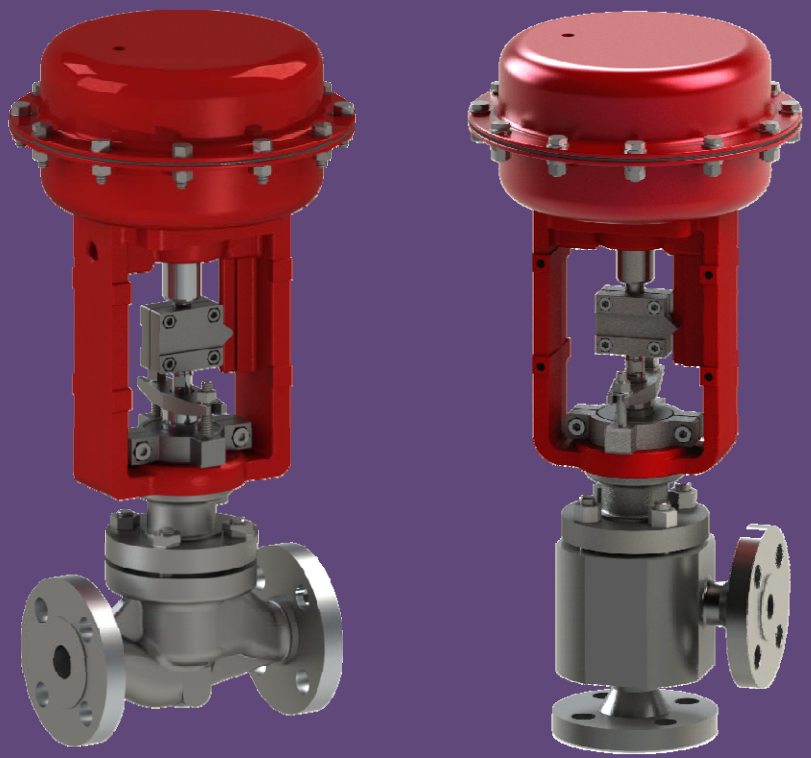
SG/SA-Series Control Valves

Single Ported Unbalanced Trim
Globe & Angle Body Pattern



Introduction / Features

The SG-SA-series is designed to provide cost effective, reliable and easily maintained control valves capable of working in harsh environments.

The quick change trim configuration provides for easily accessible seat and trim components to minimize fitting and parts replacement times.

The stem guided contoured trim gives excellent rigidity and resistance to vibration and wear.

The valves are designed to accommodate various trim types ; single contoured, multi-hole 1-stage, multi-hole 2-stage, multi-hole multi-stage and disk stack type X[iks]-trim.

Key Design Characteristics are

- Top & Cage Guided
- High Capacity with Low Recovery
- High Allowable Pressure Drop
- Tight Shutoff
- Wide Temperature range
- High Performance materials
- Simple, High performance trim package
- Anti-cavitation and Low Noise Capability
- Quick change Cage.

Contents

Model Numbering System

1	2	3	4	5
Body series	**Trim Design**	**Trim Type**	**Body Rating** (ANSI / KS)	**Actuator Type**
SG / Single Globe	G1 / Unbalanced	S1-Single Contoured	01-150 / 10K	DR-Diaphragm/Rever.
SA / Single Angle	G6 / Micro Flow	M1-Multi-hole 1-stage	02-300 / 20K	DD-Diaphragm/Direct
SF / All Teflon Body		M2-Multi-hole 2-stage	03-600 / 40K	CS-Spring Cylinder
		M3-Multi-hole 3-stage	04-900 / 62K	CD-Double Cylinder
		XT-X[iks]-trim	05-1500	EM-Electric Motor
		MS-Multi-step	06-2500	HS-Hydraulic Cylinder
			07-4500	MH-Manual Handle

Valve Specification

- Body Style
  ; High Capacity Globe, Angle & Y-Globe,
  ; All Teflon Body
- Body Size : 1/2" to 12" / Over 12"(option)
- Pressure Rating : ANSI 150 to 4500
  KS(JIS) 10K, 20K,40K, 62K
  DIN (Option)
- End Connections : FF, RF, RTJ, BW, SW, SCRD, Etc..
- Bonnet : Bolted type, Pressure Seal type.
  ; Standard type
  ; Extension type
  ; Bellows seal type.
  ; Long Extended type / Cryogenic Service
- Flow Direction
  ; Flow to open / Compressible Gas & Steam
  ; Flow to Close / Liquid, Water
- Trim Design : Unbalanced
- Trim Form
  ; Parabolic Contoured Plug
  ; Drilled Multi-Hole Velocity Control Cage
  ; X[iks]-trim (unbalanced)
  ; Micro Flow Plug
  ; Teflon Plug
- Characteristics : Linear, EQ-%, Modified-%. Q-Open.
- Rangeability : 30:1, 50:1, 100:1.
- Seat Leakage
  ; Standard -FCI 70-2. Class IV
  ; Option - FCI 70-2. Class V. VI.
  ; MSS-SP-61
- Materials of Body & Bonnet
  ; A216-WCB, A217-WC6, A217-WC9, A217-C12a, A105, A182-F11,F22, F91, F92, Inconel.
  ; A351-CF8,8M, CF3,3M, Monel, Duplex, Al-Bronze, Alloy Hastelloy, Titanium, Tantalum, All Teflon.
- Materials of Trim
  ; 316 SS, 410 SS, 416 SS, 420 SS, 420J2, 431 SS, 630 SS,
  ; 17-4PH, A182-F11/F22+Stellite overlay.
  ; Inconel, Others Special Materials

- Actuators
  ; Spring Diaphragm
  ; Double Cylinder
  ; Spring Cylinder
  ; Electric Motor
  ; Hydraulic Cylinder
  ; Self Contained Electro-Hydraulic Cylinder
  ; Gas-Over-Oil Hydraulic Cylinder

Inherent Flow Characteristics

The inherent flow characteristics of a control valve is the relationship between the flow and the valve travel at constant pressure drop. With cage trims, where a hole development controls the flow, the actual characteristic may vary slightly from the true curve.

Equal Percentage

Equal percentage is the characteristic, most commonly used in process control. The change in flow per unit of valve stroke is directly proportional to the flow occurring just before the change is made. While the flow characteristic of the valve may be equal percentage, most control loops produce an installed characteristic, which approaches linear when the overall system pressure drop is large relative to that across the valve.

Linear

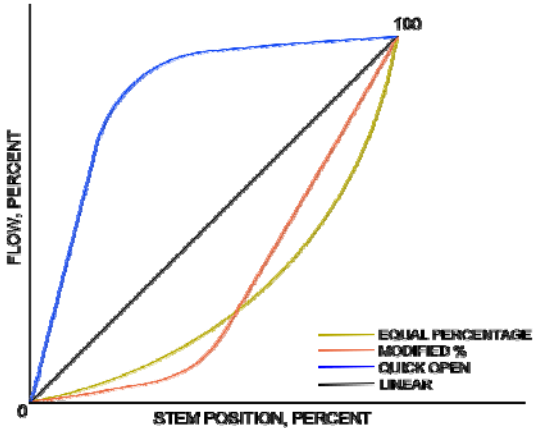
Linear inherent characteristic produces equal changes in flow per unit of valve stroke regardless of plug position. Linear plugs are used on those systems where the valve pressure drop is a major portion of the total system pressure drop.

Quick Open

Quick-open plugs are used for on-off service and are primarily designed to produce maximum flow quickly.

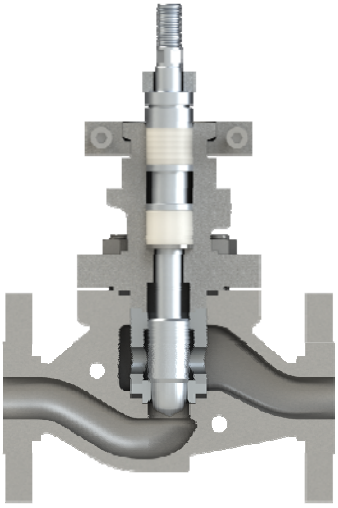
Modified-%

flow characteristic that lies somewhere between linear and equal percent. It provides fine throttling at low flow capacity and an approximately linear characteristic at higher flow capacity.



Cv Characteristic Curve

Feature of SG,SA-Series

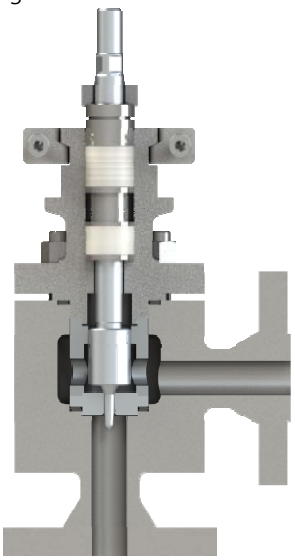


SG-series Body / Unbalanced Globe Body

SG-series single seated Top & Cage Guided Control valves are designed with built-in versatility that makes them well-suited to handle a wide variety of process applications.

SA-series angle valves incorporate the features of the BFS SG-series top-guided, single seat control valves in a solid cast, self-draining, top entry angle valve body. This rugged field-proven valve line has now been expanded to include four basic versions; standard, high pressure, standard quick change trim and venture seat-ring liners. The SA-series valves are particularly suitable for handling slurries and corrosive liquids.

The angle design provides flow surfaces that slope down-stream permitting the valve and line to self drain.

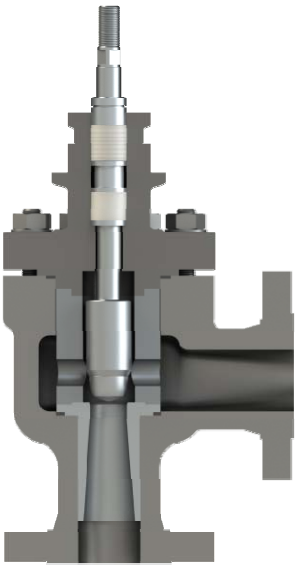


SA-series / Unbalanced Angle Body

The smoothly contoured surfaces minimize turbulence and prevent entrapment of particles which can cause valve clogging. In addition, the plugs are contoured top and bottom to reduce fluid traps.

The SA-series is also ideally suited for special applications such as hydrocarbon service involving severe operating conditions where high temperatures and/or high pressures, high pressure drops, severe coking conditions and flashing liquids may be encountered. They are particularly adopted to pressure or level control systems and emergency blow-down or dropout service. A special groups of high pressure SA-series are available and specifically designed for operating conditions involving especially high pressure and/or high pressure drop.

With the exception of the bodies, most parts of the SA-series, including trim, are interchangeable with parts of the same size and function in the SG-series solid cast globe valves. Accordingly, users having a need for both types of valves can keep parts inventories and related maintenance at a minimum.

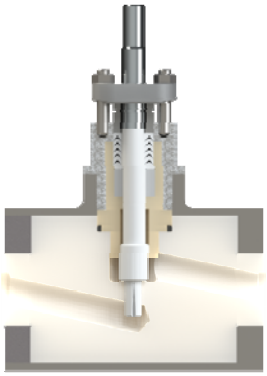


SA-series / Venturi Seat-Ring Liners

Venturi seat-ring liners are available in the standard SA-series in ANSI class 600 and lower and only on reduced area trim. These venturis, available in most of the same materials as the trim, provide a protective liner from the seat-ring to the valve outlet to resist erosion which may occur in certain types of service and operating conditions.

SF-series is designed for those applications where severe corrosion resistance is required. With its varied trim options and configurations, it is a most suitable valve for corrosive services.

- Teflon Bellows seal bonnet type Available.
- Stainless Steel Housing.



SF-series / All Teflon Single Seat Globe Body

Cryogenic Service

Reliability and ease of maintenance are essential features of any good control valve and to this end the BFS range of cryogenic service valves has been kept as simple as possible. The number of components has been kept to minimum and the access to the trim is straight forward through removing the bonnet retaining nuts and lifting the complete bonnet and plug assembly.

Bodies are normally supplied in stainless steel or bronze with a stainless steel extension of the suitable length for the installation position and temperature as low as minus 268℃. The extension can be fitted with a cold-box flange of any shape and size required. Trim construction is based on the traditional BFS top & retainer guided quick change seat design and incorporates a soft seal in PTFE or RTFE when bubble tight shut-off is required.

Cryogenic Service Bonnet Application

Other types of trim such as balanced cage are available when required. End connection can be flanged, screwed, socket or butt-weld end plus pipe stabs as necessary. All body components are cleaned and degreased suitable for oxygen service and the end connection suitably masked after testing to prevent ingress of foreign materials and moisture.

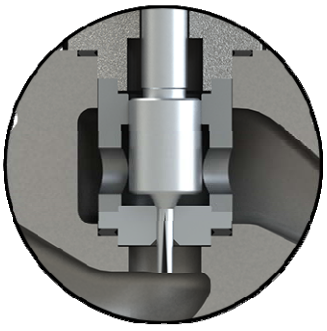
Steam or Hot oil Jacketed Globe Body

The jacketed SG/SA-series valve uses a standard globe style with oversized, blind flanges for a full jacket or standard flanges for a partial jacket. The jacket is rated for 150psig (10.3barg) and is equipped with a 3/4" NPT supply and drain connection

SG-series Steam Jacketed (Option)

Micro-Flow Control Valves

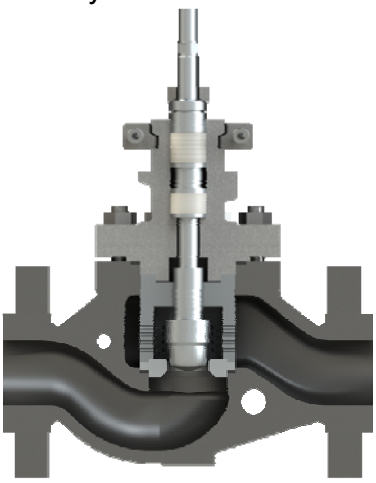
are designed and manufactured to control low flow rates with 1" and smaller line size. These products are widely used for applications in laboratories, pilot plants, technical research facilities and catalyst control as well as industrial processes requiring high degrees of low flow control accuracy.



Micro-Flow Control Valve

MH1S/MH2S/MHMS

Drilled Hole Velocity Control Trim



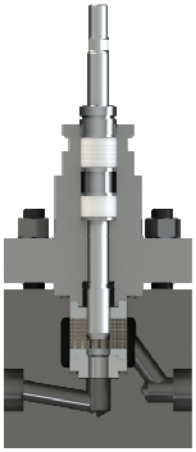
SG-series / Multi-Hole 1-Stage Application

On the basis of SG-series, drilled hole velocity control trims were developed by BFS to minimize noise level and vibration through trim particularly for compressive steam and gas of high differential pressure. The plug is unbalanced, single seated type, and the cage is drilled hole type cage for pressure reduction. These valves are suitable for superheated steam over 100Mpa differential pressure, saturated steam between 5 and 10Mpa and compressive fluid of high differential pressure.

X[iks]-trim

Disk Stack type Labyrinth Trim

The BFS X[iks]-trim control valve effectively attenuates gaseous and hydrodynamic noise, and eliminates the damaging effects of cavitation. X[iks]-trim features a series of labyrinth stacked discs; each of which has labyrinth passage machined on the face. Flow passes from the center of the disc stack across the face of the disc, causing a series of expansions and contractions of the flow.



SG-series / X[iks]-trim Application

The combined effect of numerous narrow flow channels, each with many turns and continually expanding flow path, removes kinetic energy from the fluid while gradually lowering its pressure. In doing so, abrupt velocity increases that are the source of noise are avoided.

The additional benefit for liquid flow is the elimination of cavitation and its damage it can do to a valve, its trim and the downstream piping.

Packing and Guiding

Packing Box

Standard BFS packing boxes are deeper than most conventional types, providing the following advantages:

1 2 3 4 5

1. Teflon V-Packing *2. Molded Graphite Packing*
3. Teflon Low Emission V-Packing
4. Double Teflon V-Packing (Vacuum & Pressure service)
5. Molded Double Graphite Packing

1. The spacing between the wiper set and the main upper packing set prevents contamination of the upper packing. The upper set is positioned far enough away from the wiper set to avoid contact with any part of the plug stem that has been exposed to the following medium. The wiper set is designed to minimize the amount of fluid on the plug stem.

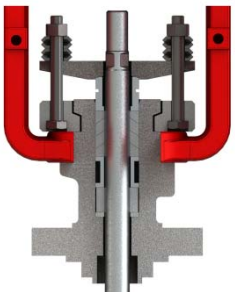
2. Bonnets are designed to permit a wide variety of packing configurations, including a double set of packing, without changing bonnets.

3. Two widely spaced stem guides, when used with the SG/SA-series large plug stem diameter, provide exceptional guiding. The upper stem guide also acts as a packing follower; the lower guide is situated close to the plug head for additional guiding support, ensuring accurate alignment of plug and seat ring.

4. Solid hard graphite guides provide superior guiding over wide temperature ranges and completely eliminate guide/stem galling. A variety of guides are available for various applications, including solid brass, Glass-filled PTFE.

Live Loading Packing / High Temperature Protection

Belleville springs are used when the valve itself is subjected to temperature sufficiently high to expand the stem. This stem expansion, when restrained, can damage the seat or plug, bend the stem or damage the actuator thrust bearings. Belleville springs allow the drive sleeve to move with the thermal expansion and relieve the linear force. Belleville washers are also used in valve packing to provide a constant load. Shows Belleville springs for constant packing load. They feature a high spring constant and compactness thus enabling a constant packing load. The also shows that the necessary spring rate is achieved by stacking washers in series or parallel.



Live Loading Packing System

Bonnet Types

Extension Bonnet

The extended bonnet protects the packing from excessive heat or cold, which may inhibit valve performance. The bonnet is constructed of carbon steel for temperatures from -30℃ to 427℃ and Stainless Steel for -100℃ to 816℃.

Extension Bonnet

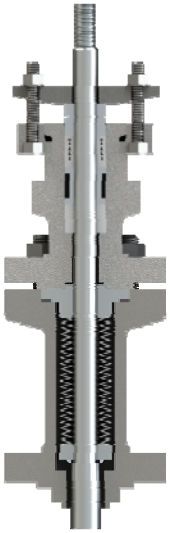
Cold Box Extension Bonnet for Cryogenic Service

The cold box extended bonnet permits stagnated, moderate temperature gas to form in the bonnet, which protects the packing from the service fluid. Typically manufactured from 304SS or 316 SS, it handles temperatures down to -253℃. Standard construction consists of stainless steel bonnet flange and bolting.

Cold Box Extension Bonnet

Metal Bellows Seal Bonnet

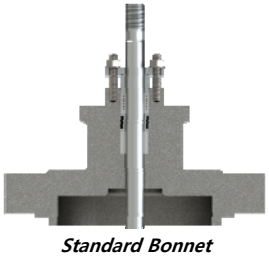
Provides for a positive metallic gland seal within the rated pressure and temperature of the bellows material selected. Uses on hazardous, lethal service as a backup seal in the unlikely event of bellows failure. The standard welded metal bellows seal is rated for operation in processes ranging in temperature -196℃ to 593℃ and pressure to 76barG. / ANSI Class 1500#-Option. (meet zero emissions)



Bellows Seal Bonnet

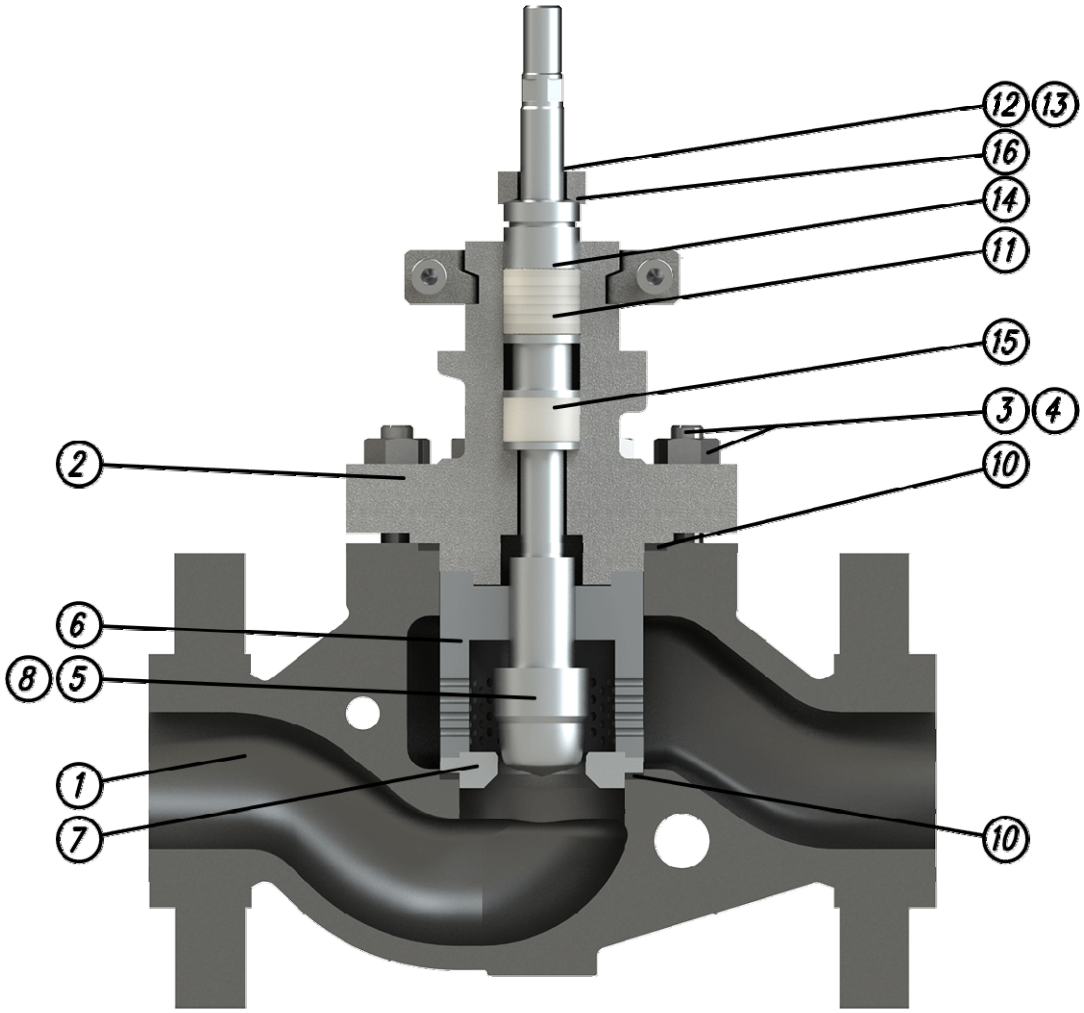
Standard Bonnet

The Globe & Angle Valves bonnet is usually constructed of the same material as the body with steel yoke and handles temperatures from -30℃ to 400℃

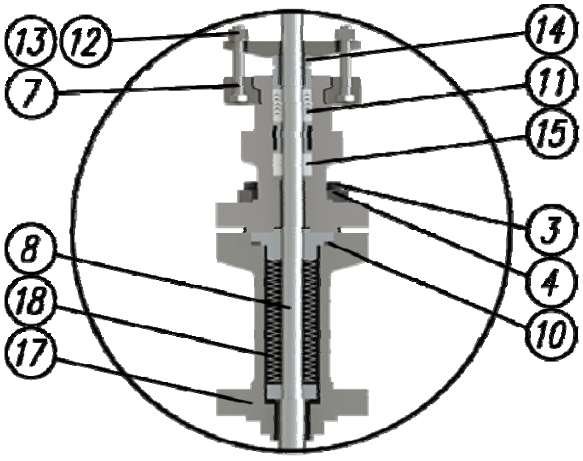


Standard Bonnet

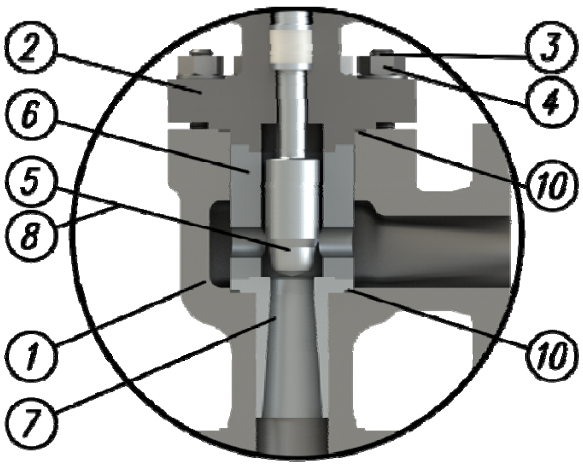
Body Assembly Construction



SG-Series / Single Seat Unbalanced Quick Change Trim Globe Body.



Bellows Seal Bonnet



SA-Series / Angle Venturi Liner Body

Material Application of SG/SA-series

Fluid Temperature / ℃		-196	-45	-29	+425	+450	+480	+566
Ref. No	**Parts Name**	**Standard Materials**						
1	Body			A216-WCB / A105				
				A217-WC6,WC9, C12a / A182-F11, F22, F91, F92				
		A351-CF8 / A351-CF8M / 304 SS, 316 SS,						
2	Bonnet			A216-WCB / A105				
				A217-WC6,WC9, C12a / A182-F11, F22, F91, F92				
		A351-CF8 / A351-CF8M / 304 SS, 316 SS,						
3	Body Studs			SNB7				SNB16
				Alloy Steel ASTM A193 Gr. B7				
		304 SS						
4	Body Stud Nuts			S45 C				ASTM A194 Gr. 4
				Alloy Steel ASTM A194 Gr. 2H				
		304 SS						
5	Plug	316 SS						
				410 SS				A182-F11 + Stellited
6	Cage / Guide	316 SS or 316 SS + Stellited						
				410 SS				A182-F11 + Stellited / Inconel
7	Seat Ring	316 SS or 316 SS + Stellited						
				410 SS				A182-F11 + Stellited
8	Plug Stem	316 SS / Inconel						
9	Guide Bushing			440C SS / ASTM A276 TY 440C				
		Standard with Stainless Steel Body Materials / Stellited.						
10	Body Gasket	304 Stainless Steel with Grafoil Filler / Spiral Wound						
11	Packing	Braided Teflone or V-Teflone.						
				Molded Graphite				
12	Packing Studs	304 SS						
13	Packing Studs Nuts	304 SS						
14	Packing Follower	304 SS						
15	Packing Spacer	316 SS						
16	Packing Flange	A351-CF8 or 304 SS						

* Body Materials Application : A216-WCB, A217-WC6, A217-WC9, A217-C12a, A105, A182-F11, A182-F22, A182-F91, A182-F92, A351-CF8, A351-CF8M, A351-CF3, A351-CF3M, Monel, Hastelloy-C/B, Duplex, Titanium, Inconel, Al-Bronze, Aluminium, Others.

* Trim Materials Application : 304 SS, 316 SS, 316 SS+Stellited, 410 SS, 416 SS, 420 SS, 630 SS (17-4PH) , A182-F11/22/F91 + Stellited, Inconel, Hastelloy, Titanium, Duplex, Monel, Others.

* Code and Standard for materials application : KS. ANSI. ASTM. JIS. DIN. Etc.

Cv Characteristic Chart

Micro Flow Plug Trim Applicatrion / Linear

Percent of Plug Travel (%)			Min	Intermediate Cv					Max.
Valve Size	Trim No.	Treavel	*Rated Cv*						
FL		(mm)	0.85 to 0.92						
Note 1.	M9	10	0.0016	0.002	0.0024	0.0028	0.0032	0.0036	0.004
	M8	10	0.004	0.005	0.006	0.007	0.008	0.009	0.01
	M7	10	0.01	0.013	0.016	0.019	0.021	0.023	0.025
	M6	10	0.02	0.025	0.03	0.035	0.04	0.045	0.05
	M5	10	0.04	0.05	0.06	0.07	0.08	0.09	0.1
	M4	10	0.1	0.13	0.16	0.19	0.21	0.23	0.25
	M3	10	0.25	0.3	0.35	0.4	0.45	0.5	0.55
	M2	10	0.5	0.6	0.7	0.8	0.9	1	1.1
	M1	10	0.9	1.1	1.3	1.5	1.7	1.9	2.1

1. Application Valve Body Size : 1/4", 3/8", 1/2", 3/4", 1", 1-1/2".

2. Over 1-1/2" Cv Characteristic : Please contact BFS Sales Rep.

Cv Characteristic Chart

Micro Flow Plug with Anti-Cavitation Trim Application / Linear

Percent of Plug Travel (%)			Min	Intermediate Cv					Max.
Valve Size	Trim No.	Treavel	*Rated Cv*						
FL		(mm)	0.85 to 0.92						
Note 1.	C6	10	0.02	0.025	0.03	0.035	0.04	0.045	0.05
	C5	10	0.04	0.05	0.06	0.07	0.08	0.09	0.1
	C4	10	0.1	0.13	0.16	0.19	0.21	0.23	0.25
	C3	10	0.25	0.3	0.35	0.4	0.45	0.5	0.55

1. Application Valve Body Size : 1/4", 3/8", 1/2", 3/4", 1", 1-1/2".

2. Over 1-1/2" size : Please contact BFS Sales Rep.

Cv Characteristic Chart

Ultra Micro Flow Plug Trim Applicatrion / Linear

Description		Treavel	Rated	Rangeability		Orifice	Port
Valve Size	Trim No.	(mm)	Cv	Linear	EQ-%	Diameter / m3	Area / m3
Note 1.	U9	10	0.000036		N/A	0.042	0.0014
	U8	10	0.00005		N/A	0.0625	0.0014
	U7	10	0.00008		N/A	0.0625	0.0031
	U6	10	0.00012		N/A	0.0625	0.0031
	U5	10	0.00018		N/A	0.0625	0.0031
	U4	10	0.00027		N/A	0.0625	0.0031
	U3	10	0.004		N/A	0.0625	0.0031
	U2	10	0.006		N/A	0.0625	0.0031
	U1	10	0.001		N/A	0.0625	0.0031

1. Application Valve Body Size : 1/4", 3/8", 1/2", 3/4", 1", 1-1/2".

2. Over 1-1/2" size : Please contact BFS Sales Rep.

3. Electric Etching Machined for Plug

Cv Characteristic Chart

Parabolic Contoured Plug / Linear ***Linear***

Percent of Plug Travel (%)			10	20	30	40	50	60	70	80	90	100
Valve Size	Seat Dia.	Treavel	*Rated Cv*									
FL		(mm)	0.93	0.93	0.92	0.92	0.91	0.91	0.91	0.90	0.90	0.90
3/4", 1"	0.156"	10	0.026	0.045	0.065	0.084	0.103	0.123	0.142	0.161	0.181	0.2
	0.250"	20	0.104	0.181	0.259	0.336	0.413	0.491	0.568	0.645	0.723	0.8
	0.375"		0.455	0.793	1.132	1.47	1.808	2.147	2.485	2.823	3.162	3.5
	0.500"		0.65	1.133	1.617	2.1	2.583	3.067	3.55	4.033	4.517	5
	0.750"		1.17	2.04	2.91	3.78	4.65	5.52	6.39	7.26	8.13	9
1"(25A)	1.000"	20	2.08	3.627	5.173	6.72	8.267	9.813	11.36	12.167	14.453	16
1-1/2"(40A)	1.000"	20/30	3.25	5.667	8.083	10.5	12.917	15.333	17.75	20.167	22.583	25
	1.580"		4.55	7.933	11.317	14.7	18.083	21.467	24.85	28.233	31.617	35
2"(50A)	1.580"	30	4.94	8.61	12.29	15.96	19.63	23.31	26.98	30.65	34.33	38
	2.000"		6.11	10.65	15.2	19.74	24.28	28.83	33.37	37.91	42.46	47
2-1/2"(65A)	2.000"	30/40	6.5	11.33	16.17	21	25.83	30.67	35.5	40.33	45.17	50
	2.500"		9.49	16.55	23.6	30.66	37.72	44.77	51.83	58.89	65.94	73
3"(80A)	2.000"	30/40	7.15	12.47	17.78	23.1	28.42	33.73	38.05	44.37	49.68	55
	3.000"		13.65	23.8	33.95	44.1	54.25	64.4	74.55	84.7	94.85	105
4"(100A)	3.150"	40/50	14.3	24.93	35.57	46.2	56.83	67.47	78.1	88.73	99.37	110
	4.000"		24.7	43.07	61.43	79.8	98.17	116.53	134.9	153.27	171.63	190
6"(150A)	4.000"	40/50	26	45.33	64.67	84	103.33	122.67	142	161.33	180.67	200
	6.000"	50/70	40	98.67	129.33	168	206.67	245.33	284	322.67	361.33	400

**** Over 6" Cv Characteristic : Please contact to BFS Sales Rep.***

Cv Characteristic Chart

Parabolic Contoured Plug / Equal Percentage ***Equal Percentage***

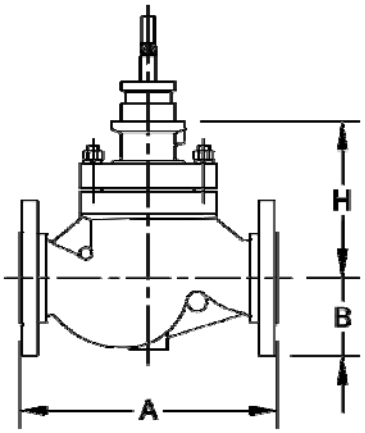
Percent of Plug Travel (%)			10	20	30	40	50	60	70	80	90	100
Valve Size	Seat Dia.	Treavel	*Rated Cv*									
FL		(mm)	0.93	0.93	0.92	0.92	0.91	0.91	0.91	0.90	0.90	0.90
3/4", 1"	0.25	20	0.015	0.2	0.028	0.039	0.055	0.077	0.108	0.152	0.214	0.3
			0.038	0.053	0.074	0.104	0.146	0.205	0.288	0.405	0.569	0.8
	0.375"		0.164	0.23	0.324	0.455	0.639	0.898	1.262	1.773	2.491	3.5
	0.500"		0.234	0.329	0.462	0.65	0.913	1.283	1.802	2.533	3.558	5
	0.750"		0.422	0.592	0.832	1.169	1.643	2.309	3.244	4.559	6.405	9
1"(25A)	1.000"	20	0.749	1.503	1.48	2.079	2.921	4.105	5.767	8.104	11.387	16
1-1/2"(40A)	1.000"	20/30	1.171	1.645	2.312	3.248	4.564	6.413	9.012	12.662	17.792	25
	1.580"		1.64	2.3	3.24	4.55	6.39	8.98	12.62	17.75	24.91	35
2"(50A)	1.580"	30	1.78	2.5	3.51	4.94	6.94	9.75	13.7	19.25	27.4	38
	2.000"		2.2	3.09	4.35	6.11	8.58	12.06	16.94	23.81	33.45	47
2-1/2"(65A)	2.000"	30/40	2.34	3.29	4.62	6.5	9.13	12.83	18.02	25.32	35.58	50
	2.500"		3.28	4.61	6.47	9.09	12.78	17.96	25.23	35.45	49.82	70
3"(80A)	2.000"	30/40	3.33	4.67	8.56	9.23	12.96	18.21	25.95	35.96	50.53	71
	3.000"		4.92	6.91	9.71	13.64	19.17	26.94	37.85	53.18	74.73	105
4"(100A)	3.150"	40/50	5.15	7.24	10.17	14.29	20.08	28.22	39.65	55.71	78.28	110
	4.000"		8.9	12.5	17.57	24.69	34.69	48.74	68.49	96.23	135.22	190
6"(150A)	4.000"	40/50	9.18	12.9	18.12	25.48	35.78	50.28	70.65	99.27	139.49	196
	6.000"	50/70	18.73	26.32	36.99	51.97	70.59	102.62	144.19	202.6	284.67	400

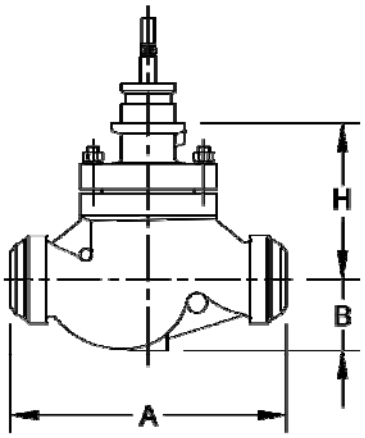
**** Over 6" Cv Characteristic : Please contact to BFS Sales Rep.***

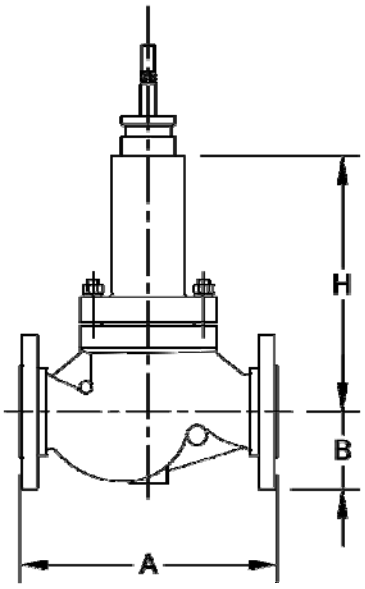
Body Dimension
SG-series
Single Ported Unbalanced Globe Body Valves

unit/mm

Valve Size	ANSI Class	A			B	H	
		RF Flange	RTJ Flange	Welding		Standard	Extension
15A(0.5")	150	184	-	206	50	150	260
	300	190	-	206	50	150	260
	600	203	-	206	50	155	270
20A(0.75")	150	184	206	210	50	155	270
	300	194	206	210	50	155	270
	600	206	206	210	50	170	296
	900	273	273	279	60	230	350
	1500	273	273	279	60	230	350
	2500	318	308	318	70	280	410
25A(1")	150	184	197	210	55	155	270
	300	197	210	210	55	155	270
	600	210	210	210	55	170	296
	900	273	292	279	70	230	350
	1500	273	292	279	70	230	350
	2500	318	318	318	80	280	410
40A(1.5")	150	222	235	251	63	145	245
	300	235	248	251	78	145	245
	600	251	251	251	78	145	245
	900	333	333	330	80	187	287
	1500	333	333	330	80	187	287
	2500	381	384	359	103	250	350
50A(2")	150	254	267	286	75	156	256
	300	267	283	286	83	156	256
	600	286	289	286	83	156	256
	900	375	378	375	108	248	348
	1500	375	378	375	108	248	348
	2500	400	403	400	118	279	379
65A(2.5")	150	276	289	311	90	195	295
	300	292	308	311	95	195	295
	600	311	314	311	95	195	295
	900	410	413	375	123	248	348
	1500	410	413	375	123	248	348
	2500	441	447	400	133	279	379
80A(3")	150	298	311	337	95	204	304
	300	318	334	337	105	204	304
	600	337	340	337	105	210	310
	900	441	444	460	120	280	380
	1500	460	463	460	133	280	380
	2500	660	666	498	153	345	445
100A(4")	150	352	365	394	115	235	335
	300	368	384	394	128	235	335
	600	394	397	394	138	243	343
	900	511	514	530	145	339	439
	1500	530	533	530	155	339	439
	2500	737	747	575	178	399	499
150A(6")	150	451	464	508	140	320	420
	300	473	489	508	160	320	420
	600	508	511	508	178	328	429
	900	714	717	768	190	425	570
	1500	768	774	768	198	425	570
	2500	864	877	819	243	500	620
200A(8")	150	543	556	610	173	383	510
	300	568	584	610	190	383	510
	600	610	613	610	210	388	515
250A(10")	900	914	917	832	235	425	675
	1500	972	982	832	243	425	675
	2500	1022	1038	1029	275	620	740







1. Standard Process Connection of Welded type : under 2" SW. Over 2" BW application.

2. Flanged End Face-to-Face dimensions are per ISA-75.08.01-2002 and 78.08.06-2002

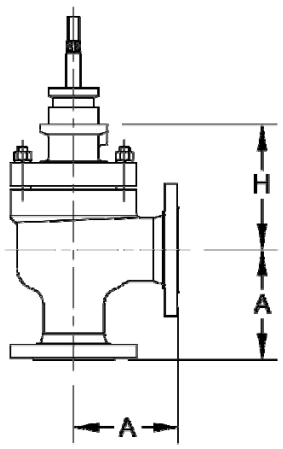
3. Other size and pressure rating grade valves : Please contact to BFS Sales Rep (Over 6" and 4500Lbs)

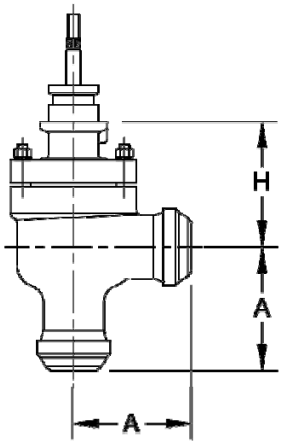
4. All dimensions are for reference only. Please consult the factory for certified dimensions.

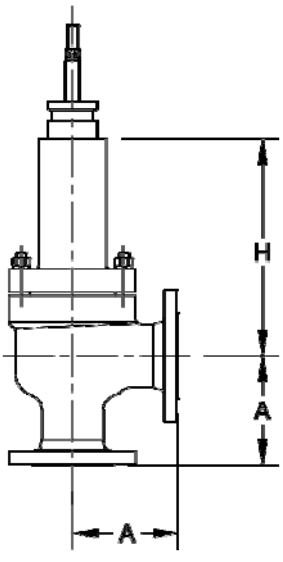
Body Dimension
SA-series
Single Ported Unbalanced Angle Body Valves

unit/mm

Valve Size	ANSI Class	A			a	H	
		RF Flange	RTJ Flange	Welding		Standard	Extension
20A(0.75")	150	98	105	105	*	155	270
	300	98	105	105	*	155	270
	600	105	105	105	*	170	296
	900	136	137	108	*	230	350
	1500	136	137	108	*	230	350
	2500	159	154	159	*	280	410
25A(1")	150	92	99	105	*	124	224
	300	99	105	105	*	124	224
	600	105	105	105	*	124	224
	900	146	146	140	*	190	290
	1500	146	146	140	*	190	290
	2500	159	159	159	*	230	330
40A(1.5")	150	111	118	126	*	145	245
	300	118	124	126	*	145	245
	600	126	126	126	*	145	245
	900	167	167	165	*	187	287
	1500	167	167	165	*	187	287
	2500	191	192	180	*	250	350
50A(2")	150	127	134	143	*	156	256
	300	134	142	143	*	156	256
	600	143	145	143	*	156	256
	900	188	189	188	*	248	348
	1500	188	189	188	*	248	348
	2500	200	202	200	*	279	379
65A(2.5")	150	138	145	156	*	195	295
	300	146	154	156	*	195	295
	600	156	157	156	*	195	295
	900	205	207	188	*	248	348
	1500	205	207	188	*	248	348
	2500	221	224	200	*	279	379
80A(3")	150	149	156	169	*	204	304
	300	159	167	169	*	204	304
	600	169	170	169	*	210	310
	900	221	222	230	*	280	380
	1500	230	232	230	*	280	380
	2500	330	333	249	*	345	445
100A(4")	150	176	183	197	*	235	335
	300	184	192	197	*	235	335
	600	197	199	197	*	243	343
	900	256	257	265	*	339	439
	1500	265	267	265	*	339	439
	2500	369	374	288	*	399	499
150A(6")	150	226	232	254	*	320	420
	300	237	245	254	*	320	420
	600	254	256	254	*	328	429
	900	357	359	384	*	425	570
	1500	384	387	384	*	425	570
	2500	432	439	410	*	500	620







*1. a * Same as to A dimensions.*

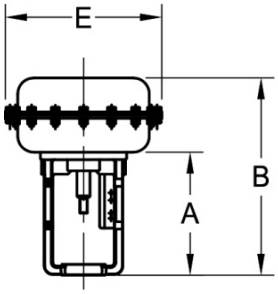
2. Standard Process Connection of Welded type : under 2" SW. Over 2" BW application.

3. Flanged End Face-to-Face dimensions are per ISA-75.08.01-2002 and 78.08.06-2002

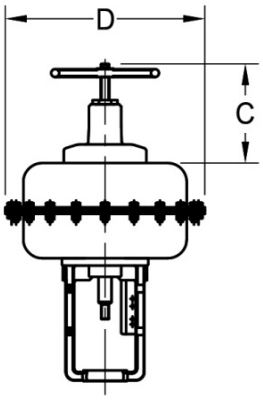
4. Other size and pressure rating grade valves : Please contact to BFS Sales Rep (Over 6" and 4500Lbs)

5. All dimensions are for reference only. Please consult the factory for certified dimensions.

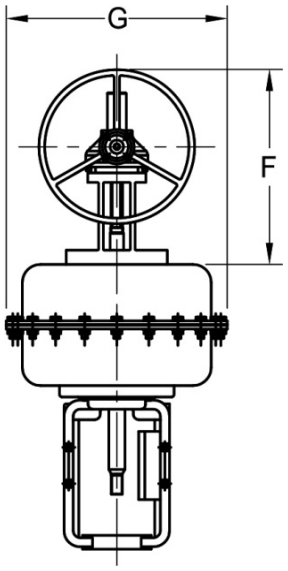
Actuator Dimensions
Pneumatic Spring Diaphragm Actuators



Standard



Top Handwheel



Top-Side Gear-Box Handwheel

Actuator Size	Actuator Dimensions (mm)							Weight (kg)	
	A	B	C	D	E	F	G	Standard	Handwheel
S1 / 250	210	340	200	230	250	-	-	14	17
S2 / 290	230	370	200	230	290	-	-	21	28
S3 / 370	230	410	200	230	370	-	-	40	49
S4 / 480	360	630	-	-	480	470	400	97	113
S5 / 550	360	680	-	-	550	470	400	125	149

** Side Mounted Handwheel.*

side mounted handwheels are available for the DD/DR-Series actuator. Contact BFS for detail and dimensions

** Manually operated actuators*

BFS offers handwheel operated actuators for applications where an mounted valve is not required or where compressed air service is unavailable

DD/DR-Series actuators are suitable for both on-off modulating service.

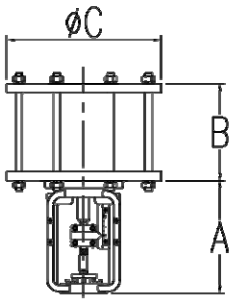
The DD/DR-Series is a pneumatic, spring-opposed diaphragm actuator operating from plant air. Excellent longterm accuracy and reliability is achieved through the use of multiple springs in the actuator.

The rugged one-piece yoke, the pressed steel diaphragm case and the special nylon reinforced diafragm provide dependable, high thrust performance. Additionally, the precisely formed diafragm eliminates friction and reduces variations in the effective area during operation which, in turn, results in exceptional linearity.

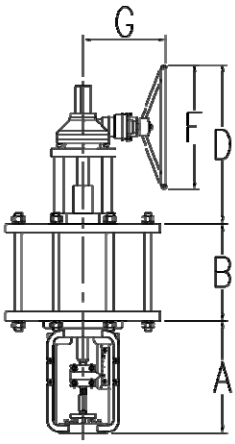
An optional top or side-mounted manual overrivde is available on both direct and reverse acting actuators.
Six different sizes of the DD/DR-Series actuators with the various accessories can virtually satisfy all application requirement.

DIMENSIONS

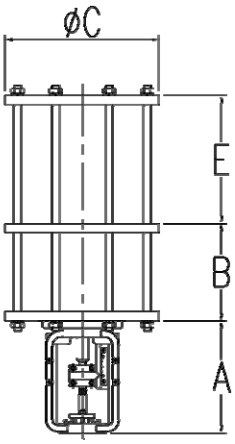
CD/CT-series / Double Acting Spring Less Type



CD-series



CD with Handwheel



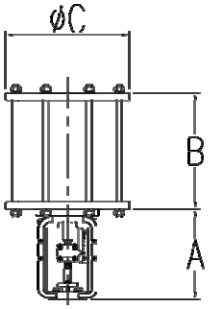
CT-series

unit/mm

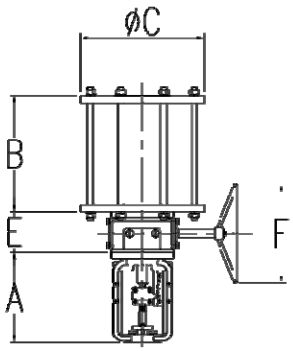
Actuator size	A	B	C	D	E	F	G
CD20/200	230	280	280	500	375	400	215
CD25/250	360	280	340	500	375	400	215
CD30/300	360	280	390	500	375	400	215
CD35/350	490	330	440	600	500	400	215
CD40/400	490	330	490	600	500	400	215
CD50/500	600	380	600	600	500	400	215

** The marked "B" dimension is standard specification. Therefore based on client requirement, the actuator is to be manufactured differehtly as optional specification*

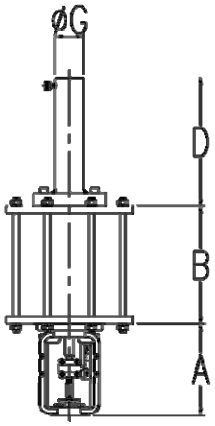
CS-series / Single Acting Spring Return Type



CS-series



CS with Handwheel



CS with Hydraulic Hand-jack

unit/mm

Actuator size	A	B	C	D	E	F	G
CS20/200	230	680	280	-	150	400	-
CS25/250	360	680	340	-	150	400	-
CS30/300	360	680	390	-	150	400	-
CS35/350	490	730	440	-	150	400	-
CS40/400	490	730	490	300	150	400	100
CS50/500	600	780	600	300	150	400	100

** The marked "B" dimension is standard specification. Therefore based on client requirement, the actuator is to be manufactured differehtly as optional specification*

Best Flow Solution

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