

**Mcsys®
Valves**

Innovation Control Valve
for Next Generation

McSYS®

S-SERIES UNBALANCED VALVE

**General Purpose Contoured P-port Valves
Tefron Body, Micro Flow, Cryogenic Service**



McSYS® *Mechanical and Fluid Control Systems*

S-Series Control Valves

The S-Series range of Valves was developed to provide a cost effective, reliable and easily maintained control valve capable of working in rigorous environments.

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

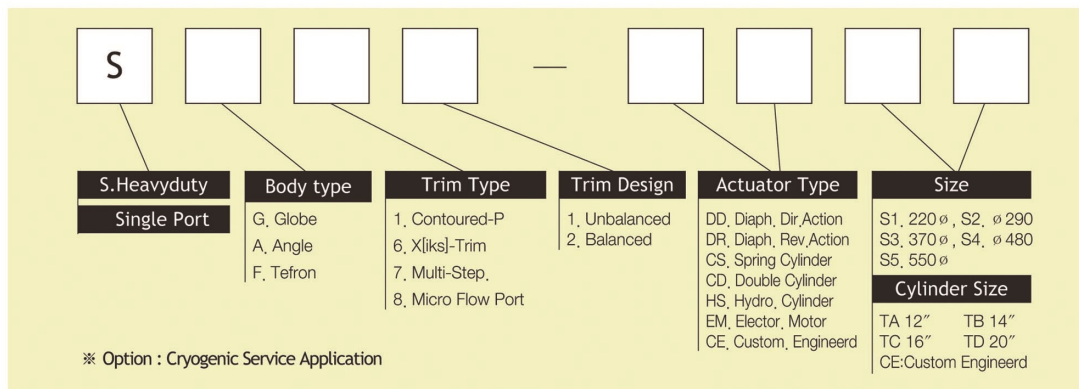
Stem guided contoured trim in both balanced and non balanced configuration gives excellent rigidity and resistance to vibration and service wear.

The valve is designed to accommodate other products within the DITO multi-hole multi stage and disk stack X[iks]-trim®.

Contents

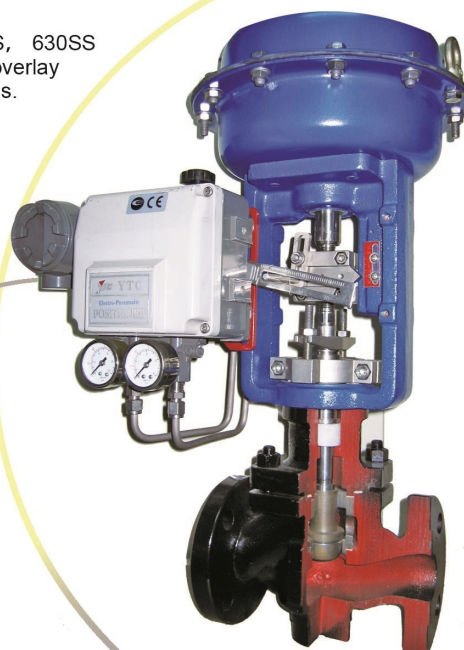
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Heavyduty Single Port Design



S-Series Specification

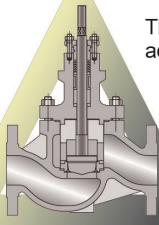
Body Size	1" to 12"
Body Style	Globe, Angle, y-Globe, Mico Flow , Cryogenic, Teflon body
Pressure Rating	ANSI 150 to 2500
Ebd Connection	Flanged, Socket welded, Butt wldded, Ring type joint, others,
Trim Design	Unbalanced
Bonnet Type	Bolted design, Pressure seal design
Seat Leakage	ANSI B16.104/FG1 70.2 Class IV(Standard),VI(Optional , Soft seat) MSS-SP-61(Optional)
Velocity Control Trim	Multi-Hole, Cascade , X[iks]-Trim
Characteristic	Equal %, Liner, Modified %, Custom-Engineerd.
Flow COfficient	See page8, 9
Standard Materials	
Bidy & Bonnet	A216 WCB/A105 A217 WC6/A182 F11, A217 WC9/ A182 F22, A182 F91 Stainless stssl, Titanium , Monel, Aluminium, Hastelloy, Aulloy, Others.
Trim	316SS, 410SS, 420SS, 420J2SS, 630SS F-11, F-22, F-91 with Stellite overlay Inconel, Others special materials.
Rangeability	15:1, 30:1, 50:1, 70:1
Acryator	Spring Diaphranm. Spring Cylinder Double Cylinder, Motor, Hydraulic



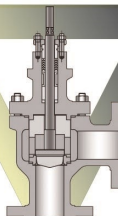
S-Series Valve Body Style

The DITO S-Series valve is available in two basic body styles of either globe angle many parts are interchangeable with the exception of the valve bodies.

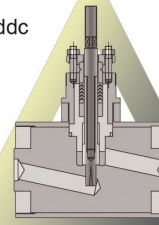
The angle pattern has an optional venturi seat which may be specified in order to provide additional protection to the valve outlet.



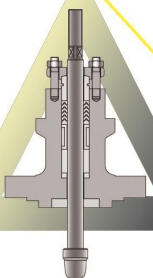
GLOBE BODY



ANGLE BODY / SA



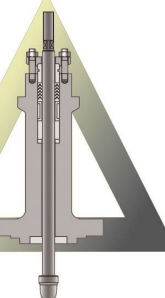
TEFLON BODY / SF



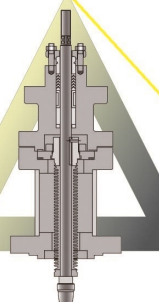
STANDARD BONNET

The standard bonnet enables the forming of a deep packing box together with a long guide housing thereby providing a robust and vibration resistant assembly. Teflon rings are the standard packing up to 250°C

Protects the packing from excessive heat or cold, which may adversely affect valve or packing performance. Application temperature range depends upon valve and bonnet construction materials.



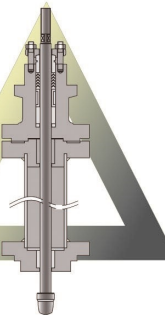
EXTENSION BONNET



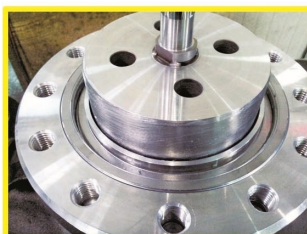
BELLOWS SEAL BONNET

Provides for a positive metallic gland seal within the rated pressure and temperature of the bellows material selected. Use on hazardous, lethal service an auxiliary packing box in the upper bonnet serves as a back up seal in the unlikely event of a bellows failure

Permits stagnated moderate temperature gas to flow within the bonnet which protects the packing from the extremes of temperature produced by the line fluid, Normally constructed in stainless steel it operates to -196°C



CRYOGENIC BONNET



S-Series Application Valve

S-Series Cryogenic Service Application

Reliability and ease of maintenance are essential features of any good control valve and to this end the DITO range of cryogenic service valves have been kept as simple as possible.

The number of components has been kept to a minimum and ease of access to the trim is straight forward through the removal of the bonnet retaining nut and lifting of 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°C (450°F). The extension can be fitted with a cold-box flange of any shape size required.

Trim construction is based on the traditional DITO top & retainer guided quick change seat design and incorporates a soft seal in PTFE or RTFE when bubble tight shut-off is required. 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 stubs 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 matter, moisture.

S-Series Microflow Control Application

Increasing technical demands by user have persuaded DITO to rethink the standard approach to his specialized field of microflow control. Possible approaches and solutions were proposed and through the process of testing both under laboratory and field conditions a new solution took form.

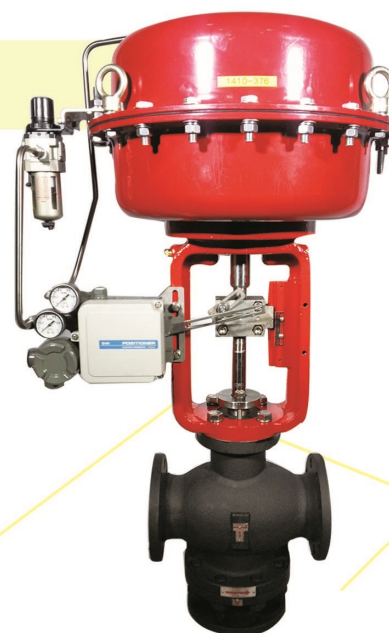
MCV are designed and manufactured for the express purpose of controlling fractions of the capacity of flow through 1" and smaller line sized. The preference of the research facilities and process industries for scaled-down dimensions with proportionate economy in cost has been the prime factor in making them available.

No omission has been made in parallel in the design, construction and characteristics of performance, interchangeability or available accessories normally associated with larger valves.

MCV are the highest quality products available for low flow control and are well suited for those applications requiring precise control in very critical areas. The valves proven ability to function under the most adverse condition makes it a vital tool in research and process as the final control element.

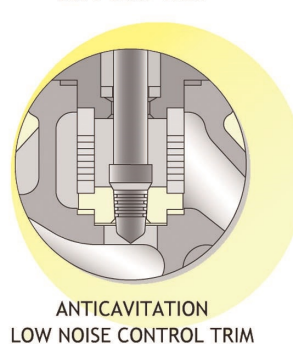
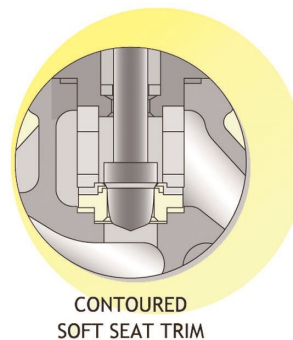
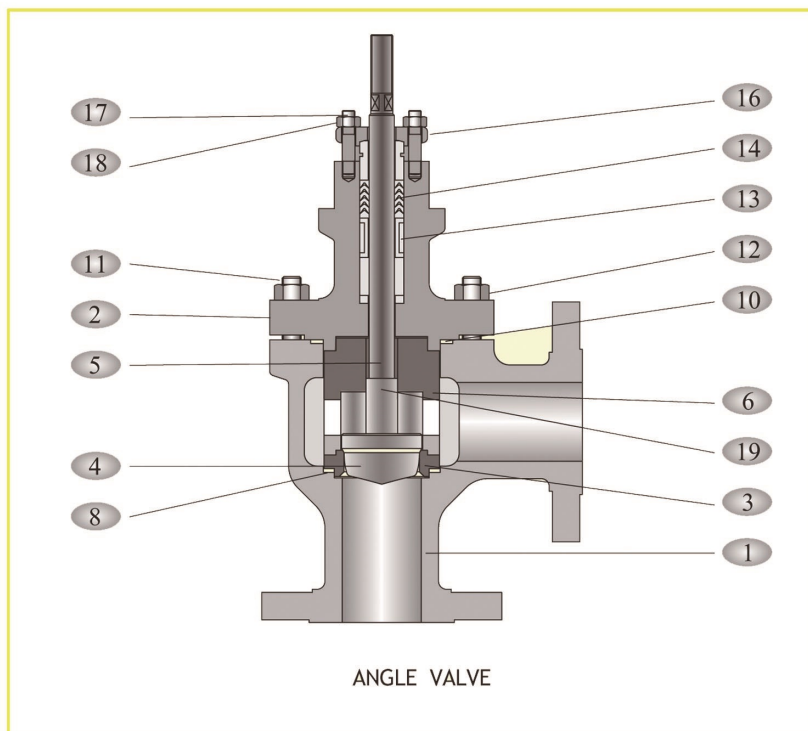
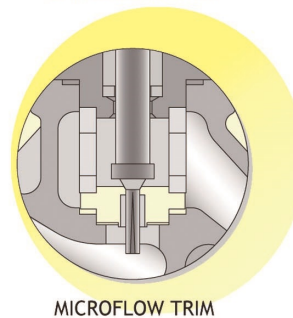
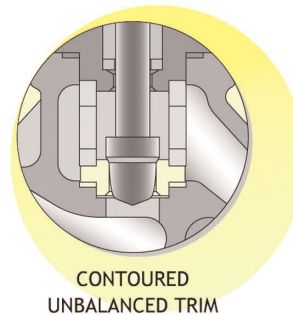
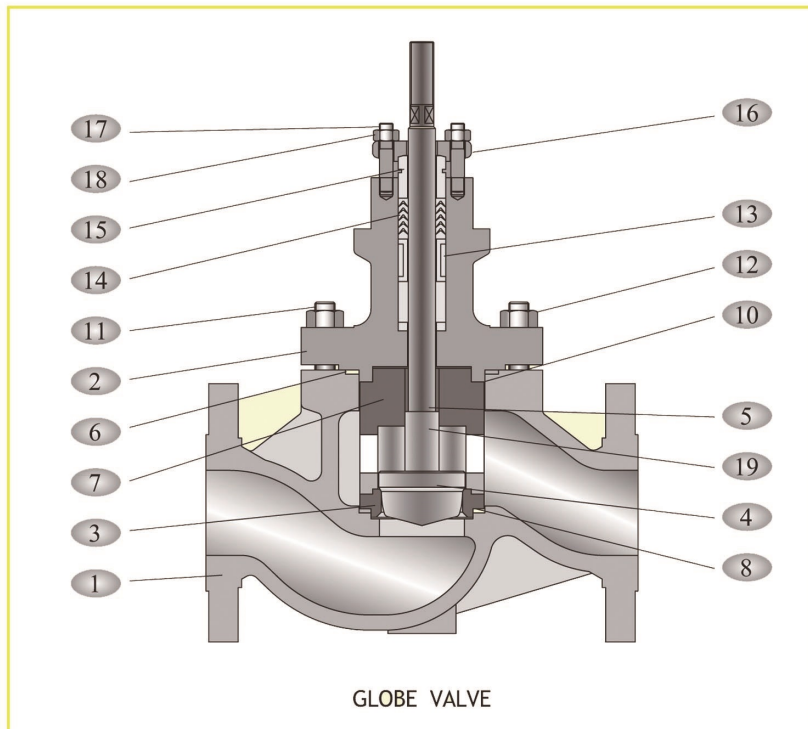
S-All Teflon Body Application

SF Series is designed for those applications where severe corrosion resistance is required. With its varied trim options and configurations, it is a most versatile valve for corrosive services, features include



S-Series Application Valve

Body Materials



S-Series Application Valve

Body Materials

Carbon Steel or Low Alloy Steel

Fluid Temperature ▶ -196 (℃) ▽		350 ▽	425 ▽	450 ▽	565 ▽
Part No.	Valve type	Temperature Range			
1	Body	A216 WCB			
		A217-WC6 or A217-WC9			
2	Bonnet	A216 WCB			
		A217-WC6 or A217-WC9			
3	Seat Ring	316SS, 316SS+Stellite			
		420J2 SS			
		630SS			
4	Plug	316SS, 316SS+Stellite			
		420J2 SS			
		630SS			
5	Plug-Stem	316SS			
6	Seat Ring Retainer	316SS			
7	Upper Seat-Ring	Retainer : 316SS			
8	Seat Ring Gasket	Spiral wounded			
9+10	Body Gasket	Spiral wounded			
11	Body Stud	A194 B7			A194 B16
12	Body Nut	A194 2H			A194 B4
13	Packing Spacer	316SS			
14	Packing	See Specification Sheet			
15	Gland Follower	316SS			
16	Packing Flange	S25C or 316SS			
17	Packing Stud	316SS			
18	Packing Nut	316SS			
19	Plug Stem Pin	316SS			

Stainless Steel

Fluid Temperature ▶ -196 (℃) ▽			350 ▽	425 ▽	450 ▽	565 ▽
Part No.	Valve type	Temperature Range				
1	Body	A351 CF8M				
2	Bonnet	A351 CF8M				
3	Seat Ring	316SS, 316SS+Stellite				
4	Plug	316SS, 316SS+Stellite				
5	Plug-Stem	316SS or 630SS				
6	Seat Ring Retainer	316SS				
7	Upper Seat Ring Retainer	316SS with Cr. Plate				
8	Seat Ring Gasket	Spiral wounded				
9+10	Body Gasket	Spiral wounded				
11	Body Stud	A193 B8				630SS
12	Body Nut	316SS				316SS
13	Packing Spacer	S25C or 316SS				
14	Packing	See Specification sheet				
15	Gland Follower	316SS				
17	Packing Stud	316SS				
18	Packing Nut	316SS				
19	Plug stem Pin	316SS				

Application Valve

S-Series Application Valve

Micro Flow Cv Chart

Micro Flow Trim

Trim No.	Flow Coefficient Cv							Spring Range psi	Max. Supply psi	Critical Flow Min. FL
	Min	Intermediate Cv					Max			
9	0,0016	0,002	0,0024	0,0028	0,0032	0,0036	0,004	3-15	18,0	0,85
8	0,004	0,005	0,006	0,007	0,008	0,009	0,010	3-15	18,0	0,85
7	0,010	0,013	0,016	0,019	0,021	0,023	0,025	3-15	18,0	0,85
6	0,020	0,025	0,030	0,035	0,040	0,045	0,050	3-15	18,0	0,85
5	0,04	0,05	0,06	0,07	0,08	0,09	0,10	3-15	18,0	0,85
4	0,10	0,13	0,16	0,19	0,21	0,23	0,25	3-15	18,0	0,90
3	0,25	0,30	0,35	0,40	0,45	0,50	0,55	6-24	30,0	0,90
2	0,5	0,6	0,7	0,8	0,9	1,0	1,1	6-24	30,0	0,92
1	0,9	1,1	1,3	1,5	1,7	1,9	2,1	6-24	30,0	0,92
0	1,5	1,9	2,3	2,6	2,9	3,2	3,8	6-24	30,0	0,92

Anti-Cavitation Trim

LINEAR

Trim No.	Flow Coefficient Cv							Spring Range psi	Max. Supply psi	Critical Flow Min. FL
	Min	Intermediate Cv					Max			
C6	0,02	0,025	0,030	0,035	0,04	0,045	0,05	6-24	30,0	2900
C5	0,04	0,05	0,06	0,07	0,08	0,09	0,10	6-24	30,0	2900
C4	0,10	0,13	0,16	0,19	0,21	0,23	0,25	6-24	30,0	2900
C3	0,25	0,30	0,35	0,40	0,45	0,50	0,55	6-24	30,0	1450

Note : Upstream pressure P₁ must not exceed ▲ P max on the rating of flanges.

Ultra Microflow Trim

Valve Size	Trim No.	CV Coefficients	Rangeability		Orifice Diameter	Port Area m ²
			Linear	Eq %		
1/4"	U1	0,001	15 : 1	N / A	0,0625	0,0031
	U2	0,006	15 : 1	N / A	0,0625	0,0031
	U3	0,004	15 : 1	N / A	0,0625	0,0031
1/2"	U4	0,00027	15 : 1	N / A	0,0625	0,0031
3/4"	U5	0,00018	15 : 1	N / A	0,0625	0,0031
	U6	0,00012	15 : 1	N / A	0,0625	0,0031
	U7	0,00008	15 : 1	N / A	0,0625	0,0031
1/4"	U8	0,00005	15 : 1	N / A	0,0625	0,0014
	U9	0,000036	15 : 1	N / A	0,042	0,0014

Option : Rated Cv 0,000024, 0,000006, 0,000004 Rangeability 15:1 Orifice Dia 0,042" Port Area 0,0014m²

S-Series Application Valve

Travel Chart

Contoured Trim / Globe & Angle Valves

Linear

Percent of Travel			10	20	30	40	50	60	70	80	90	100
FL			0.93	0.93	0.92	0.92	0.91	0.91	0.91	0.90	0.90	0.90
Valve Size	Orifice Dia	Travel (mm)	Rated Cv									
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"		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	1.470	1.808	2.147	2.485	2.823	3.162	3.5
	0.500"	20	0.650	1.133	1.617	2.100	2.583	3.067	3.550	4.033	4.517	5.0
1"	0.750"		1.170	2.040	2.910	3.780	4.650	5.520	6.390	7.260	8.130	9.0
	1.000"		2.080	3.627	5.173	6.720	8.267	9.813	11.360	12.907	14.453	16.0
1-1/2"	1"	20/30	3.250	5.667	8.083	10.500	12.917	15.333	17.750	20.167	22.583	25.0
	1.580"		4.550	7.933	11.317	14.700	18.083	21.467	24.850	28.233	31.617	35.0
2"	1.580"	30	4.94	8.61	12.29	15.96	19.63	23.31	26.98	30.65	34.33	38.0
	2.000"		6.11	10.65	15.20	19.74	24.28	28.83	33.37	37.91	42.46	47.0
2-1/2"	2.000"	30/40	6.50	11.33	16.17	21.00	25.83	30.67	35.50	40.33	45.17	50.0
	2.500"		9.49	16.55	23.60	30.66	37.72	44.77	51.83	58.89	65.94	73.0
3"	2.000"	30/40	7.15	12.47	17.78	23.10	28.42	33.73	38.05	44.37	49.68	55.0
	3.000"		13.65	23.80	33.95	44.10	54.25	64.40	74.55	84.70	94.85	105.0
4"	3.150"	40/50	14.30	24.93	35.57	46.20	56.83	67.47	78.10	88.73	99.37	110.0
	4.000"		24.70	43.07	61.43	79.80	98.17	116.53	134.90	153.27	171.63	190.0
9"	4.000"	40/50	26.00	45.33	64.67	84.00	103.33	122.67	142.00	161.33	180.67	200.0
	6.000"	50/70	98.67	98.67	129.33	168.00	206.67	245.33	284.00	322.67	361.33	400.0

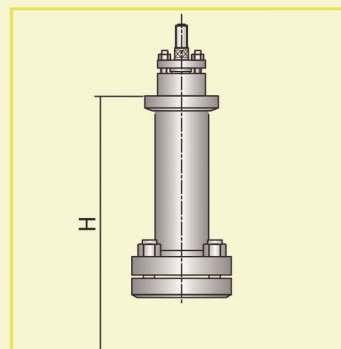
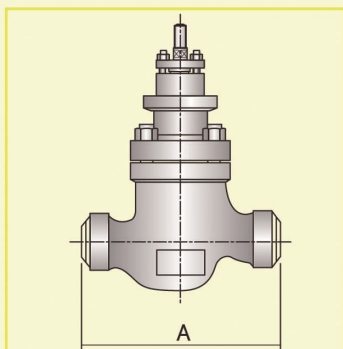
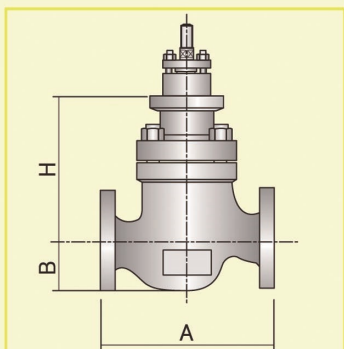
Contoured Trim / Globe & Angle Valves

Equal %

Percent of Travel			10	20	30	40	50	60	70	80	90	100
FL			0.93	0.93	0.93	0.93	0.93	0.92	0.92	0.90	0.90	0.90
Valve Size	Orifice Dia	Travel (mm)	Rated Cv									
3/4, 1"	0.250"		0.015	0.200	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"	20	0.164	0.230	0.324	0.455	0.639	0.898	1.262	1.773	2.491	3.5
	0.500"		0.234	0.329	0.462	0.650	0.913	1.283	1.802	2.533	3.558	5.0
1"	0.750"		0.422	0.592	0.832	1.169	1.643	2.309	3.244	4.559	6.405	9.0
	1.000"		0.749	1.053	1.480	2.079	2.921	4.105	5.767	8.104	11.387	16.0
1-1/2"	1"	20/30	1.171	1.645	2.312	3.248	4.564	6.413	9.012	12.662	17.792	25.0
	1.580"		1.640	2.300	3.240	4.550	6.390	8.980	12.620	17.730	24.910	35.0
2"	1.580"	30	1.78	2.50	3.51	4.94	6.94	9.75	13.70	19.25	27.04	38.0
	2.000"		2.20	3.09	4.35	6.11	8.58	12.06	16.94	23.81	33.45	47.0
2-1/2"	2.000"	30/40	2.34	3.29	4.62	6.50	9.13	12.83	18.02	25.32	35.58	50.0
	2.500"		3.28	4.61	6.47	9.09	12.78	17.96	25.23	35.45	49.82	70.0
3"	2.000"	30/40	3.33	4.67	6.56	9.23	12.96	18.21	25.93	35.96	50.53	71.0
	3.000"		4.92	6.91	9.71	13.64	19.17	26.94	37.85	53.18	74.73	105.0
4"	3.150"	40/50	5.15	7.24	10.17	14.29	20.08	28.22	39.65	55.71	78.28	110.0
	4.000"		8.90	12.50	17.57	24.69	34.69	48.74	68.49	96.23	135.22	190.0
6"	4.000"	40/50	9.18	12.90	18.12	25.48	35.78	50.28	70.65	99.27	139.49	196.0
	6.000"	50/70	18.73	26.32	36.99	51.97	70.59	102.62	144.19	202.60	284.67	400.0

Dimensions

ANSI Class 150~600



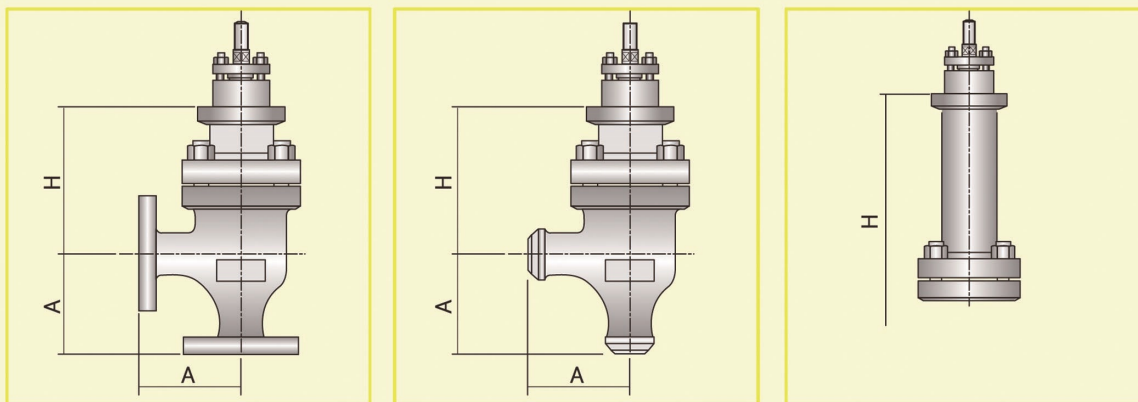
valve Size (inch)	A						B		H			
	ANSI Class 150		ANSI Class 300		ANSI Class 600		ANSI Class 150~300	ANSI Class 600	ANSI Class 150~300		ANSI Class 600	
	Rf	Welding	Rf	Welding	Rf	Welding			Standard Bonnet	Extension Bonnet	Standard Bonnet	Extension Bonnet
1/2"	184	206	190	206	203	206	50	50	150	260	155	270
3/4"	184	210	194	210	206	210	50	50	155	270	170	296
1"	184	210	197	210	210	210	55	55	155	270	170	296
1.5"	222	251	235	251	251	251	62	72	190	315	206	350
2"	254	286	267	286	286	286	75	80	255	370	270	402
2.5"	276	292	292	292	311	311	90	100	276	380	295	430
3"	298	318	318	318	337	337	110	120	280	390	320	454
4"	352	368	368	368	394	394	110	140	320	440	346	488
6"	451	473	473	473	508	508	170	182	385	451	398	520
8"	543		568		610	610						
10"	673		708		752	752						

unit/mm

valve Size (inch)	A						B		H			
	ANSI Class 900		ANSI Class 1500		ANSI Class 2500		ANSI Class 900~1500	ANSI Class 600	ANSI Class 900~1500		ANSI Class 2500	
	Rf	Welding	Rf	Welding	Rf	Welding			Welding	Extension Bonnet	Welding	Extension Bonnet
3/4"	273	279	273	279	318	318	60	70	230	350	280	410
1"	273	279	273	279	318	318	70	80	230	350	280	410
1.5"	333	330	333	330	381	381	80	100	265	390	320	474
2"	375	375	375	375	400	400	100	120	280	440	355	515
2.5"	410	410	410	410	441	441	120	135	324	480	380	568
3"	441	460	460	460	660	660	140	150	360	540	446	630
4"	511	530	530	530	737	737	170	185	405	636	498	715
6"	714	768	768	768	864	864	220	230	510	720	562	850

Dimensions

ANSI Class 150~600



unit/mm

valve Size (inch)	A						H			
	ANSI Class 150		ANSI Class 300		ANSI Class 600		ANSI Class 150~300		ANSI Class 600	
	Rf	Rf	Rf	Rf	Rf	Rf	Extension Bonnet	Extension Bonnet	Extension Bonnet	Extension Bonnet
3/4"	98	98	98	98	105	210	155	270	170	296
1"	98	98	98	98	105	210	155	270	170	296
1.5"	112	126	126	126	126	251	190	315	206	350
2"	127	132	132	132	143	143	230	370	270	402
2.5"	138	146	146	146	156	156	276	380	295	430
3"	149	159	159	159	169	169	280	390	320	454
4"	176	184	184	184	197	197	320	440	346	488
6"	226	238	238	238	254	254	385	451	398	520

ANSI Class 900~2500

unit/mm

valve Size (inch)	A						H			
	ANSI Class 150		ANSI Class 300		ANSI Class 600		ANSI Class 150~300		ANSI Class 600	
	Rf	Rf	Rf	Rf	Rf	Rf	Extension Bonnet	Extension Bonnet	Extension Bonnet	Extension Bonnet
3/4"	36	139	136	139	59	159	230	350	280	410
1"	136	139	136	139	159	159	230	350	280	410
1.5"	166	166	166	166	191	191	265	390	320	474
2"	187	187	187	187	205	205	280	440	355	515
2.5"	205	205	205	205	221	221	324	480	380	568
3"	230	230	230	230	330	330	360	540	446	630
4"	265	265	265	265	369	369	405	636	498	715
6"	384	384	384	384	432	432	510	720	562	850



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