INNOBIZ

ISO14001:2004 ISO9001:2000

GLOBE VALVE

Fundamental Of Engineering Data

Fundamental Of Engineering Data

AUTOMA

Automatic Valve & Accessories

CAGE GUIDE SINGLE SEATED TYPE GLOBE VALVE

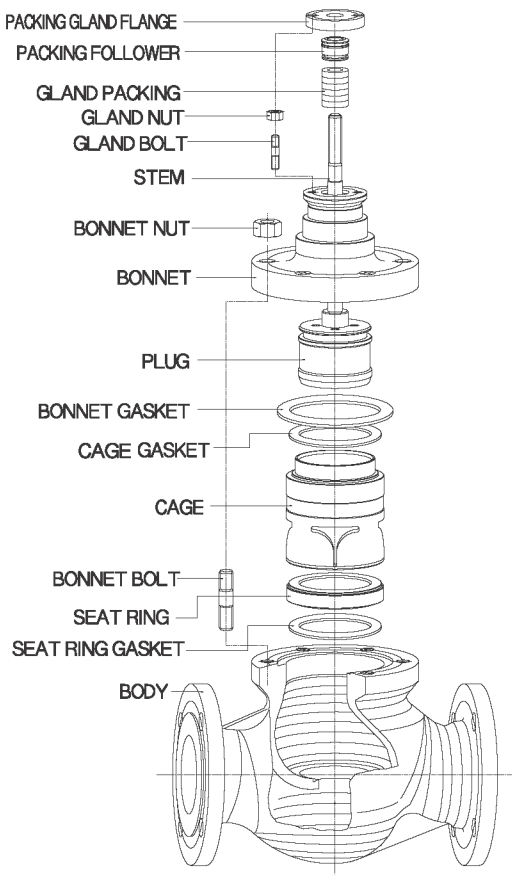
PRODUCT FEATURES (RELIABILITY)

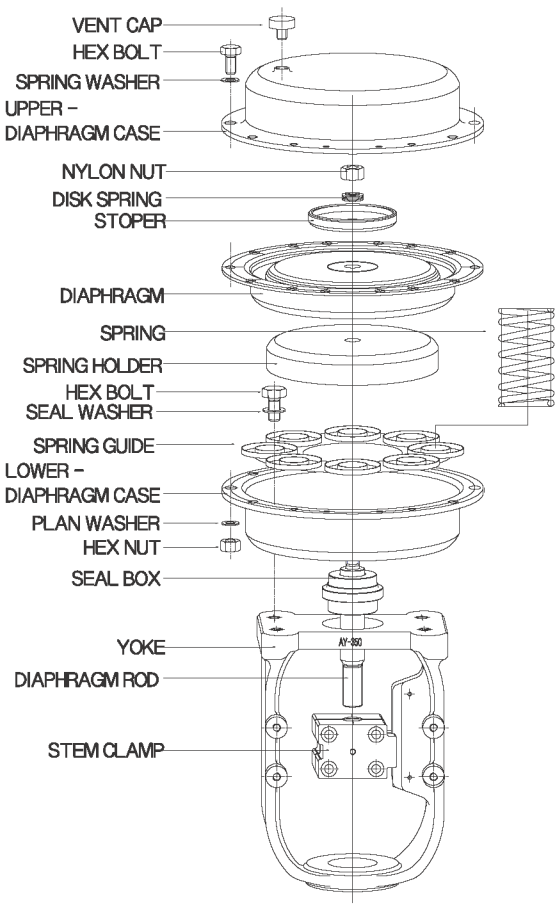
We do take into consideration all parts of the common use from product design.
And when the product is put into the field through complete inspection to produce rapid and complete mass product.
In particular, the seal line is total inspection by optical equipment.

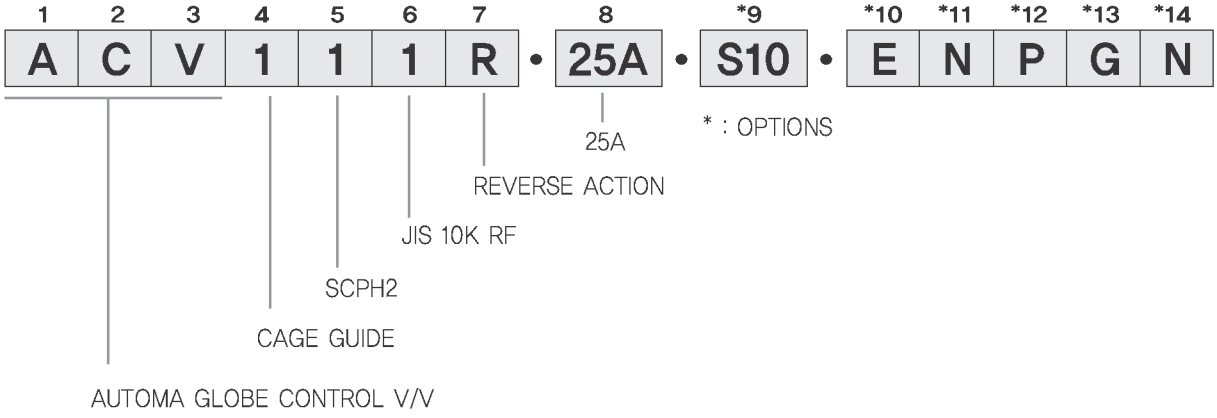
Body parts was designed to steam line for low pressure loss characteristics , and rangeability of 50: 1 was considerated to control the fluid flow as standard inside Trim part.

To able to assemble Extension bonnet, FIN bonnet, Bellowes bonnet, Jacket bonnet and etc is scalability of body part.
And end point of flange is JIS & ANSI standard.

The amount of fluid applies the standard type or ACV realizes accuracy required in the field by combination of body part, pneumatic diaphragm actuator, Positioner and Trim part ready-made to suit the needs of user specification.







1 2 3

A C V AUTOMA GLOBE CONTROL VALVE MODEL

4

1 VALVE TYPE
1 : CAGE GUIDE
2 : TOP GUIDE

5

1 VALVE MATERIAL
1 : KS D4107 SCPH2
(A216 WCB, DIN SC45)
2 : KS D4103 SCS13 (A351 CF8)
3 : KS D4103 SCS14 (A351 CF8M)
4 : KS D4103 SCS16 (A351 CF3M)

6

1 VALVE CONNECTION RATING
1 : KS(JIS) 10K RF
2 : KS(JIS) 20K RF
3 : ANSI #150 RF
4 : ANSI #300 RF
5 : PN 10 RF
6 : PN 16 RF

7

R ACTUATOR ACTION
R : REVERSE ACTION
D : DIRECT ACTION

8

25A VALVE SIZE
15A(1/2B)
20A(3/8B)
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)

*9

S10 CV TRIM NO
SEE FOR "ATS-4335-01"
TECHNICAL DETAILS
SPECIFICATIONS2

*10

E PLUG OPTION
E : EQ%
L : LINEAR
M : MODIFIED PARABOLIC

*11

N SEATING MATERIAL OPTION
N : METAL SEAT(316+316)
H : METAL SEAT(316*STL+316*STL)
S1 : SOFT SEAT(316+PTFE)
S2 : SOFT SEAT(316+PEEK)

*12

P BONNET OPTION
P : PLANE BONNET
B : BELLOWES BONNET
F : FIN BONNET
S : INSULATION FIN BONNET
E : EXTENTION BONNET

*13

G PACKING OPTION
G : GRAFOIL
(FILLER 6710+6610)
V : V-PACKING(PTFE)
P : PTFE PACKING

*14

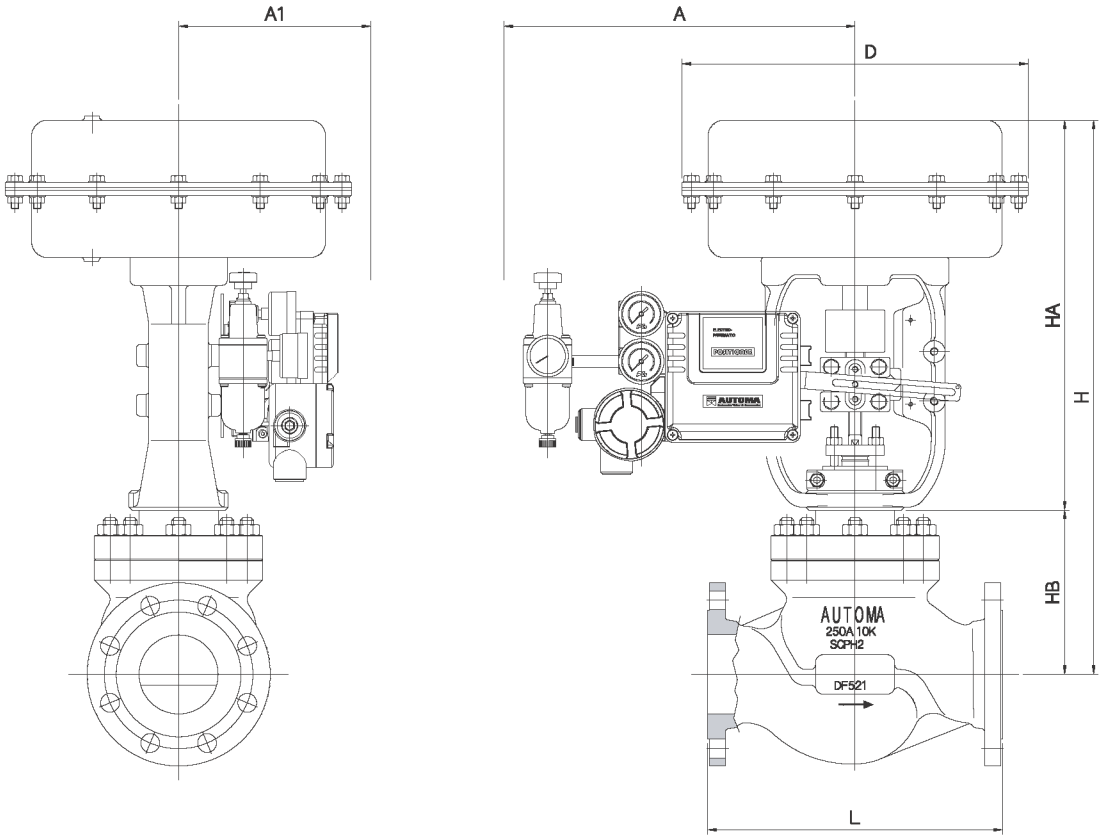
N HANDLE POSITION
N : NONE
L : LEFT
R : RIGHT
F : FRONT
B : BACK
T : TOP

STANDARD SPECIFICATION

Actuator Model No.			For See "Actuator (Pneumatic Diaphragm Linear) Dimensions Chart"										
Valve Type			Diaphragm or Cylinder Actuator operated globe control valve. MODEL : ACV										
Body	Valve Size	(mm)	15A	20A	25A	32A	40A	50A	65A	80A	100A	150A	200A	250A
		(inch)	1/2B	3/4B	1B	1 1/4B	1 1/2B	2B	2 1/2B	3B	4B	6B	8B	10B
	Stroke	mm	20	20	20	25	25	25	30	40	40	50	75	75
	Cv		For see "CV TABLE"											
	Pressure Rating		KS(JIS) 10K / ANSI 150LBF, KS(JIS) 20K / ANSI 300LBF											
	End Connections		RF, FF											
	Body Materials		For see "Body material & operating pressure-temperature rating."											
	Operating Temperature		Standard Type: -20°C ~ 210°C											
	Guide		Model : Cage Guide (Unbalance, Balance)											
	Gland Packing		V-PTFE, PTFE yarn, Graphite yarn											
	Gasket		SUS316 + Graphite spiral wound, Other alloy steels											
	Painting Color		Standard is silver. In the case of stainless steel, flange is not painted.											
	Plug Characteristics		Equal percentage, Linear											
	Trim Materials		SUS316, SUS316L+ (STL.), SUS410											
	Treatment of Trim		For see page "Valve body and bonnet parts, and the combination of trim materials Stem Motion & Trim treatment & material vs operating pressure-temperature ratings.											
Performance	Control Mode		For see page "Globe Valve Assembly dimensions"											
	Valve Action		Reverse action, Direct action											
	Rangeability		30:1, 50:1											
	Action Accuracy	Hysteresis	(Without positioner) max. 4% F.S., (With positioner) max. 1% F.S.											
		Linearity	(Without positioner) max. ±5% F.S., (With positioner) max. ±1% F.S.											
	Leakage		Allowable Seat Leakage											

CAGE GUIDE SINGLE SEATED TYPE
GLOBE VALVE ASSEMBLY DIMENSIONS

MODEL : ACV



Actuator Acting : Reverse, Direct
Operating Media : Compressed Dry Air
IN-PUT Signal : DC 4 ~ 20mA

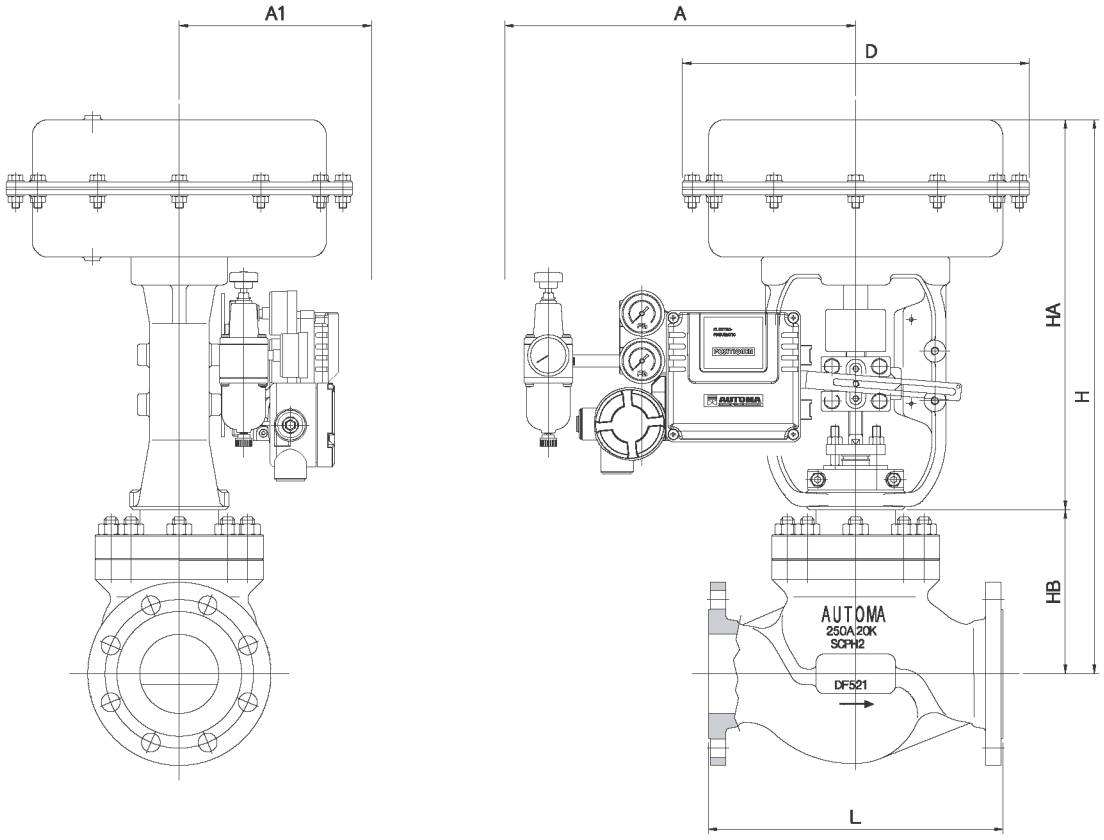
Fluid Temp : -20℃ ~ 210℃
End Connection : KS 10K(JIS 10K) ANSI 150LBF, DIN PN10
Accessories : E/P Positioner, Air Set

GLOBE VALVE ASSEMBLY DIMENSIONS

Size		Stroke	L	H	HA	HB	D	A	A1	Weight
15A	1/2″	20	184	377	276	100	220	250	140	
20A	3/4″	20	184	377	276	100	220	250	140	
25A	1″	20	184	382	276	106	220	250	140	
32A	1-1/4″	25	222	431	320	111	270	260	140	
40A	1-1/2″	25	222	431	320	111	270	260	140	
50A	2″	25	254	444	320	111	270	260	140	
65A	2-1/2″	30	276	529	394	155	350	270	190	
80A	3″	40	298	561	394	165	350	270	190	
100A	4″	40	352	581	394	185	350	270	190	
150A	6″	50	451	815	525	290	480	300	250	
200A	8″	75	543	875	585	350	480	300	250	
250A	10″	75	673	955	525	430	480	300	250	

CAGE GUIDE SINGLE SEATED TYPE
GLOBE VALVE ASSEMBLY DIMENSIONS

MODEL : **ACV**



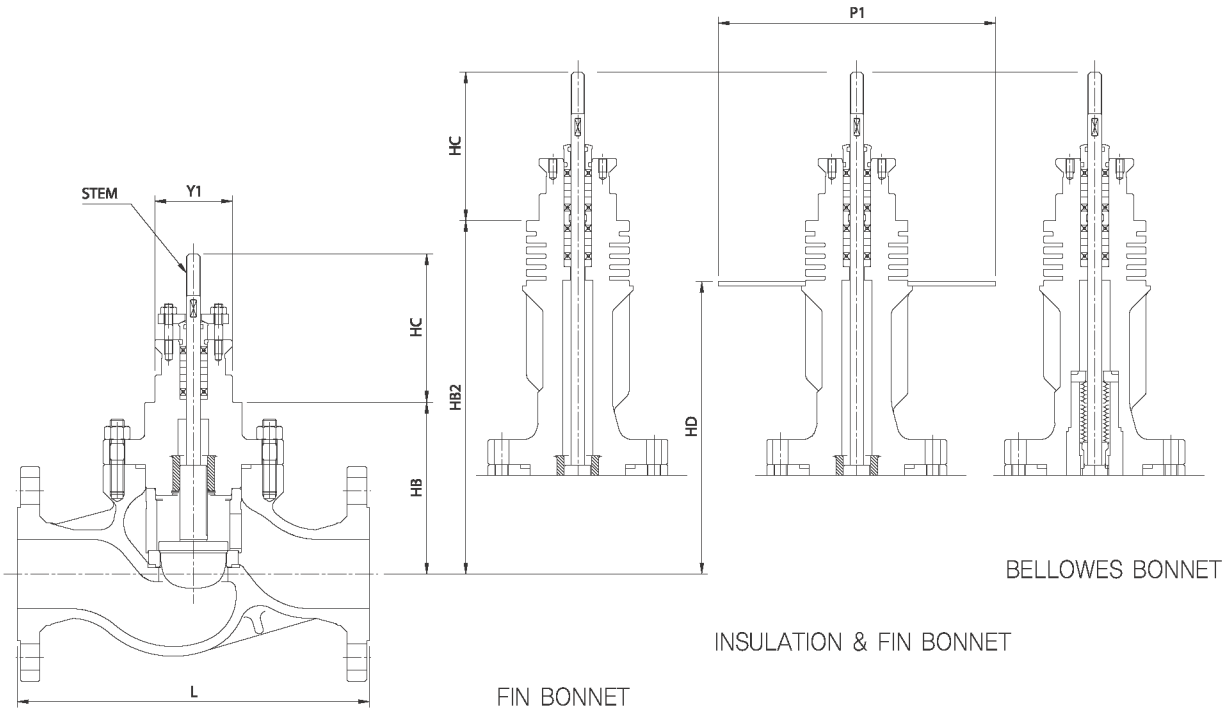
Actuator Acting : Reverse, Direct
Operating Media : Compressed Dry Air
IN-PUT Signal : DC 4 ~ 20mA

Fluid Temp : -20℃ ~ 210℃
End Connection : KS 20K(JIS 20K) ANSI 300LBF, DIN PN16
Accessories : E/P Positioner, Air Set

Globe Valve Assembly dimensions

SIZE		STROKE	L	H	HA	HB	D	A	A1	WEIGHT
15A	1/2″	20	194	377	276	100	220	250	140	
20A	3/4″	20	194	377	276	100	220	250	140	
25A	1″	20	197	382	276	106	220	250	140	
32A	1-1/4″	25	235	431	320	111	270	260	140	
40A	1-1/2″	25	235	431	320	111	270	260	140	
50A	2″	25	267	444	320	111	270	260	140	
65A	2-1/2″	30	292	529	394	155	350	270	190	
80A	3″	40	317	561	394	165	350	270	190	
100A	4″	40	368	581	394	185	350	270	190	
150A	6″	50	473	815	525	290	480	300	250	
200A	8″	75	568	875	525	350	480	300	250	
250A	10″	75	708	955	525	430	480	300	250	

GLOBE VALVE ACV MODEL IS BONNET TYPE
DIMENSIONS(KS/JIS 10K, ANSI 150LBF RF)



STANDARD PLANE BONNET

FIN BONNET

INSULATION & FIN BONNET

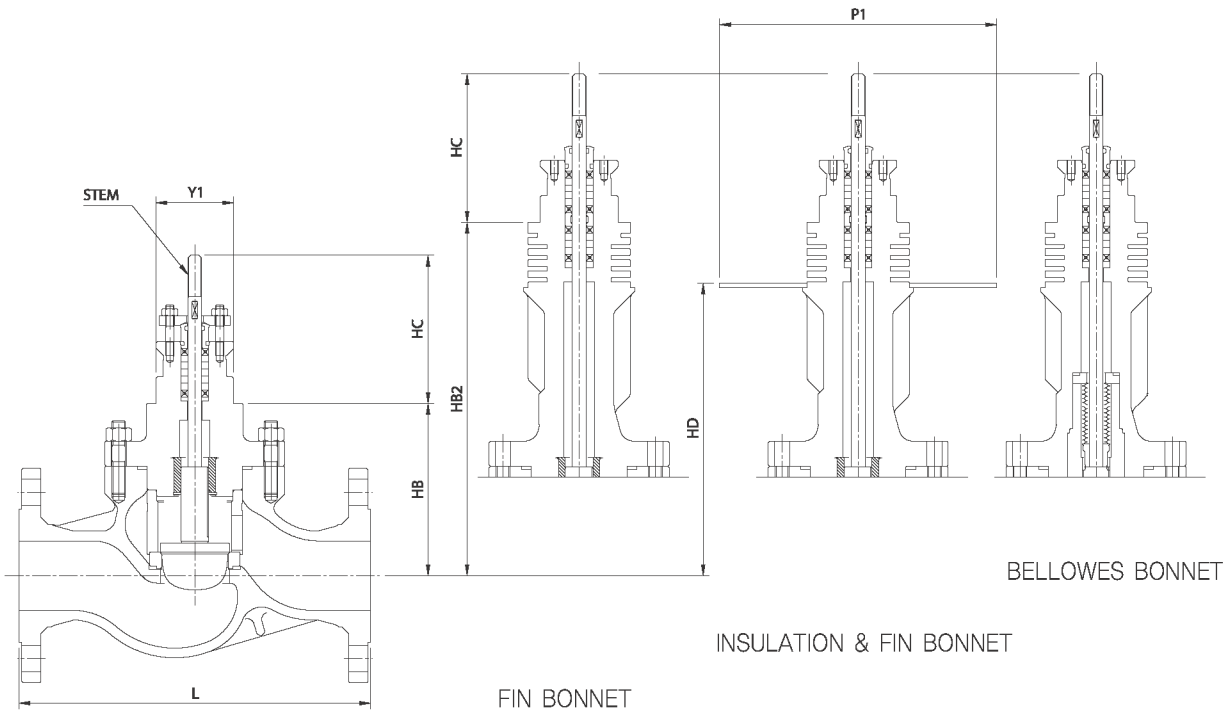
BELLOWES BONNET

GLOBE VALVE DIMENSIONS

mm

SIZE		STROKE	L	HB	HB2	Y1 $^{0}_{-0.1}$	HC	HD	P1	STEM
15A	1/2″	20	184	100	216	50	105	175	150	M10×1.5P
20A	3/4″	20	184	100	216	50	105	175	150	M10×1.5P
25A	1″	20	184	106	223	50	105	180	150	M10×1.5P
32A	1-1/4″	25	222	111	237	50	105	195	170	M10×1.5P
40A	1-1/2″	25	222	111	237	50	105	195	170	M10×1.5P
50A	2″	25	254	111	255	50	105	215	200	M10×1.5P
65A	2-1/2″	30	276	155	270	65.5	125	227	220	M14×1.5P
80A	3″	40	298	165	351	65.5	125	310	220	M14×1.5P
100A	4″	40	352	185	403	65.5	125	365	240	M14×1.5P
150A	6″	50	451	290	480	82	145	450	300	M16×1.5P
200A	8″	75	543	350	580	82	145	510	400	M18×1.5P
250A	10″	75	673	430	620	82	145	660	480	M18×1.5P

GLOBE VALVE ACV MODEL IS BONNET TYPE
DIMENSIONS(KS/JIS 20K, ANSI 300LBF RF)



STANDARD PLANE BONNET

FIN BONNET

INSULATION & FIN BONNET

BELLOWES BONNET

GLOBE VALVE DIMENSIONS

mm

SIZE		STROKE	L	HB	HB2	Y1 $_{-0.1}^{0}$	HC	HD	P1	STEM
15A	1/2″	20	194	100	216	50	105	175	150	M10×1.5P
20A	3/4″	20	194	100	216	50	105	175	150	M10×1.5P
25A	1″	20	197	106	223	50	105	180	150	M10×1.5P
32A	1-1/4″	25	235	111	237	50	105	195	170	M10×1.5P
40A	1-1/2″	25	235	111	237	50	105	195	170	M10×1.5P
50A	2″	25	267	111	255	50	105	215	200	M10×1.5P
65A	2-1/2″	30	292	155	270	65.5	125	227	220	M14×1.5P
80A	3″	40	317	165	351	65.5	125	310	220	M14×1.5P
100A	4″	40	368	185	403	65.5	125	365	240	M14×1.5P
150A	6″	50	473	290	480	82	145	450	300	M16×1.5P
200A	8″	75	568	350	580	82	145	510	400	M18×1.5P
250A	10″	75	708	430	620	82	145	660	480	M18×1.5P

GOLBE VALVE MICRO TRIM RATED CV (UNBALANCE TYPE, CAGE WINDOWS)
*EQ & LINEAR

VALVE SIZE	TRAVEL (mm)	PORT	TRIM NO.											
			0.001	0.004	0.01	0.03	0.11	S2.7	S3.3	S3.6	S4.1	S4.5	S5.3	S6.3
15A	20	SINGLE						0.20	0.25	0.30	0.4	0.5	0.7	1.0
20A	20	SINGLE						0.20	0.25	0.30	0.4	0.5	0.7	1.0
25A	20	SINGLE												
32A	25	SINGLE												
40A	25	SINGLE												
50A	25	SINGLE												
65A	30	SINGLE												

GOLBE VALVE FLOW COEFFICIENTS RATED CV CHART 1 (UNBALANCE TYPE, CAGE WINDOWS)
*EQ & LINEAR

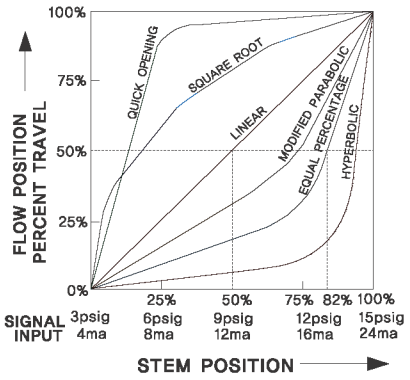
VALVE SIZE	TRAVEL (mm)	PORT	TRIM NO.												
			S7.5	S8.6	S10	S11	S11.5	S12.5	S14	S15	S20	S25	S32	S40	S50	S65
15A	20	SINGLE	1.5	2.0	2.7	3.0	3.6	4.0	5.0	6.0						
20A	20	SINGLE	1.5	2.0	2.7	3.0	3.6	4.0	5.0	6.0	9.0					
25A	20	SINGLE							5.0	6.0	9.0	14.0				
32A	25	SINGLE								6.0	9.0	14.0	25.0			
40A	25	SINGLE									9.0	14.0	25.0	33.0		
50A	25	SINGLE										14.0	25.0	33.0	50.0	
65A	30	SINGLE											25.0	33.0	50.0	85.0

GOLBE VALVE FLOW COEFFICIENTS RATED CV CHART 2 (BALANCE TYPE, CAGE P-PORT)
*EQ & LINEAR

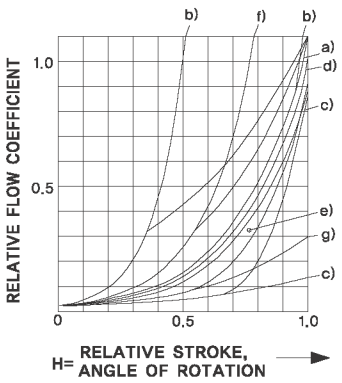
VALVE SIZE	TRAVEL (mm)	PORT	TRIM NO.											
			S50	S65	S80	S100	S125	S150	S200	S250	S300	S350	S400	S500
80A	40	4PORT			110									
100A	40	4PORT				178								
150A	50	5PORT						334						
200A	75	8PORT							660					
250A	75	8PORT								1000				

GLOBE VALVE CV CHART

INHERRENT FLOW CHARACTERISTICS FOR COMMON VALVE TRIM DESIGNS



CV FLOW COEFFICIENTS BY IEC S34-24-4



DIN/IEC 534-2-4

a) Tolerance zone of flow coefficients $\pm 10(\frac{1}{\varnothing})^{0.2}$ %

b) Max. slope tolerance 2b

c) Min. slope tolerance 0.5b

VDI/VDE 2173

e) Tolerance zone

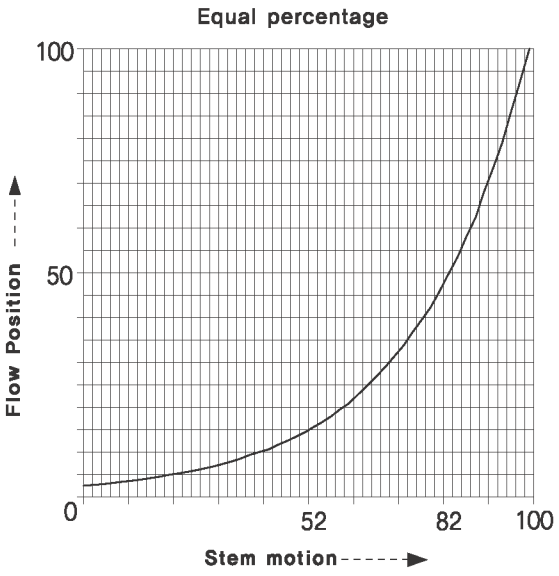
f) Max. slope tolerance 1.3b

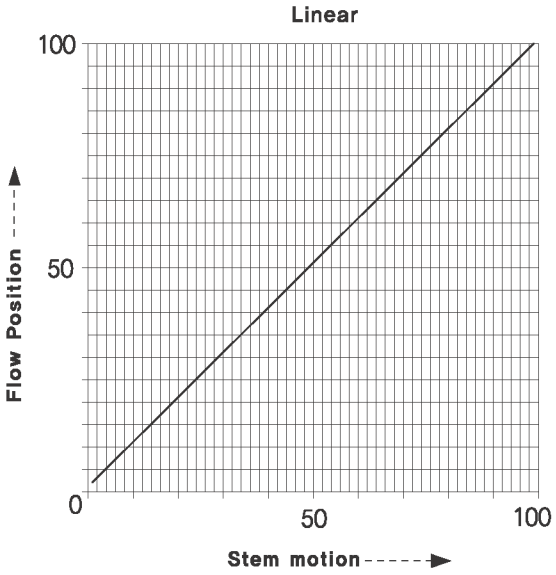
g) Min. slope tolerance 0.7b

b=tan $\alpha = \frac{\triangle \varnothing}{\triangle h}$

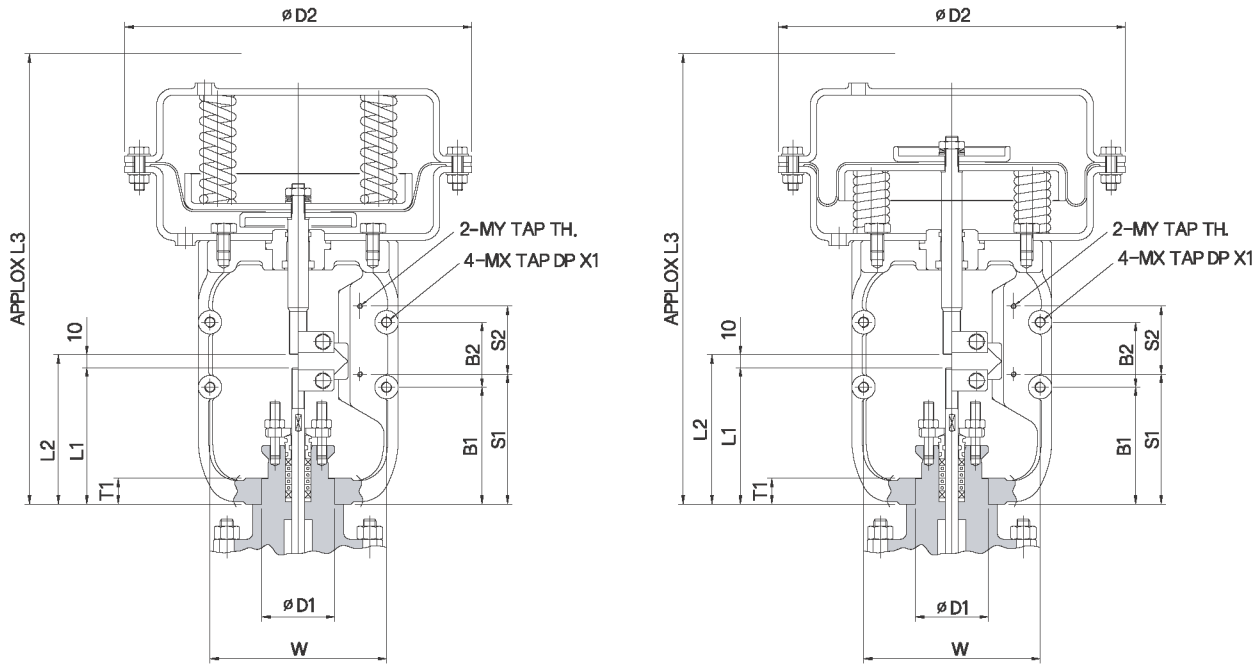
d) Ideal equal-percentage inherent flow characteristic

FLOW CHARACTERISTICS





ACTUATOR(PNEUMATIC DIAPHRAGM LINEAR)DIMENSION CHART



MODEL	FUNDAMENTAL OF ENGINEERING DATA(mm)										
	ø D1 +0.1~+0.3	ø D2	T1	L1	L2	L3	W	B1	B2	S1	S2
220	56	220	20	105	115	290	120	85	50	100	36
270	56	270	20	105	115	345	136	90	50	90.5	62
350	65.5	350	20	125	135	420	160	110	50	107	85
480	80	480	24	145	155	525	235	130	50	127	100

FUNDAMENTAL OF ENGINEERING DATA							
MODEL	EFFECTIVE DIAPHRAGM AREA Cm2	TORQUE		STROKE mm	Actuators Rod diameter	MY×TH	MX×DP×1
		DIRECT kgt	REVERSE kgf				
220	155	190	190	20	ø16×M14×1.5P	M4×0.7P	M8×DP20
270	198	320	320	25	ø16×M14×1.5P	M4×0.7P	M8×DP20
350	268	550	550	40(30)	ø25×M20×1.5P	M4×0.7P	M8×DP20
480	370	1100	1100	50,75	ø30×M24×1.5P	M4×0.7P	M8×DP20

Operating Spring Range : 1.0bar ~2.4bar / 0.8bar ~ 2.4bar
Supply Pressure : Reverse Act. 1.0bar ~3bar
Direct Act. 1.0bar ~3bar
Operating Speed : One Cycle(open to close) 3 to 15 sec
Signal Connection : PT 1/4
Ambient Temperature : -40℃ to +93℃

Main Part Material : Diaphragm / EPDM
Spring / SWOCS-V
Yoke / FCD45
Diaphragm Casing / C.Steel plate
DIAPHRAGM ROD / 304SS
Color HJ BULE

VALVE BODY AND BONNET PARTS, AND THE COMBINATION OF TRIM MATERIALS

PRAT No.	PART NAME	CARBON STEEL		ALLOY STEEL			STAINLESS STEEL	
		WCB	LCB	WC6	WC9	C5	CF 8	CF 8M
101,111	Body, Bonnet	A216 Gr WCB	A352 Gr LCB	A217 Gr WC6	A217 Gr WC9	A217 Gr C5	A351 CF8	A351 CF8M
244 344 444	Plug	316SS/CF8M	316SS/CF8M	410SS/A217 CA15	410SS/A217 CA15	410SS/A217 CA15	316SS/CF8M	316SS/CF8M
		316SS+RTFE	316SS+RTFE	316SS+RTFE	316SS+RTFE	316SS+RTFE	316SS+RTFE	316SS+RTFE
		316SS+STL#6	316SS+STL#6	316SS+STL#6	316SS+STL#6	316SS+STL#6	316SS+STL#6	316SS+STL#6
221 321 421	Seat Ring	316SS/CF8M	316SS/CF8M	410SS /A217 CA15	410SS /A217 CA15	410SS /A217 CA15	316SS /CF8M	316SS /CF8M
		316SS+RTFE	316SS+RTFE	316SS+RTFE	316SS+RTFE	316SS+RTFE	316SS+RTFE	316SS+RTFE
		316SS+STL#6	316SS+STL#6	316SS+STL#6	316SS+STL#6	316SS+STL#6	316SS+STL#6	316SS+STL#6
231	Stem	A276 Gr 316	A276 Gr 316	A479 Gr 410	A479 Gr 410	A479 Gr 410	A276 Gr 316	A276 Gr 316
211	Cage	316SS/CF8M	316SS/CF8M	410SS/A217 CA15	410SS/A217 CA15	410SS/A217 CA15	316SS/CF8M	316SS/CF8M
131	Bonnet Bolt	A193 Gr B7	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 2H	A194 Gr 8	A194 Gr B8
917	Packing Gland	304SS	304SS	304SS	304SS	304SS	304SS	304SS
910	Gland Flange	304SS	304SS	304SS	304SS	304SS	304SS	304SS
919	Gland Bolt	304SS	304SS	304SS	304SS	304SS	304SS	304SS
920	Gland Nut	304SS	304SS	304SS	304SS	304SS	304SS	304SS
30	Spring Pin	304SS	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 or Metal Ring						
D93	Name Plate	Requirement						

TRIM PART materials can be changed by the combination.

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

BODY MATERIAL & OPERATING PRESSURE-TEMPERATURE RATING

ANSI [Unit : MPa]

MATERIAL / TEMP. (℃)	150#			300#		
	A216-WCB	A351-CF8	A351-CF8M	A216-WCB	A351-CF8	A351-CF8M
-45~38		1.95	1.95		5.00	5.00
-5~38	2.01	1.95	1.95	5.15	5.00	5.00
50	1.97	1.85	1.89	5.15	5.00	5.00
100	1.81	1.61	1.66	4.68	4.13	4.26
150	1.62	1.44	1.52	4.56	3.67	3.90
200	1.45	1.30	1.42	4.43	3.32	3.61
250	1.25	1.21	1.25	4.21	3.09	3.39
300	1.06	1.06	1.06	3.92	2.96	3.20
350	0.89	0.89	0.89	3.74	2.86	3.08
375	0.78	0.78	0.78	3.69	2.82	3.01
400	0.69	0.69	0.69	3.49	2.79	2.96
425	0.60	0.60	0.60	2.93	2.76	2.92
450	0.52	0.52	0.52	2.04	2.73	2.86
475	0.42	0.42	0.42	1.40	2.70	2.78
500	0.33	0.33	0.33	0.93	2.65	2.72
525	0.23	0.23	0.23	0.56	2.24	2.62
538	0.18	0.29	0.20	0.36	2.23	2.58

JIS [Unit : MPa]

MATERIAL / TEMP. (℃)	SCPH2		
	10K	20K	30K
-5~120	1.42	3.38	5.04
~220	1.32	3.08	4.55
~300	1.03	2.89	4.26
~350		2.59	3.87
~400		2.30	3.38
~425		2.01	2.99
~450			
~475			
~490			
~500			
~510			

MAXIMUM OPERATING TEMPERATURE ACCORDING TO MATERIAL

MATERIAL GROUP	MATERIALS	NOTE
1.1	(a) (b) A105, A216-WCB (d) A350-LF2	(a) It is available up to 427℃ but not to used. (b) It is available up to 454℃ but not to used. (c) it is available up to 593℃ but not to used. (d) Max operating temperature 〈343℃ (f) Max operating temperature 〈425℃ (g) Max operating temperature 〈455℃ (h) Max operating temperature 〈540℃ (j) Max operating temperature 〈593℃
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	
2.2	A182-F316, A182-F316H, A351-CF8M (g) A351-CF3M	

"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	INSTRUMENTION DESIGN DATA FOR AIR SYSTEM
PART 1: PROCESS	INSTRUMENTATION AND CONTROL SECTION 6 : CONTROL VALVE AND POSRS

2. SIZING

FCI 62-1	RECOMMEND VOLUNTRAY 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	HANDBOOK OF CONTROL VALVES, 2ND EDITION

4. TRIM

JIS B 2003	GENERAL OF VALVE INSPECTION
ISA	HANDBOOK OF CONTROL VALVES, 2ND EDITION

5. MATERIAL

JPI-7S-15-81	STEEL FLANGE FOR PETROLEUM INDUSTRY
ANSI B16.34	STEEL VALVE
JIS G 4303	STANINLESS STEEL BAR
JIS G 5101	CARBON STEEL, CAST STEEL
JIS G 5121	STANINLESS 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 RP 59.2	FIELD MEASUREMENTS OF AIRBONE 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

8. OTHERS

JPI-7B-60-79	INTERLOCK & EMERGENCY SHUT-DONE SYSTEM INSTRUMENTATION DESIGN DATA
ASME ST'D NO. 112	DIAPHRAGM ACTUATOR CONTROL VALVE TERMINOLOGY
JIS B 0100	VALVE TERMINOLOGY

ALLOWABLE SEAT LEAKAGE

Series Number : ACV
Series Name : Cage Guide Single Seated Type Globe Valve Pneumatic Diaphragm Actuator
Allow.Leakage : Ansi B 16.104 - 1976
Test Fluid : Air (Test Pressure : 4 Kg/㎠ G)
Air Test : Bubble Titing 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 when Calculate the Ansi Class 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 the 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 ④ is ANSI Class V provisions. Only for our product, standard of Maximum Seat Leakage is conducted by us.
2. Allowed leakage calculation Ansi Clase V

$Q2 = 14.6 \times P1 \times \sqrt{Cv} \times G2 \times 1000/60 \times 0.0001$	Q2 = Volumetric Flow (litter/min) G2 = Gas Weight (Air 1) P1 = Valve Inlet Pressure (Absolute Pressure : abs.)

Class Ⅵ Maximum Seat leakage Allowable (In accordance with ANSI/FCI 70-2)

NOMINAL PORT DIAMETER		BUBBLES PER MINUTE	
in	mm	ml per minute	Bubbles per minute
1	25	0.15	1
1-1/2	38	0.3	2
2	51	0.45	3
2-1/2	64	0.6	4
3	76	0.9	6
4	102	1.7	11

WATER TEST PRESSURE TABLE Kgf/㎠ (PSIG)

BODY MATERIALA	150LB		300LB		MATERIAL
	SHELL	SEAT/B.SEAT	SHELL	SEAT/B.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 (320)	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)	

AUTOMA
Automatic Valve & Accessories

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※ The product is subject to change for technical development and quality improvement without prior notice.

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