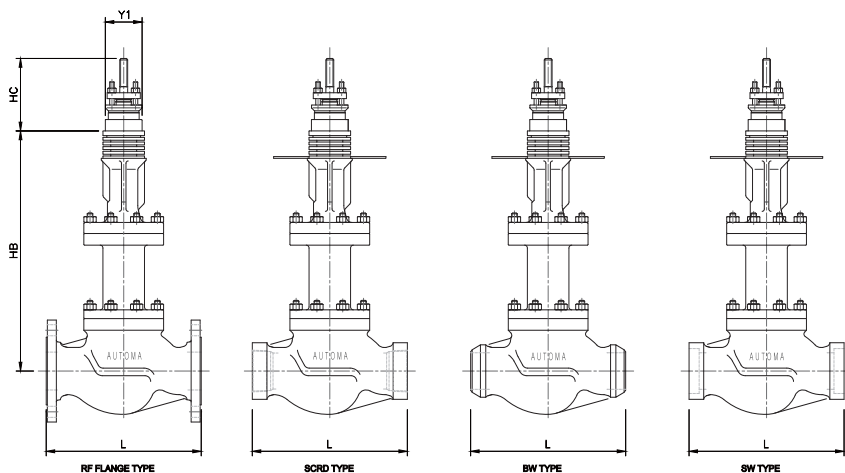
MODEL : ACV 3000W (CASTING BELLOWS BONNET TYPE)

Constructions

- Single Seated Top Guide Type: 15A ~ 65A(#150, #300, #600)
- Single Seated CAGE Guide Type: 25A ~ 300A(#600, #900)

The ACV 3000W Series is developed for complete confidentiality, and is excellent in fast maintenance and confidentiality with the BELLOWS equipped for the STEM of TRIM PART in Cartridge type.

* Full Port & Reduced Port may be equipped, and it is suitably designed for various fluids control of Heating Medium Oil, Hydrothermal, Toxic Gas etc. Various Trims such as Quick Open, Equal%, Linear, Modified% etc. may be equipped, which are necessary for the control of Custom-engineered Cavitation, Noise, and Flushing.



Dimension

Size		L							
		RF			SCRD			BW	SW
mm(A)	Inch(B)	#150	#300	#600	#150	#300	#600	#150,300,600	#150,300,600
15	1/2	184	194	206	184	194	206	206	206
20	3/4	184	194	206	184	194	206	206	206
25	1	184	197	210	184	197	210	210	210
32	1-1/4	222	235	251	222	235	251	251	251
40	1-1/2	222	235	251	222	235	251	251	251
50	2	254	267	286	254	267	286	286	286
65	2-1/2	276	292	311	-	-	-	311	311
80	3	298	318	337	-	-	-	317	317
100	4	352	368	394	-	-	-	368	368
125	5	403	425	457	-	-	-	460	460
150	6	451	473	508	-	-	-	508	508
200	8	543	568	610	-	-	-	610	610
250	10	673	708	752	-	-	-	752	752
300*	12	737	775	819	-	-	-	920	920

* The actuator type for 300A Globe is spring return cylinder.

Valve Size	:	15A ~ 300A
Body Type	:	Globe Valve
Bonnet Type	:	Bellows Bonnet Design
End Connection	:	RF, BW, SW
Pressure Rating	:	KS(JIS) 10K, 20K, 30K, ANSI 150, 300, 600
Flow Direction	:	Under The Web(#150, #300) Over The Web(#600)
Fluid Temp	:	-100°C ~ 380°C
Characteristic	:	Equal%, Linear, Modified%, Custom-engineered
Velocity Control Trim	:	Micro Port, P-Port, C-Port, Multi-Hole(1,2,3) Others
Flow Coefficient Cv	:	Refer to Cv TABLE
Actuator Type	:	Diaphragm, Diaphragm Cylinder, Cylinder, Motor, Hydraulic
Actuator Acting	:	Reverse, Direct
Face to Face	:	#150, #300 ISA S75.03-1992 #600 ISA S75.15-1992

(Unit: mm)

HB	HC	Y1	HB	HC	Y1	Weight (Kg)			Size	
Approx.			Approx.						Inch(B)	mm(A)
#150, 300			#600			#150 RF	#300 RF	#600 RF		
366	105	50	500	115	50	22.1	22.1	25.5	1/2	15
366	105	50	500	115	50	22.1	22.1	25.5	3/4	20
373	105	50	535	115	50	27.2	27.2	31.45	1	25
387	105	50	547	115	50	37.4	40.8	44.2	1-1/4	32
387	105	50	547	115	50	37.4	42.5	45.9	1-1/2	40
405	105	50	547	115	50	47.6	51	57.8	2	50
420	125	65.5	613	141	65.5	81.6	88.4	98.6	2-1/2	65
501	125	65.5	650	141	65.5	103.7	112.2	122.4	3	80
553	125	65.5	666	141	65.5	117.3	122.4	132.6	4	100
620	145	82	759	141	82	263.5	280.5	314.5	5	125
630	145	82	759	141	82	297.5	309.4	357	6	150
730	145	82	770	141	100	476	518.5	552.5	8	200
770	145	82	810	141	100	595	620.5	688.5	10	250
-	-	-	-	-	-	0	0	0	12	300*

3-WAY GLOBE VALVE SERIES (DIVIDING & MIXING)

MODEL : ACV 1305W (CASTING 3WAY PLAIN BONNET TYPE)

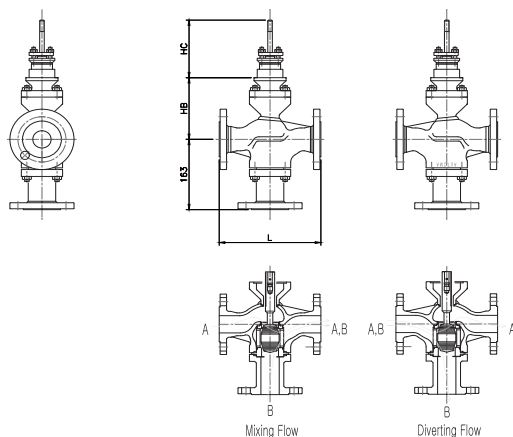
Constructions

- Single Seated Top Guide Type : 15A ~ 65A(#150, #300, #600)
- Single Seated CAGE Guide Type : 25A ~ 300A(#600, #900)

The ACV 1305W Series is a model for which Precise Flow Control TRIM is applied, and the ACV 1305W SERIES VALVE is applied for various fluids control of Water, Steam & Gas etc., and is suitably designed for the Mixing, and Diverting of Fluids. The production and maintenance efficiency of this product is excellent with the application of the standardized parts.

The damage of the Packing Parts is minimized for this product. The production and maintenance efficiency of this product is excellent with the application of the standardized parts.

* Full Port & Reduced Port may be equipped, and it is suitably designed for various fluids control of Fluid, Steam, Gas etc. Various Trims such as Quick Open, Equal%, Linear, Modified% etc. may be equipped, which are necessary for the control of Custom-engineered Cavitation, Noise, and Flushing.



Dimension

Size		L							
		RF			SCRD			BW	SW
mm(A)	Inch(B)	#150	#300	#600	#150	#300	#600	#150,300,600	#150,300,600
15	1/2	184	194	206	184	194	206	206	206
20	3/4	184	194	206	184	194	206	206	206
25	1	184	197	210	184	197	210	210	210
32	1-1/4	222	235	251	222	235	251	251	251
40	1-1/2	222	235	251	222	235	251	251	251
50	2	254	267	286	254	267	286	286	286
65	2-1/2	276	292	311	-	-	-	311	311
80	3	298	318	337	-	-	-	317	317
100	4	352	368	394	-	-	-	368	368
125	5	403	425	457	-	-	-	460	460
150	6	451	473	508	-	-	-	508	508
200	8	543	568	610	-	-	-	610	610
250	10	673	708	752	-	-	-	752	752
300*	12	737	775	819	-	-	-	920	920

* The actuator type for 300A Globe is spring return cylinder.

Valve Size	:	15A ~ 300A
Body Type	:	Globe Valve
Bonnet Type	:	Plain Bonnet Design
End Connection	:	RF, BW, SW, SCRD
Pressure Rating	:	KS(JIS) 10K, 20K, 30K, ANSI 150, 300, 600
Flow Direction	:	Under The Web(#150, #300) Over The Web(#600)
Fluid Temp	:	-20°C ~ 230°C
Characteristic	:	Quick open, Linear Custom-engineerd
Velocity Control Trim	:	Micro Port, P-Port, C-Port, Multi-Hole(1,2,3) Others
Flow Coefficient Cv	:	Refer to Cv TABLE
Actuator Type	:	Diaphragm, Diaphragm Cylinder, Cylinder, Motor, Hydraulic
Actuator Acting	:	Reverse, Direct
Face to Face	:	#150, #300 ISA S75.03-1992 #600 ISA S75.15-1992

HA	HB	HC	Y1	HA	HB	HC	Y1	Weight (Kg)			Size	
Approx.				Approx.				#150 RF	#300 RF	#600 RF	Inch(B)	mm(A)
#150, 300				#600								
110	110	105	50	110	150	115	50	16.9	16.9	19.5	1/2	15
110	110	105	50	110	150	115	50	16.9	16.9	19.5	3/4	20
110	110	105	50	110	185	115	50	20.8	20.8	24.05	1	25
115	115	105	50	115	197	115	50	28.6	31.2	33.8	1-1/4	32
115	115	105	50	115	197	115	50	28.6	32.5	35.1	1-1/2	40
125	125	105	50	125	197	115	50	36.4	39	44.2	2	50
140	140	125	65.5	140	263	141	65.5	62.4	67.6	75.4	2-1/2	65
170	170	125	65.5	170	300	141	65.5	79.3	85.8	93.6	3	80
190	190	125	65.5	190	316	141	65.5	89.7	93.6	101.4	4	100
280	280	145	82	280	409	141	82	201.5	214.5	240.5	5	125
285	285	145	82	285	409	141	82	227.5	236.6	273	6	150
355	355	145	82	355	420	141	100	364	396.5	422.5	8	200
425	425	145	82	425	460	141	100	455	474.5	526.5	10	250
497	497	-	-	497	-	-	-	0	0	0	12	300*

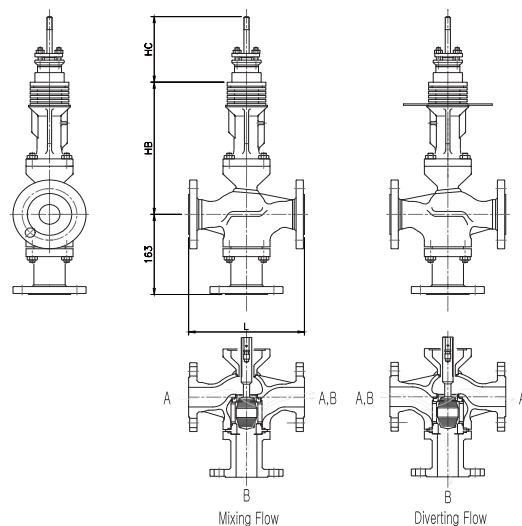
(Unit: mm)

FIN BONNET TYPE 3-WAY GLOBE VALVE SERIES

MODEL : ACV 1306W (CASTING 3WAY FIN BONNET TYPE)

• Fluid Temp : 230°C ~ 380°C, -20°C ~ -45°C

The ACV 1306W Series is a product which minimized the damage of the Packing Parts according to the high temperature and low temperature characteristics, and is a model for which Precise Flow Control TRIM is applied, and is suitably designed for the Mixing, and Diverting of Fluids. The kind and quality of materials of the Gland Packing and the Balance Seal are changed according to the temperature used.



Dimension

(Unit: mm)

HA	HB	HC	Y1	HA	HB	HC	Y1	Weight (Kg)			Size	
Approx.				Approx.								
#150, 300				#600				#150 RF	#300 RF	#600 RF	Inch(B)	mm(A)
110	216	105	50	110	350	115	50	19.5	19.5	22.5	1/2	15
110	216	105	50	110	350	115	50	19.5	19.5	22.5	3/4	20
110	223	105	50	110	385	115	50	24	24	27.75	1	25
115	237	105	50	115	397	115	50	33	36	39	1-1/4	32
115	237	105	50	115	397	115	50	33	37.5	40.5	1-1/2	40
125	255	105	50	125	397	115	50	42	45	51	2	50
140	270	125	65.5	140	463	141	65.5	72	78	87	2-1/2	65
170	351	125	65.5	170	500	141	65.5	91.5	99	108	3	80
190	403	125	65.5	190	516	141	65.5	103.5	108	117	4	100
280	470	145	82	280	609	141	82	232.5	247.5	277.5	5	125
285	480	145	82	285	609	141	82	262.5	273	315	6	150
355	580	145	82	355	620	141	100	420	457.5	487.5	8	200
425	620	145	82	425	660	141	100	525	547.5	607.5	10	250
497	-	-	-	497	-	-	-	0	0	0	12	300*

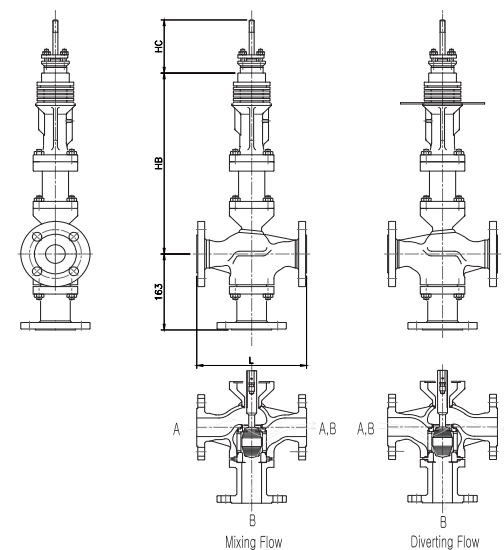
* The actuator type for 300A Globe is spring return cylinder.

BELLOWS-SEAL 3-WAY GLOBE VALVE SERIES

MODEL : ACV 3300W (CASTING 3WAY BELLOWS BONNET TYPE)

• Fluid Temp : -100°C ~ 380°C

The ACV 3300W SERIES is developed for complete confidentiality, and is excellent in fast maintenance and confidentiality with the BELLOWS equipped for the STEM of TRIM PART in Cartridge type. It is a product which minimized the damage of the Packing Parts according to the high temperature and low temperature characteristics, and is a model for which Precise Flow Control TRIM is applied, and is suitably designed for the Mixing, and Diverting of Fluids. The kind and quality of materials of the Gland Packing and Balance Seal are changed according to the temperature used.



Dimension

(Unit: mm)

HA	HB	HC	Y1	HA	HB	HC	Y1	Weight (Kg)			Size	
Approx.				Approx.								
#150, 300				#600				#150 RF	#300 RF	#600 RF	Inch(B)	mm(A)
110	366	105	50	110	500	115	50	22.1	22.1	25.5	1/2	15
110	366	105	50	110	500	115	50	22.1	22.1	25.5	3/4	20
110	373	105	50	110	535	115	50	27.2	27.2	31.45	1	25
115	387	105	50	115	547	115	50	37.4	40.8	44.2	1-1/4	32
115	387	105	50	115	547	115	50	37.4	42.5	45.9	1-1/2	40
125	405	105	50	125	547	115	50	47.6	51	57.8	2	50
140	420	125	65.5	140	613	141	65.5	81.6	88.4	98.6	2-1/2	65
170	501	125	65.5	170	650	141	65.5	103.7	112.2	122.4	3	80
190	553	125	65.5	190	666	141	65.5	117.3	122.4	132.6	4	100
280	620	145	82	280	759	141	82	263.5	280.5	314.5	5	125
285	630	145	82	285	759	141	82	297.5	309.4	357	6	150
355	730	145	82	355	770	141	100	476	518.5	552.5	8	200
425	770	145	82	425	810	141	100	595	620.5	688.5	10	250
497	-	-	-	497	-	-	-	0	0	0	12	300*

* The actuator type for 300A Globe is spring return cylinder.

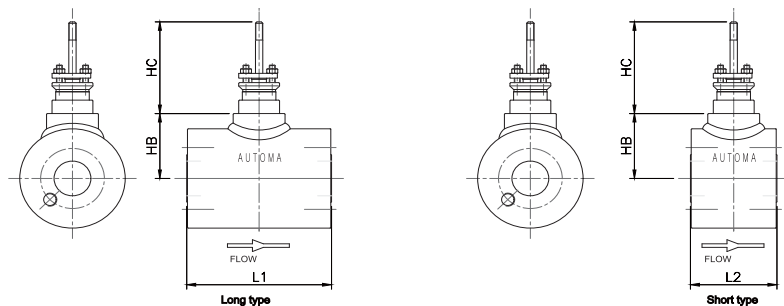
TEFLON GLOBE VALVE SERIES

MODEL : ACV 9005S (PTFE VALVE TYPE)

Constructions

- Single Seated Top Guide Type : 15A ~ 65A(#150, #300)
- Single Seated CAGE Guide Type : 25A ~ 300A(#150, #300)

ACV 9005S SERIES is a model suitable for the corrosive fluids, and is designed to have the corrosion resistant performance by using the STAINLESS as the housing material and by using the PTFE rod for the inner part to keep the hardness. The Pressure Balance Maintenance Type is applied for the inner part of the TRIM Part in order to fundamentally block the leakage of the used fluid.



Dimension

Size		L			
		LONG		SHORT	
mm(A)	Inch(B)	#150	#300	#150	#300
15	1/2	184	194	120	120
20	3/4	184	194	120	120
25	1	184	197	120	120
32	1-1/4	222	235	200	200
40	1-1/2	222	235	200	200
50	2	254	267	200	200

Valve Size	:	15A ~ 300A
Body Type	:	Globe Valve
Bonnet Type	:	Lug Bonnet Design
End Connection	:	Wafer Tap Type
Pressure Rating	:	KS(JIS) 10K, 20K, 30K, ANSI 150, 300, 600
Flow Direction	:	Under The Web(#150, #300)

Fluid Temp	:		Melting Point	Max Using Temp	Range of Temp
		PTFE	327	260	-200°C ~ 230°C
		PCTFE	210	190	-50°C ~ 180°C
		PFA	300-310	260	-190°C ~ 260°C

Characteristic	:	Equal%, Linear, Modified%, Custom-engineerd
Velocity Control Trim	:	Micro Port, P-Port
Flow Coefficient Cv	:	Refer to Cv TABLE

Actuator Type	:	Diaphragm, Diaphragm Cylinder, Cylinder, Motor, Hydraulic
Actuator Acting	:	Reverse, Direct

Face to Face	:	#150, #300 ISA S75.03-1992
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			Weight (Kg)		Size	
HB			HC		Y1	
Approx.			#150, 300		#150 RF, #300 RF	
					Inch(B), mm(A)	
110	105	50	6.5	6.5	1/2	15
110	105	50	6.5	6.5	3/4	20
110	105	50	8	8	1	25
115	105	50	11	12	1-1/4	32
115	105	50	11	12.5	1-1/2	40
125	105	50	14	15	2	50

(Unit: mm)

Cv TABLE

Globe Valve Flow Coefficients Rated Cv Chart - Micro Trim Cv (Unbalance Type, Top Guide)

Valve Size	Travel (mm)	Port	Trim NO.																				
			A22	A21	A20	A19	A17	A16	A15	A14	A13	S2.7	S3.3	S3.6	S3.6F	S4.1	S4.5	S4.5F	S5.3	S5.3F	S6.3	S6.3F	S7.5
15A	20	SINGLE	0.015	0.02	0.03	0.04	0.06	0.08	0.10	0.12	0.15	0.20	0.25	0.30	0.35	0.40	0.50	0.60	0.70	0.85	1.00	1.20	1.5
20A	20	SINGLE										0.20	0.25	0.30	0.35	0.40	0.50	0.60	0.70	0.85	1.00	1.20	1.5
Characteristic		:	Linear										Equal%, Linear, Modified%										

Globe Valve Flow Coefficients Rated Cv Chart 1 (Unbalance Type, Top Guide)

Characteristic : *Equal%, Linear, Modified%

Valve Size	Travel (mm)	Port	Trim NO.																				
			S7.5F	S8.6	S10	S11	S11.5	S12.5	S14	S15	S15F	S20	S20F	S25	S25F	S32	S32F	S40	S40F	S50	S50F	S65	S65F
15A	20	SINGLE	1.8	2.0	2.7	3.0	3.6	4.0	5.0	6.0	7.5												
20A	20	SINGLE	1.8	2.0	2.7	3.0	3.6	4.0	5.0	6.0	7.5	9.0	12.0										
25A	20	SINGLE							5.0	6.0	7.5	9.0	12.0	14.0	18.0								
32A	25	SINGLE								6.0	7.5	9.0	12.0	14.0	18.0	25.0	29.0						
40A	25	SINGLE										9.0	12.0	14.0	18.0	25.0	29.0	33.0	40.0				
50A	25	SINGLE												14.0	18.0	25.0	29.0	33.0	40.0	50.0	65.0		
65A	30	SINGLE														25.0	29.0	37.0	40.0	50.0	65.0	85.0	102.0

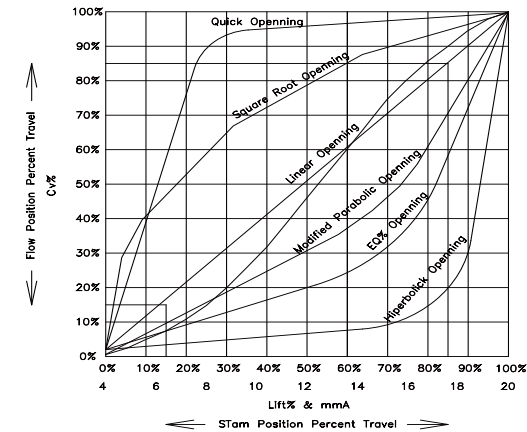
Globe Valve Flow Coefficients Rated Cv Chart 2 (Balance Type, Cage Guide)

Characteristic : *Equal%, Linear, Modified%

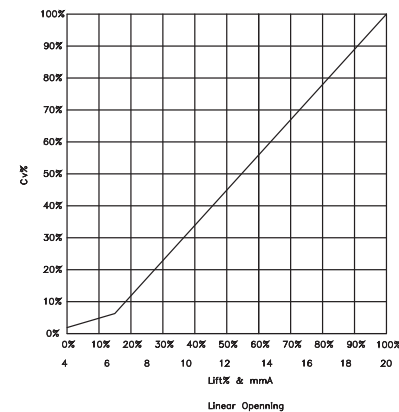
Valve Size	Travel (mm)	Trim No. Port	S80		S100		S125		S150		S200		S250		S300	
			4Port	3Port	4Port	3Port	6Port	5Port	4Port	3Port	8Port	6Port	4Port	8Port	6Port	8Port
80A	40		106	90												
100A	40				175	149										
125A	50						266									
150A	50							335	284	212						
200A	75										660	580	388			
250A	75												945	750		
300A	120															1500

GLOBE VALVE FLOW CHARACTERISTICS

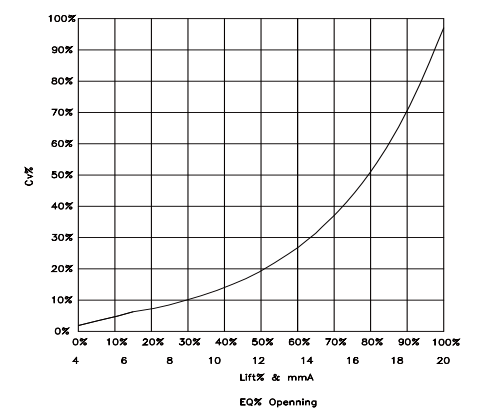
In Herrent Flow Characteristics for Common Valve Trim Design



Automa STD' Linear Flow Characteristics Curve

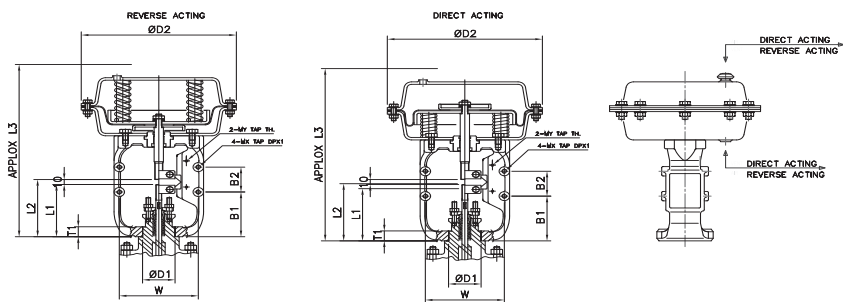


Automa STD' EQ% Flow Characteristics Curve



SINGLE ACTING DIAPHRAGM ACTUATOR SERIES

MODEL : ACV ALDR-N, ACV ALDD-N (General Pneumatic Actuator)



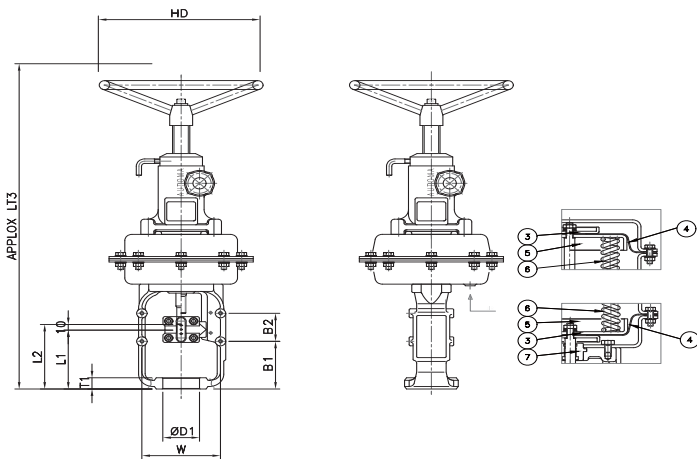
Dimension

Model	ØD1 +0.1~+0.3	ØD2	T1	L1	L2	L3	L3H	W	B1	B2
220	56	220	20	105	115	290	500	120	85	50
270	56	270	20	105	115	345	700	136	90	50
350	65.5	350	20	125	135	420	850	160	110	50
470	80	470	24	145	155	525	1150	235	130	50

- Operating Spring Range : 1.0bar ~ 2.4bar / 0.8bar ~ 2.4bar
- Supply Pressure : Revers Act. 1.0bar ~ 3.0bar
Direct Act. 1.0bar ~ 3.0bar
- Operating Speed : One Cycle(open to close) 3 to 15sec
- Air Signal Connection : PT 1/4
- Ambient Temperature : -40°C to +93°C
- Main Part Material : Diaphragm / EPDM
Spring / SWOCS-V
Yoke / FCD45
Diaphragm Casing / C.Steel plate
Diaphragm Rod / 304SS
- Color : HJ BLUE

TOP HANDLE (OPTION)

MODEL : ACV ALDR-T, ACV ALDD-T (General Top Handle Pneumatic Actuator)



Dimension

Effective Diaphragm Area cm ²	Force (kgf)					Stroke	Acuator Rod diameter	MX x DPX	Model
	1.2	1.5	1.8	2.1	2.4				
190	226	283	339	396	452	20	Φ16 x M14 x 1.5P	M8 x DP20	220
320	369	461	554	646	739	25	Φ16 x M14 x 1.5P	M8 x DP20	270
550	676	846	1015	1184	1353	30(40)	Φ25 x M20 x 1.5P	M8 x DP20	350
1,100	1154	1443	1731	2020	2309	50, 75	Φ30 x M24 x 1.5P	M8 x DP20	470

- Top Handle Body Material : C.Steel
- Top Handle Inner Part Material : SS Steel
- Top Handle Material : C.Steel
- Color : HJ BLUE

THE COMBINATION OF TRIM MATERIALS

• Valve Treatment for Standard Valve Body & Trim Materials

Part NO.	Part Name	Carbon Steel		Alloy Steel		Stainless Steel	
101,111	Body, bonnet	A216 Gr WCB	A352 Gr LCB	A217 Gr WC6	A217 Gr WC9	A351 CF8	A351 CF8
244 344 444	Plug	316L SS / CF8M	316L/CF8M	410SS/A217 CA15	410SS/A217 CA15	316L/CF8M	316L/CF8M
		316L SS+RTFE	316L+RTFE	316L+RTFE	316L+RTFE	316L+RTFE	316L+RTFE
		316L+STL#6	316L+STL#6	316L+STL#6	316L+STL#6	316L+STL#6	316L+STL#6
221 321 421	Seat Ring	316L SS / CF8M	316L/CF8M	410SS/A217 CA15	A410SS/A217 CA15	316L/CF8M	316L/CF8M
		316L SS + RTFE	316L+RTFE	316L+RTFE	316L+RTFE	316L+RTFE	316L+RTFE
		316L SS+STL#6	316L+STL#6	316L+STL#6	316L+STL#6	316L+STL#6	316L+STL#6
231	Stern	A276 Gr 316L	A276 Gr 316L	A479 Gr 410	A479 Gr 410	A276 Gr 316L	A276 Gr 316L
211	Cage	316L / CF8M	316L/CF8M	410SS/A217 CA15	410SS/A217 CA15	316L/CF8M	316L/CF8M
131	Bonnet Bolt	A193 Gr B7	A193 Gr B7	A193 Gr B7	A193 Gr B7	A320 Gr B8	A320 Gr B8M
132	Bonnet Nut	A194 Gr 2H	A194 Gr 2H	A194 Gr 2H	A194 Gr 2H	A194 Gr 8	A194 Gr B8
917	Packing Gland	304SS	304SS	304SS	304SS	304SS	304SS
910	Gland Flange	304SS	304SS	304SS	304SS	304SS	304SS
919	Gland Bolt	304SS	304SS	304SS	304SS	304SS	304SS
920	Gland Nut	304SS	304SS	304SS	304SS	304SS	304SS
30	Spring Pin	304SS	304SS	304SS	304SS	304SS	304SS
911	Packing	Graphite (Center Rings) + Carbon Fiber (Top & Bottom Rings), PTFE V-Ring					
32	Gasket	Graphite With S.S Spiral Wound Metal Ring					
D93	Name Plate	Requirement					

• Trim Part materials can be changed by the combination.

• Plug and Cage Material Combinations Option

Applications	Material		Temp Range (0°C)	
	Plug & Seat	Guide	min	max
General Option	316 St. St.	17-4 PH(316)	-40	400
	316 St. St.	440C St. St.	-49	400
Oil & Gas/Refinery	316 St. St.	17-4 PH(316)	-40	550
Oil & Gas NACE	316 St. St.	17-4 PH (NACE)	-79	287
Power & Utility	316 & Full Stellite	420 St. St.	400	550
	17-4 PH St. St.	420 St. St.	-40	400
H. temp Power/Utility	316 & Full Stellite	420 St. St.	400	550
High temperature Cryogenic NACE	316 St. St.	Stellite 6	-196	550
Cryogenic	316 & Full Stellite	316 St. St.	-196	550

• Cavitation, Quality and Durability of Metal

Material	Dead Time	Index	Hardness
Stellite #6(316SS+#6)	120	20	HB 400
17-4PH HRC45	12	2	HB 375
316SS	6	1	HB 187
Chrome Moly Steel (ASTM C5)	4	0.67	HB 200
Carbon Steel (ASTM WCB)	2.25	0.38	HB 150
Brass (ASTM B16)	0.5	0.08	HB 90

• Temperature Limits for Trim Materials

316 St. St.	-196	550
17-4 PH St. St.	-40	400
17-4 PH St. St. (NACE)	-79	287
420 St. St.	-29	550
440 St. St.	-29	400
Duplex St. St.	-50	370
Super Duplex St.St.	-50	370
Monel 400	-196	300
Monel K500	-196	300
Inconel 625	-196	593
Hastelloy B2	-196	538
Hastelloy C276	-196	538
660 Stainless Steel*	-196	600

• Plug Treatment for Non Standard Trim Materials

(or where the same plug and cage material is a mandatory customer requirement)

Plug Treatment	Max Inlet Pressure(barg)	Temp Range (0°C)	
		min	max
Base Material + Hard Chrome Plate	100	-40	250
Base Material + Full Stellite 6	400	-196	550

Note: families do not consider the hard chrome option.

BODY MATERIAL & OPERATING PRESSURE-TEMPERATURE RATING

• ANSI

(Unit : kg/cm²)

Material TEMP. (°C)	#150			#300			#600			#900			#1500		
	A216-WCB	A351-CF8	A351-CF8M	A216-WCB	A351-CF8	A351-CF8M	A216-WCB	A351-CF8	A351-CF8M	A216-WCB	A351-CF8	A351-CF8M	A216-WCB	A351-CF8	A351-CF8M
-5~38	20	19	19	52	51	51	104	101	101	156	152	152	260	253	253
93	18	16	17	48	42	44	96	84	87	143	127	131	239	211	218
149	16	14	15	46	38	39	92	76	79	138	114	118	230	189	197
204	14	13	14	45	35	36	89	70	72	134	105	108	223	175	181
260	12	12	12	43	33	34	85	65	67	127	98	101	212	164	168
316	10	10	10	40	31	32	80	62	63	120	93	95	200	155	159
343	9	9	9	39	30	31	77	61	62	116	91	93	193	152	155
371	8	8	8	37	30	31	75	59	61	112	89	92	187	148	153
399	7	7	7	36	29	30	71	58	60	107	87	90	178	145	150
427	6	6	6	29	28	30	58	57	59	87	85	89	144	143	148
454	5	5	5	22	28	30	45	56	59	67	84	88	112	139	147
482	4	4	4	16	27	29	32	55	58	49	82	88	81	137	146
510	2	2	2	9	27	27	19	54	54	29	81	82	48	134	136
538	1	1	1	6	25	26	12	50	51	18	75	77	30	124	128
566		1	1		23	11		46	51		69	76		115	127
593		1	1		18	21		36	43		54	64		90	107
621		1	1		14	17		29	33		43	50		72	83
649		1	1		12	13		23	26		35	39		58	65
677		1	1		9	10		19	21		28	31		47	52
704		1	1		8	8		16	17		24	25		40	41
732		1	1		7	7		13	13		20	20		33	34
760		1	1		5	5		11	11		16	16		27	27
788		1	1		4	4		8	8		12	12		20	20
816		1	1		3	3		6	6		9	9		14	14

• Cavitation, Quality and Durability of Metal

Material Group	Materials	Note
1.1	(a) (b) A105, A216-WCB (d), A350-LF2, GS-52	(a) It is available up to 427°C but not to used. (b) It is available up to 454°C but not to used. (c) It is available up to 593°C but not to used. (d) Max operating temperature < 343°C (f) Max operating temperature < 425°C (g) Max operating temperature < 455°C (h) Max operating temperature < 540°C (j) Max operating temperature < 593°C
1.5	(b) (h) A182-F1, A271-WC1 (d), A352-LC1	
1.9	(c) A182-F11, A182-F12 (j), A217-WC6	
1.13	A182-F5A, A217-C5, A181-F5	
2.1	A182-F304, A182-F304H, A351-CF8 (f), A351-CF3, 1.4408	
2.2	A182-F316, A182-F316H, A351-CF8M (g), A351-CF3M, 1.1308	

ALLOWABLE SEAT LEAKAGE & SHELL TEST PRESSURE

• Allowable Seat Leakage

- Series Number : ACV
- Series Name : Single Seated Type Globe Valve with Pneumatic Diaphragm Actuator
- Allow.Leakage : ANSI B 16.104 - 1976
- Test Fluid : Air (Test Pressure : 4kg/cm² G)
- Air Test : Bubble Tight Table

Port Size		Allowance Leakage(Air-Liter/min)				Allowance Leakage(Water-Liter/min)			
Inch	mm	II	III	IV	V	II	III	IV	V
1/2	12.7	36.500	7.300	0.730	0.073	0.855	0.171	0.017	0.002
3/4	19.1	54.750	10.950	1.095	0.110	1.282	0.256	0.026	0.003
1	25	85.167	17.033	1.703	0.170	1.994	0.399	0.040	0.004
1-1/4	32	152.083	30.417	3.042	0.304	3.561	0.712	0.071	0.007
1-1/2	40	200.750	40.150	4.015	0.402	4.701	0.940	0.094	0.009
2	50	304.167	60.833	6.083	0.608	7.123	1.425	0.142	0.014
2-1/2	65	517.083	103.417	10.342	1.034	12.108	2.422	0.242	0.024
3	80	669.167	133.833	13.383	1.338	15.670	3.134	0.313	0.031
4	100	1034.167	206.833	20.683	2.068	24.217	4.843	0.484	0.048
6	150	2555.000	511.000	51.100	5.110	59.829	11.966	1.197	0.120
8	200	4988.333	997.667	99.767	9.977	116.809	23.362	2.336	0.234

1. Table items calculate the ANSI II, III, IV, V

- 1.1. If the port doesn't provide a nominal outer diameter, operating test is performed by determining valve stroke based on valve size. Leakage is calculated using formula allows
 - 1.2. When testing, the gauge pressure (G) must be used.
 - 1.3. When the amount of leakage is calculated by formula, it must be calculated by absolute pressure (abs.).
 - 1.4. Marking IV is ANSI Class V provisions. Only for our product, standard of Maximum Seat Leakage is conducted by us.
2. Allowed leakage calculation ANSI Class V

$Q2 = 14.6 \times P1 \times \sqrt{G2} \times 1000/60 \times 0.0001$	Q2 = Volumetric Flow (Liter/min) G2 = Gas Weight (Air 1) P1 = Valve inlet Pressure (Absolute Pressure : abs.)
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• Class VI Maximum Allowable Seat Leakage (In accordance with ANSI/FCI 70-2)

Nomal Port Diameter		Bubbles Per Minute	
in	mm	ml per minute	Bubbles per minute
1	25	0.15	1
1-1/2	38	0.30	2
2	51	0.45	3
2-1/2	64	0.60	4
3	76	0.90	6
4	102	1.70	11

• Water Test Pressure Table

(Unit : Kgf/cm² (PSIG))

Body Material	150LB		300LB		Material
	Shell	Seat	Shell	Seat	
A216-WCB	32 (450)	22 (315)	79 (1125)	57 (815)	C-Steel casting
A352-LCB	28 (400)	21 (295)	74 (1050)	54 (765)	Ferritic Steel Casting
A352-LCC	32 (450)	22 (315)	79 (1125)	58 (825)	
A217-WC1	28 (400)	21 (295)	74 (1050)	54 (765)	Alloy Steel Casting
A217-WC6	32 (450)	22 (320)	79 (1125)	58 (825)	
A217-WC9					
A217-C5					
A217 C12					
A351 CF8	30 (425)	21 (305)	77 (1100)	56 (795)	Austenitic Steel Casting
A351 CF8M					
A351 CF3					
A351 CF3M					
A351 CN7M	25 (350)	18 (255)	63 (900)	46 (660)	
A351 CK20	28 (400)	20 (295)	72 (1025)	52 (740)	

APPLICABLE STANDARDS FOR CONTROL VALVE

• Control Valve Related Standards

1. CONTROL VALVE SELECTION FOR THE TERMS & CONDITIONS

ANSI B 16. 104-1976	American National Standard for Control valve seat Leakage FIC 70-2
IEC PUB 534-1	Industrial Process Valve Part 1 : General Considerations
JPI-7B-56-77	Instrumentation Design Data for Air System
PART 1 : PROCESS	Instrumentation and Control Section 6 : Control Valve and Port

2. SIZING

FCI 62-1	Recommend Volume Tray Standard Formulas for Sizing Control Valves
ANSI/ISA S75.01	Control Valve Sizing Equations
ISA	Hand Book of Control Valves, 2ND Edition

3. VALVE BODY

ANSI B16.34	Steel Valve
ISA	Hand Book of Control Valves, 2ND Edition

4. TRIM

JIS B 2003	General of Valve Inspection
ISA	Hand Book of Control Valves, 2ND Edition

5. MATERIAL

JPI-7S-15-81	Steel Flange for Petroleum Industry
ANSI B16.34	Steel Valve
JIS G 4303	Stainless Steel Bar
JIS G 5101	Carbon Steel, Cast Steel
JIS G 5121	Stainless Cast Steel
JIS G 5151	High Temperature High pressure Cast Steel
JIS G 5152	Low Temperature High pressure Cast Steel
JIS G 5501	Gray Cast Iron
JIS G 5502	Ductile Cast Iron
JIS B 8243	Structure of Pressure Vessel

6. NOISE

ISA SP 59.2	Field Measurements of Air Borne Sound Level Generated by Control valve
OSHA 1910 95	Occupational Noise Exposure, 1971
VDMA 24422	Control and Shut-Off Valves Guidelines for Computation

7. SECURITY

JIS 7S-39	Valve Inspection Regulations
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8. OTHERS

JPI-7B-60-79	Interlock & Emergency Shut-Down System Instrumentation Design Data
ASME ST' D NO. 112	Diaphragm Actuator Control Valve Terminology
JIS B 0100	Valve Terminology