Model 'GL' Series, Globe Control Valves

Valution`s Model GL Series is designed with a traditional Globe type flow path structure with a high 'pressure recovery coefficient(F_L factor)'.
Depending on the body structure, it is divided into single-seated unbalanced, cage balanced, double-seated, 3-way, and angle pattern.
Depending on the trim structure, there are un-balanced types with a built-in contoured plug trim, cage balanced types with a built-in cylindrical plug trim, multi hole type trims, and disk stack trims with grid-shaped labyrinth flow path.
This model can implement EQ-%, Linear and Modified-% flow characteristics with a contoured plug and a cage window shape.
Since the body has streamlined and S-shaped structures, it has low fluid resistance and sufficient space around the trim.
This model can apply the Spring-diaphragm, Cylinder, and Electric motor types of actuators.
The conventional E/P, Smart, and HART Positioners are applicable.

1. Numbering System

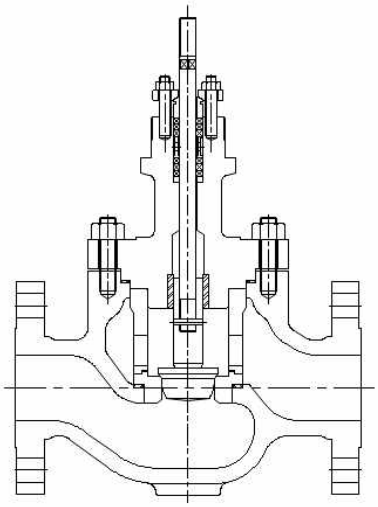
V10	-	GL	1	1	2	1

Actuator Type	Model	Body Type	Trim Type	Flow Characteristics	Plug Type
V10. Spring Diaphragm V20. Cylinder Double Acting V30. Spring Cylinder V90. Electric Motor V01. Other Type	GL	1. Single Seat Un-balanced 2. Single Seat Cage Balanced 3. 3-way 4. Angle Pattern 5. Double Seat 6. Lined Inside 9. Custom Pattern	0. Undefined 1. Un-balanced 2. Conven. Cage 3. Hani, 1-stage (Multi-hole) 4. Hani, 2-stage 7. Breeze Trim (Disk Stack) 9. Custom Trim	0. Undefined 1. Linear 2. Equal % 3. Modified % 4. Quick Open 9. Custom Char.	0. Undefined 1. Contoured 2. Cylindrical 3. Pilot 4. Cascade 5. Micro Cv 6. V-port 9. Custom

2. Features

1. Globe style with high F_L factor and flow paths with streamlined structure
2. Top entry structure that can be applied to Contoured, Cage-balance, Pilot, and Disk Stack trim in metal and soft seat
3. Various Rated Cvs and Customized Rated Cv can be applied to implement the desired opening plan of the customer according to the special specifications
4. In addition to basic EQ-%, Linear, and Quick Open flow characteristics, Customized Flow Characters can be applied to implement the desired flow characteristics of customers
5. Customized valve can be manufactured to improve specific weakness of existing same type valve
6. Applicable to the latest smart positioners as well as traditional P/P and E/P positioners with other instruments

3. Body Type (1/3)



< Fig. - 1 >

■ GL-1, GLOBE Single Seated, Un-balanced

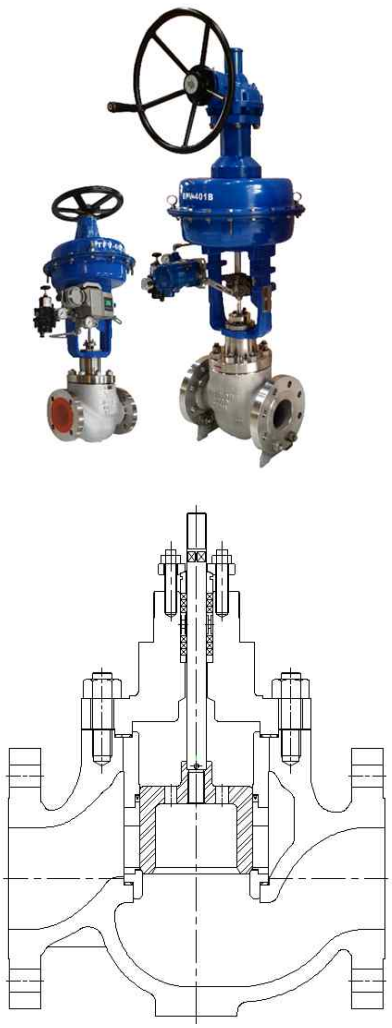
Valution`s single seated globe(GL-1) is a body structure with a 'S' shaped streamlined form, the fluid entering through one flow path is the globe valve which moves downstream through one path within the valve.

Depending on the fluid and pressure conditions in use, you can choose the 'Open Flow' or 'Closed Flow' fluid flow direction, but a 'Flow to open' structure is recommended for better control characteristics.

For this configuration, you can select a 'contoured plug trim' for large-capacity flow control, a 'micro Cv trim' for microflow control, and a 'cascade trim' for services that have large differential pressure or can generate cavitation.

The most frequently used form of the modulating control valve, the feature of which is top entry, the applicability of a wide range of rated Cv, the applicability of a flow-controlled trim, the maximization of the effects of low vibration, and the acquisition of high F_L coefficients.

According to the trim design, the valve type and trim design can be selected for applications such as low pressure, high pressure, high seat tightness conditions, low noise, high rangeability services, micro-flow control, etc.



< Fig. - 2 >

■ GL-2, GLOBE Single Seated, Cage Balanced

The cage type globe (GL-2), a single seat of the Valution, has an S-shaped streamlined structure, and the fluid flowing through one flow path moves downstream through one path in the valve. It is a globe valve that implements a pressure equilibrium structure through a cylindrical plug having an equilibrium structure with the cage.

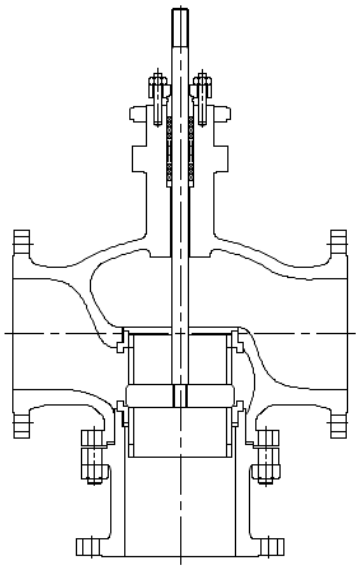
Depending on the fluid in use and the pressure conditions, the 'flow to open' or 'flow to close' fluid flow direction can be selected.

Generally, there are cage balanced types with built-in cylindrical plug trims, pilot types, multi-drilled hole trims, and disk stacks with grid-shaped labyrinth flow path.

The most frequently used form of the modulating control valve, the feature of which is top entry, the applicability of a wide range of rated Cv, the applicability of a flow-controlled trim, the maximization of the effects of low vibration, and the acquisition of high F_L coefficients.

According to the trim design, the valve type and trim design can be selected for applications such as low pressure, high pressure, high seat tightness conditions, low noise, high rangeability services, micro-flow control, etc.

3. Body Type (2/3)



< Fig. - 3 >

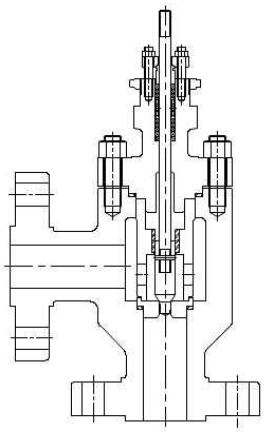
■ GL-3, 3-Way, Globe

The Globe 3-way structure is divided into a ‘mixing type’ in which the fluid enters from two flow paths and joins them into one flow path, and a ‘divert type' in which the fluid enters one flow path and is divided into two flow paths.

Each has a body structure of globe type with streamlined flow paths, and a seat ring of the thread type is standard, and a seat ring of the quick change type is also customizable.

This model can implement EQ-%, linear and modified-% flow characteristics in the shape of contoured plugs and cage windows. The body has a streamlined and S-shaped structure, which has low fluid resistance and sufficient space around the trim.

This model can apply the spring-diaphragm, cylinder, and electric motor types of actuators.
The conventional E/P, Smart, and HART Positioners are applicable.



< Fig. - 4 >

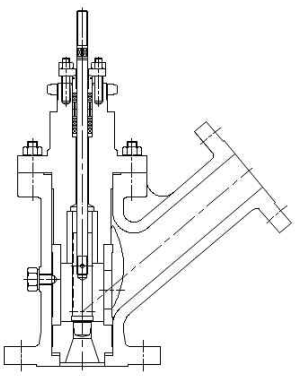
■ GL-4, Angle Pattern, Globe

Angle pattern structure is a globe valve in which fluid enters through a single flow path and flows downstream through a valve trim, with a body shaped like a 90-degree angle.
(Patterns at different angles are available, as shown in Fig.- 5 on the left.)

Depending on the fluid in use and the pressure conditions, the 'flow to open' or 'flow to close' fluid flow direction can be selected.
In particular, in the cavitation condition, the ‘flow to close’ direction has the advantage of minimizing damage to the body and pipe inner walls.

Generally, there are un-balanced types with built-in contoured plug trim, and cage balanced types with built-in cylindrical plug trims, pilot types, multi-drilled hole trims, and disk stacks with grid-shaped labyrinth flow path.

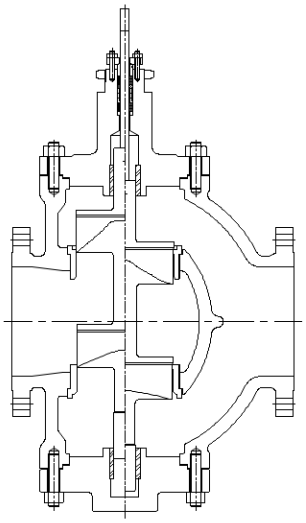
The most frequently used form of the modulating control valve, the feature of which is
top entry, the applicability of a wide range of rated Cv, the applicability of a flow-controlled trim, the maximization of the effects of low vibration, and the acquisition of high FL coefficients.



< Fig. - 5 >

According to the trim design, the valve type and trim design can be selected for applications such as low pressure, high pressure, high seat tightness conditions, low noise, high rangeability services, micro-flow control, etc.

3. Body Type (3/3)



< Fig. - 6 >

■ GL-5, Double Seated Globe

Valution`s double seated globe(GL-5) is a semi balance-type globe valve in which the fluid entering through one flow path is separated from the valve to the top and the bottom of the valve, and then moved downstream through one passage.

Guide the upper and lower parts with Bush and Boss of the Heavy duty type, or additionally, follow the guide of the Seat ring through the plug of the skirt type.

Valve Plugs can be manufactured into either a Counted or V-skirt type, depending on the fluid condition.

It is mainly used in service with BTX, Aromatic process and other slurry in refinery.

< Fig. - 7 >

■ GL-6, PFA or PTFE Lined Globe

Among Valution's unbalanced globe valves, it is a specialized control valve in which the internal fluid contact portion is lined with fluorine resin such as PFA or PTFE.

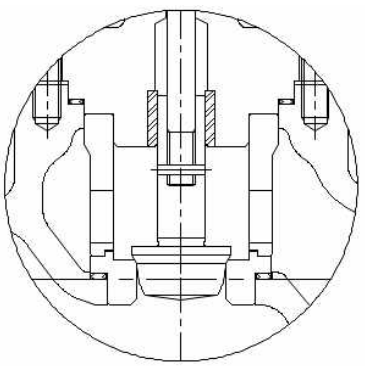
The single-seat globe (GL-6) is a streamlined 'S' body structure, and the fluid flowing through one flow path is a globe valve moving downstream through one path within the valve.

All parts in direct contact with the fluid are lined with fluororesin such as PTFE or PFA, and the housing is composed of carbon steel or stainless steel.

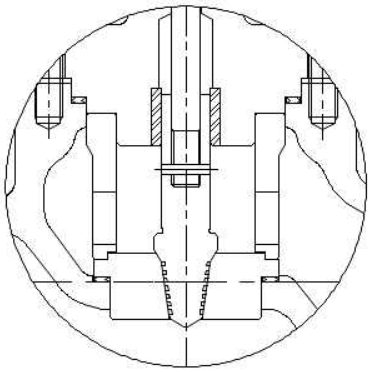
In this configuration, the trim of the valve takes the form of a 'contoured plug trim' or a v-skirt, and all fluid contact parts, such as the surface of the stem for valve stroking and bellows, consist of PTFE or PFA.

The used fluid is a highly corrosive fluid with strong acidity and is mainly used for low pressure of 10 barg or less.

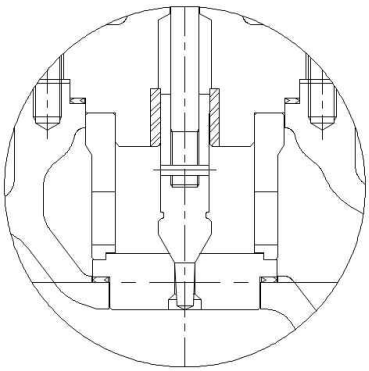
4. Trim Designs



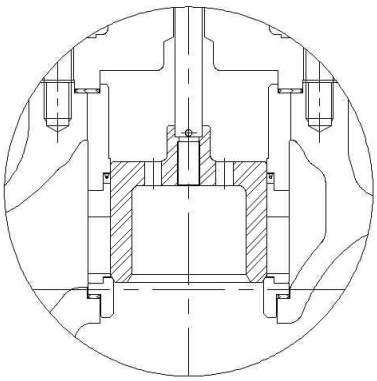
Contoured Trim



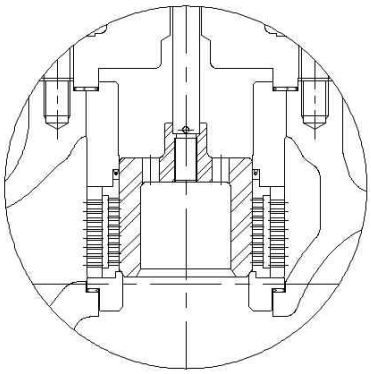
Cascade Trim



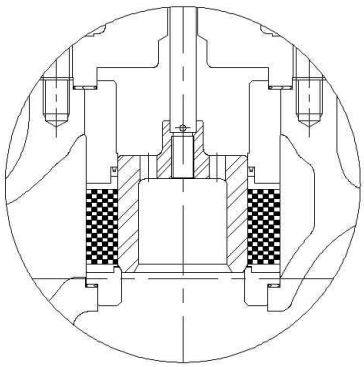
Micro Cv Trim



Cylindrical Cage Trim



Hani, 2-stage Trim



Breeze Trim

< Fig. - 7 > Various kinds of trim designs

5. Specifications (1/2)

■ General Specifications

Size Range	1" ~ 24" (other sizes are available)
Pressure Range	ASME 150#~4500#
Temperature Range	-196 ~ 592 ℃ according to the material spec.
Body Materials	A216 WCB, A217 WC6, WC9 A351 CF8, CF8M, CF3M A182 F51, F91, Inconel, Titanium & others
Trim Materials	316, 316L, 317L, 403, 410, 420(J2), 440, 630 Inconel, W-Co. overlay, Titanium & others
Trim Design	Un-balanced, Cage-balanced, Double-seated, Pilot-cage Disk-stack type and others
Trim Characteristics	E-Q%, Modified%, Linear, Quick-open, others
Cv Ratio	50 : 1(standard)
Seat Leakage Class	ANSI/FCI 70-2, Class IV, V, VI according to the spec.
Applicable Actuators	Pneumatic Diaphragm, Cylinder, Electric Motor, others
Applicable Instruments	P/P & E/P & Smart Positioners, SOV & other Relays
Options	Handwheel, Limit Stopper, Bellows Bonnet, Special NDT

■ Trim Material Combinations

Code No.	Trim Materials				Temp. Range(℃)
	Plug	Stem	Cage	Seat	
TR1	316 SS	316 SS	316 SS + HCr	316 SS	-196 ~ +425
TR2	316 SS + Cobalt	316 SS	316 SS + HCr	316 SS + Cobalt	-196 ~ +425
TR3	316 SS	316 SS	316 SS + HCr	316 SS + PTFE	-196 ~ +235
TR4	410 SS	630 SS	410 SS	410 SS	-29 ~ +425
TR5	420 J2	630 SS	420 J2	420 J2	-29 ~ +425
TR6	630 SS	630 SS	630 SS	316 SS	-29 ~ +425
TR7	Inconel 718	Inconel 718	F 91	F 91	-29 ~ +592
TR8	Inconel 718				-196 ~ +645

■ Seat Leakage Classifications (per ANSI FCI 70-2)

Code No.	Trim Style	Leakage Class
SL1	Metal to metal seat, Un-balanced	Class IV
SL2	Soft seal & metal seat, Balanced	Class IV
SL3	Metal(Hard graphite) seal & metal seat, Balanced	Class III
SL4	Double seat	Class II
SL5	Metal pilot seat	Class V
SL6	Metal plug & soft seat, Un-balanced	Class VI
SL7	Metal plug & soft seat, Balanced	Class V

***. Note**

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2. All data shown above are subject to change without notice.

5. Specifications (2/2)

■ Cage Balance Seal Applications

Code No.	Material & Style	Temp. Range(℃)
SR1	PTFE+Graphite, Pressure energized seal	-40~ +260
SR2	HPTFE+Graphite, Pressure energized seal	-40 ~ +300
SR3	PTFE, Pressure energized seal	-196 ~ +235
SR4	Metal seal	-196 ~ +592
SR5	Graphite seal	-196 ~ +592

■ Packing Applications

Code No.	Material & Style	Gasket Materials	Temp. Range(℃)
PK1	PTFE + Carbon fiber, Braided	#150 ~ #900	-196 ~ +260
PK2	PTFE V-Ring	#150 ~ #600	-196 ~ +235
PK3	Graphite(Braided + Mold)	#150 ~ #2500	-196 ~ +410
PK4	Hi-Graphite(Braided + Mold)	#150 ~ #2500	-196 ~ +592
PK5	GTFE V-Ring + SPC	#150 ~ #2500	-196 ~ +260

■ Bolt(Stud) & Nut Applications

Code No.	Body, Bonnet 5Materials	Bolt(Stud) / Nut Materials	Temp. Range(℃)
BN1	WCB, A105 Carbon steel	Stud : ASTM A193, B7 Nut : ASTM A194, 2H	-29 ~ +425
BN2	CF8,CF8M,CF3,CF3M Stainless steel	Stud : ASTM A193(320), B8(M) Nut : ASTM A194(320), 8(M)	-196 ~ +592
BN3	WC6,WC9,C12A,F91 Cr-Mo. steel	Stud : ASTM A193, B16 Nut : ASTM A194, 4	-29 ~ +592

■ Gaskets Applications

Code No.	Body, Bonnet Materials	Gasket Materials	Temp. Range(℃)
GS1	WCB, A105 Carbon steel	316 SS + Graphite S/W	-29 ~ +425
GS2	CF8,CF8M,CF3,CF3M Stainless steel	316 SS + Graphite S/W	-196 ~ +592
GS3		316 SS + PTFE S/W	-196 ~ +235
GS4	WC6,WC9,C12A,F91 Cr-Mo. steel	316 SS + Graphite S/W	-29 ~ +592

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6. Flow Coefficients - Rated Cv

■ Flow Coefficients - Rated Cv for Un-balanced Trim

Valve Size (inch)	Rated Travel (mm)	Rated Cv (Trim size)								
		1/4"	3/8"	1/2"	1"	1-1/2"	2"	3"	4"	6"
1/2	20	1.7	3.8	6.5						
3/4	20	1.7	3.8	6.5	12					
1	20	1.7	3.8	6.5	13					
1-1/2	20	1.7	3.8	6.5	13	28				
2	20		3.8	7.0	14	28	46			
3	40					31	48	110		
4	40						50	113	195	
6	50							126	204	380

■ Flow Coefficients - Rated Cv for Cage-balanced Trim

Valve Size (inch)				Rated Travel (mm)	Rated Cv						
					Standard Cage Trim				1-Stage Multi Hole Trim		
ASME Class					Linear		EQ%		Linear		
150 300	600	900 1500	2500		Full	Reduced	Full	Reduced	Standard	Reduced	(High Capacity)
1-1/2	1-1/2	2	2	20	28	13	26	12	20	10	
2	2	3	3	40	74	38	70	34	52	27	65
3	3	3	4	50	145	76	138	70	98	46	122
4	4	4	6	50	220	145	212	104	160	72	180
6	6	6	8	60	380	230	360	180	285	110	300
8	8	8	8	70	605	410	575	308	450	170	450
10	10	10	10	80	965	510	910	470	630	280	710
12	12	12	-	100	1280	760	1230	660	950	370	925
14	14	14	-	140	1750	1100	1660	900	1250	525	1260
16	16	16	-	160	2220	1460	2140	1220	1550	670	1660
18	18	-	-	180	3200	1700	3050	1550	1850	960	2250
20	20	-	-	200	4100	2050	3780	1890	2200	1100	2750
24	24	-	-	240	6200	3400	6040	3100	3200	1600	4100

■ Flow Coefficients - Rated Cv for Double Seat Trim

Valve Size (inch)	Rated Travel (mm)	Rated Cv	
ASME Class		Contoured Plug	V-Port Plug
150 ~ 600			
2"	20	48	48
3"	40	110	110
4"	40	195	195
6"	50	450	450
8"	65	750	750
10"	70	1160	1160
12"	90	1620	1620
14"	100		2000
16"	120		2560

■ Flow Coefficients - Rated Cv for 3-Way Trim

Valve Size (inch)	Rated Travel (mm)	Rated Cv
ASME Class		
150 ~ 600		
1"	20	9
2"	25	36
3"	40	75
4"	40	124
6"	50	270
8"	65	480
10"	70	750

***. Note**

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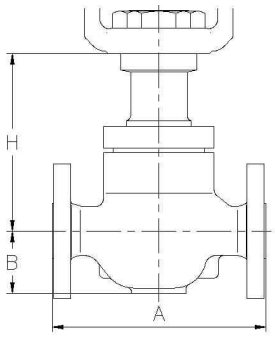
2. All data shown above are subject to change without notice.

7. Dimensions for GL Series

■ Dimensions for GL Series Control Valves (Class 150# ~ 600#)



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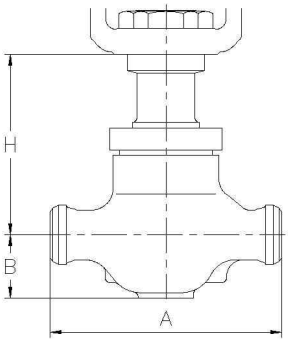
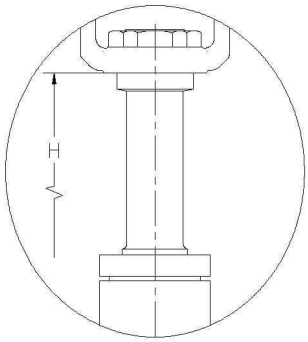


Threaded
Socket Weld / Butt Weld



Extension
Bonnet

ASME Class 150#, 300#, 600#

(unit : mm)

Valve Size (Inch)	A							B		H			
	Class 150~600	Class 150		Class 300		Class 600		Class 150~300	Class 600	Class 150~300		Class 600	
	Thr'd SW, BW	RF	RTJ	RF	RTJ	RF	RTJ			Standard Bonnet	Extension Bonnet	Standard Bonnet	Extension Bonnet
1/2	210	184	-	190	-	203	-	45	50	140	255	140	255
3/4	210	184	-	194	-	206	-	50	55	140	255	140	255
1	210	184	197	197	210	210	213	55	65	140	255	140	255
1-1/2	251	222	235	235	248	251	254	65	78	163	255	163	255
2	286	254	267	267	283	286	289	89	89	163	330	163	330
3	337	298	311	318	333	337	340	116	116	220	390	220	390
4	394	352	365	368	384	394	397	140	140	245	400	245	400
6	508	451	464	473	489	508	511	187	188	340	465	340	465
8	610	543	556	568	584	610	613	222	222	391	577	391	555
10	752	673	686	708	724	752	755	271	271	463	628	463	650
12	819	737	750	775	791	819	822	362	362	545	727	545	715
14	971	889	902	927	943	972	975	386	386	615	845	615	845
16	1098	1016	1029	1057	1073	1108	1111	440	440	690	905	690	905

***. Note**

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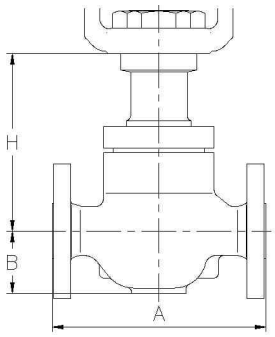
7. Dimensions for GL Series

■ Dimensions for GL Series Control Valves (Class 900# ~ 1500#)



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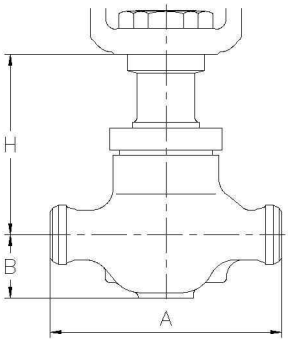
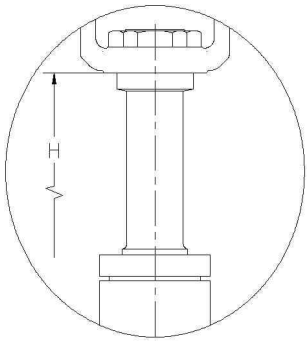


Socket Weld / Butt Weld



Extension Bonnet

ASME Class 900#, 1500#

(unit : mm)

Valve Size (Inch)	A						B	H	
	ANSI Class 900 SW,BW	ANSI Class 1500 SW,BW	ANSI Class 900		ANSI Class 1500		ANSI Class 900 ~ 1500	ANSI Class 900~1500	
			RF	RTJ	RF	RTJ		Standard Bonnet	Extension Bonnet
1/2	292	292	292	295	292	295	73	240	360
3/4	292	292	292	295	292	295	73	240	360
1	292	292	292	295	292	295	73	240	360
1-1/2	333	333	333	336	333	336	90	246	370
2	375	375	375	378	375	378	110	315	375
3	460	460	441	444	460	463	140	336	425
4	530	530	511	514	530	533	180	375	460
6	768	768	714	717	768	774	208	420	498
8	972	972	914	917	972	982	288	540	596
10	1168	1168	1092	1095	1168	1178	311	595	690
12	1218	1218	1130	1133	1218	1234	380	675	795
14	1362	1362	1257	1266	1362	1378	380	765	915
16	1508	1508	1390	1399	1508	1530	440	845	1045

***. Note**

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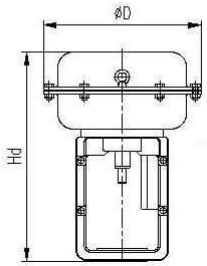
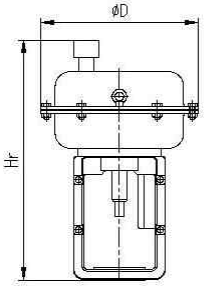
8. Actuators for GL Series

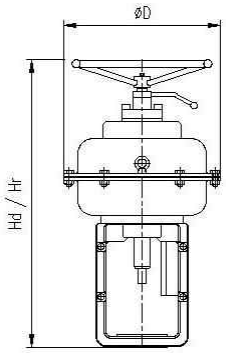
■ Model V10, Diaphragm Actuators



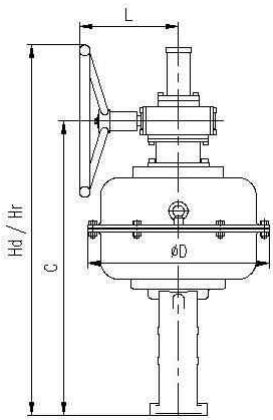
Direct Action



Reverse Action



Top Handwheel



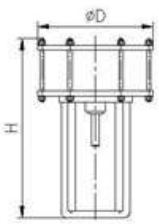
Top-Side Handwheel

Model V10

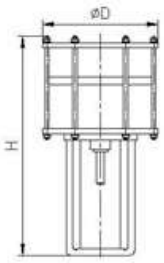
(unit : mm)

Actuator Size	D	Without Handwheel		With Handwheel				
		DA	RA	Handwheel Type	DA	RA	C	L
		Hd	Hr		Hd	Hr		
#2(25)	254	332	352	Top	450	473	-	-
#3(29)	294	369	419	Top	534	569	-	-
#4(37)	374	410	460	Top	575	620	-	-
#5(48)	484	629	679	Top side	979	979	779	260
#6(55)	554	678	728	Top side	1,098	1,098	848	300
#6H(55H)	554	728	778	Top side	1,148	1,148	848	300

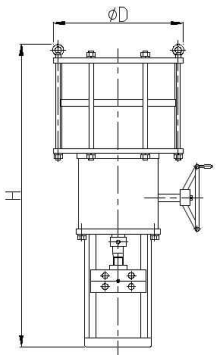
■ Model V20 & V30, Cylinder Actuators



Standard V20 & V30



Optional Volume Chamber



Optional V-Chamber & Handwheel

***. Note**

1. Please refer to Valution Actuator Model V10, V20, V30 product specification for more details.
2. All data shown in this product specification are currently standard specifications of Valution and can be customized by order specification.
3. All data shown above are subject to change without notice.

9. Weights & Instruments for GL Series

■ Weights

GL-1 & 2 Body Sub-Assembly

(unit : kgs)

Valve Size Inch(mm)	ANSI Class							
	150~300 Flanged	600 Flanged	900 Flanged	1500 Flanged	2500 Flanged	600 Welding	900~1500 Welding	2500 Welding
3/4~1(20, 25)	20	25	44	54	64	18	40	42
1-1/2(40)	27	30	56	68	78	25	53	55
2(50)	34	38	62	85	98	30	78	91
3(80)	64	68	140	158	182	58	128	169
4(100)	94	106	238	250	298	94	209	274
6(150)	194	215	512	528	614	202	387	465
8(200)	415	465	686	818	996	382	745	918
10(250)	542	620	1050	1260	1410	564	1146	1284
12(300)	940	980	1460	1720		910	1582	
14(350)	1280	1320	1860			1190	1710	
16(400)	1420	1490	2180			1360		

V-10 Actuator

(unit : kgs)

Actuator Size	Standard	With Handwheel	
		Top	Side
#2(25)	12	15	23
#3(29)	19	25	30
#4(37)	35	46	42
#5(48)	92	113	145
#6(55)	116	144	165
#6H(55H)	153	144	165

■ Applicable Instruments

- Positioners
: Smart, E/P, P/P Positioners for Single/Double Acting

- Instruments
: Transfer(Trip) Valves, Volume Booster Relay, Lock-up Valves, Check Valves
Air Regulators(Air Set), Speed Control Valves, Volume Tanks

- limit Switches & Stoppers

- Solenoid Valves

***. Note**

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2. All data shown above are subject to change without notice.

valution

*. Note

1. All data shown in this product specification are currently standard specifications of Valution and can be customized by order specification.
2. All data shown above are subject to change without notice.
3. The standard warranty period for all Valution products is one year after shipment, and we are not responsible for defects caused by arbitrary modification or customer error.

■ **Valution Inc.**

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