



Globe & Angle Control Valves

7000 SERIES / 8000 SERIES



ATEX



PED

INNOBIZ
Innovation Association

Venture for
Tomorrow



UNIFLO

Control Valve

This versatile design can be used for compressible and non-compressible fluid service application in valve sizes ranging from 3/4 through 18" in pressure classes 1500, 2500, 3000, 4500.

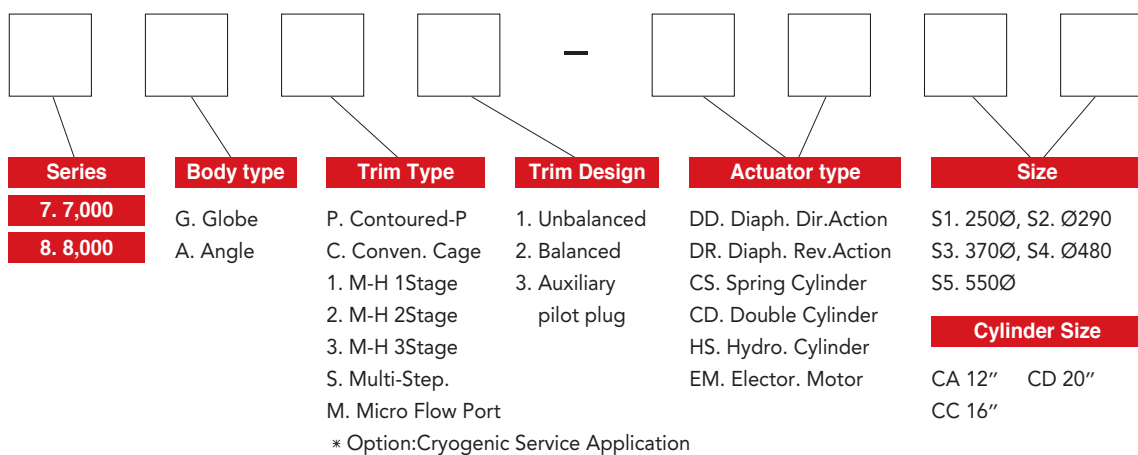
7000, 8000-Series valves are supplied with either direct or reverse acting actuators plus a number of optional accessories to satisfy most final control element requirements. Our 7000, 8000-Series valves also permits interchangeability of actuators and trim types within certain valve sizes for simplifying control changes in the field. This feature combined with a wide selection of standard and optional trim assemblies provides optimum control and has proven to be economical should field conversion be necessary.

UniFlo engineers long experience success with fluid control devices carries through with the 7000, 8000-Series control valve & Actuator series to meet the needs of the power and process industries.

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Model Numbering System

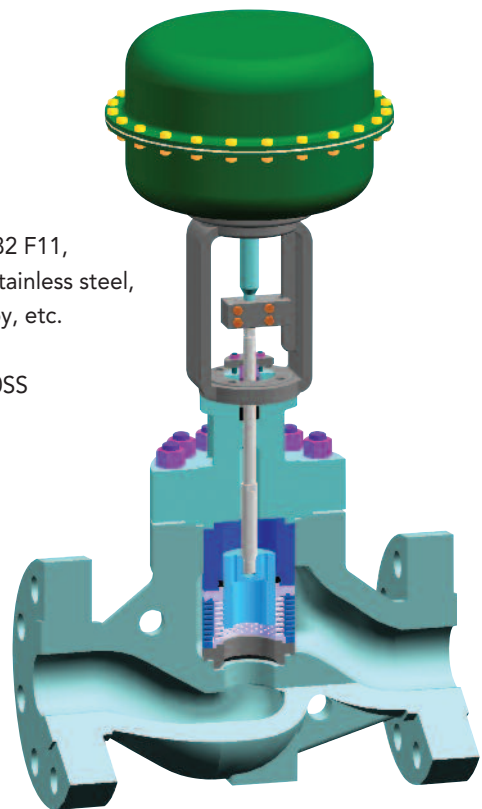


Specification

Body Size	1" to 20" (Optional / up to 36")
Body Style	Globe, Angle
Pressure Rating	ANSI Class 150 to 2500, 3000, 4500
End Connection	Flanged, Socket welded, Butt welded, Ring joint type, etc.
Trim Design	Unbalanced, Balanced and Auxiliary pilot Conventional Cage, Multi-hole 1stage, Multi-hole 2stages, Multi-hole 3stages Multi Step, Micro Flow Port.
Bonnet Type	Bolted design, Pressure seal design Standard, Extension, Cryogenic, Bellows seal
Seat Leakage	ANSI B16.34 / FCI 20-1 Class IV(Standard), V(Optional), VI(Optional, Soft seat) MSS-SP-61(Optional)
Characteristic	Equal %, Linear, Modified %, Quick opening Custom engineered

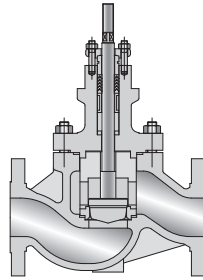
Standard Materials

Body & Bonnet	A216 WCB / A105, A217 WC6 / A182 F11, A217 WC9 / A182 F22, A182 F91, Stainless steel, Tungsten, Titanium, Monel, Hastelloy, etc.
Trim	316SS, 410SS, 420SS, 420J2 SS, 630SS F-11, F-22, F-91 with Stellite overlay Inconel, Others special materials.
Balance Seal	RTFE "U" Seal Carbon with metal seal Graphite with Inconel seal
Rangeability	15:1, 30:1, 50:1 to 800:1 Custom engineered

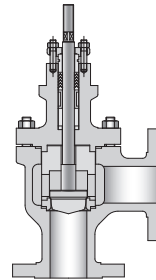


7000 Series Body Valve

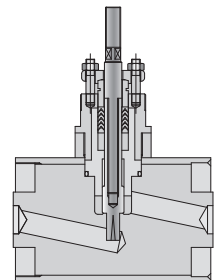
The 7000-Series valve is available in two basic body styles of either globe angle many parts are interchangeable with the exception of the valve bodies. The angle pattern has an optional ventri seat which may be specified in order to provide additional protection to the valve outlet.



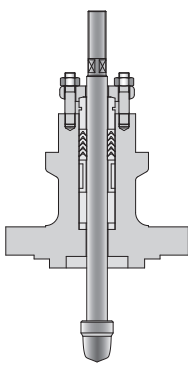
GLOBE BODY



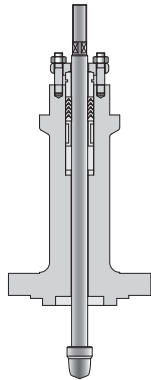
ANGLE BODY



TEFLON BODY



STANDARD BONNET



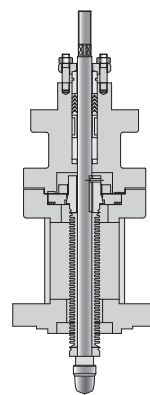
EXTENSION BONNET

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

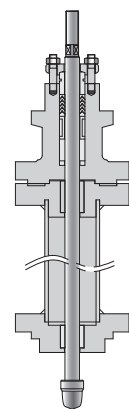
Protects the packing from excessive heat or cold, which may adversely affect valve or packing performance. Application temperature range depends upon valve and bonnet construction materials.

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 form within the bonnet which protects the packing from the extremes of temperature produced by the line fluid. Normally constructed in stainless steel it operated to -196°C.



BELLOWS SEAL BONNET



CRYOGENIC BONNET

7000 Series Body Valve

7000 Series Cryogenic Service Application

Reliability and ease of maintenance are essential features of any good control valve and to this end the UniFlo 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 UniFlo 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, screw, 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.

7000 Series Microflow Control Application

Increasing technical demands by user have persuaded UniFlo to rethink the standard approach to this 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 from 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 paralleling 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 conditions makes it a vital tool in research and process as the final control element.

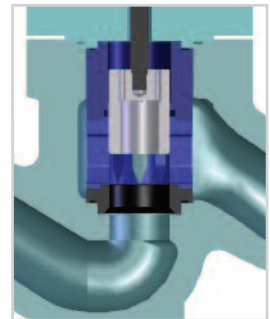
At All Teflon Body Application

AT 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.

8000 Series General Application

Conventional cage / balanced single seat port throttle

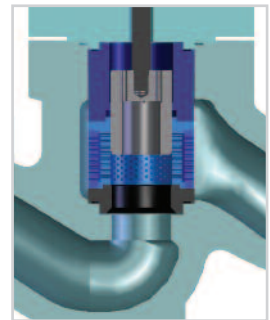
General purpose cage guided valve trim which can be used in most clean compressible and non-compressible fluid services for both modulating and on/off control. The balanced plug design reduces actuator force requirements thus permitting use of smaller, less expensive actuators while maintaining tight shut-off capability.



Conventional Cage

Multi-hole 1stage, 2stages Trim

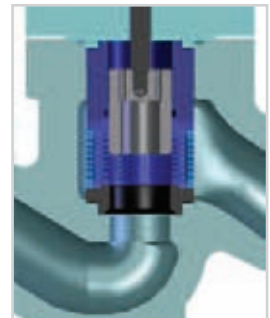
This trim offers some of the advantages of the multiple stages Multi Hole Trim. Single stage trim reduces the damaging effects of flashing and cavitation when used with compressible and non-compressible fluids. Turn down ratio, seat leakage, dBA levels, flashing and cavitation reduction are based upon the individual design criteria of each trim. The single stage trim can be used in place of other port throttling trim styles, size available in 2inch through 18" valves with balanced and unbalanced plugs. / Option 20"~36".



Multi-hole 2stages

Multi-hole 3stage Trim

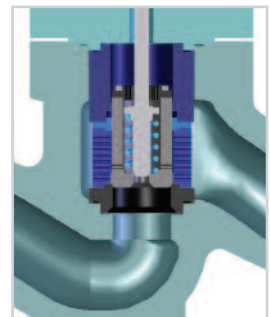
UniFlo multi-hole multi-stage trim assembly in unbalanced or balanced single seat designs provides multiple pressure breakdowns for noise abatement in critical pressure drop steam or gas applications. This trim is also equally effective in high pressure drop liquid applications for preventing cavitation and trim erosion damage.



Multi-hole 3stages

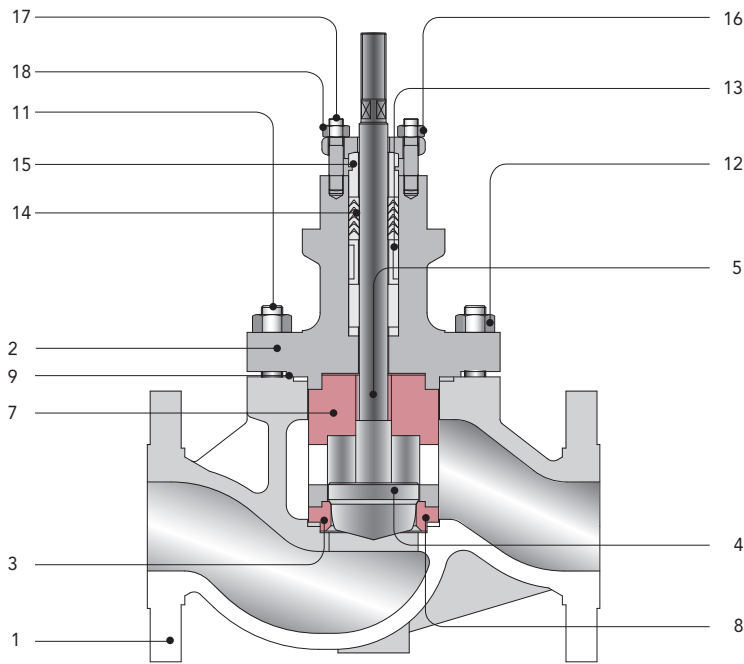
Auxiliary pilot plug trim

The trim is designed primarily for high pressure differential applications where tight shut-off is essential. Such applications include steam and water pressure reduction, steam throttling to atmosphere or to condenser, isolation, super-critical boiler start-up and variety of other uses in steam and water control system. The design of the APT trim provides tight shut-off, excellent control and rangeability, but requires low actuator thrust which provides rapid response. It is also lower in cost. The trim is basically a port throttling single seat design with main and pilot plugs working in APT. The large main plug is the control device. Inside the main plug is the pilot plug connected rigidly to the valve stem, when closing the main plug seats first as a large balanced plug and this is rapidly followed by the closing of the pilot plug. At this point, the plug from an unbalanced assembly and up stream pressure helps create high seating force resulting in reliable shut-off as high as class V. To open the actuator need only lift the small pilot plug to cause the main plug to once again become balanced.

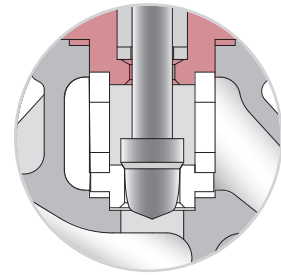


Auxiliary Pilot Trim / APT With 1stage

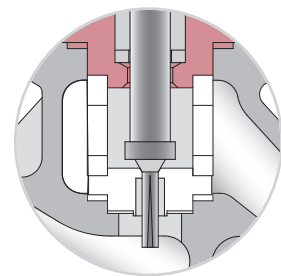
7000 Series Body Materials



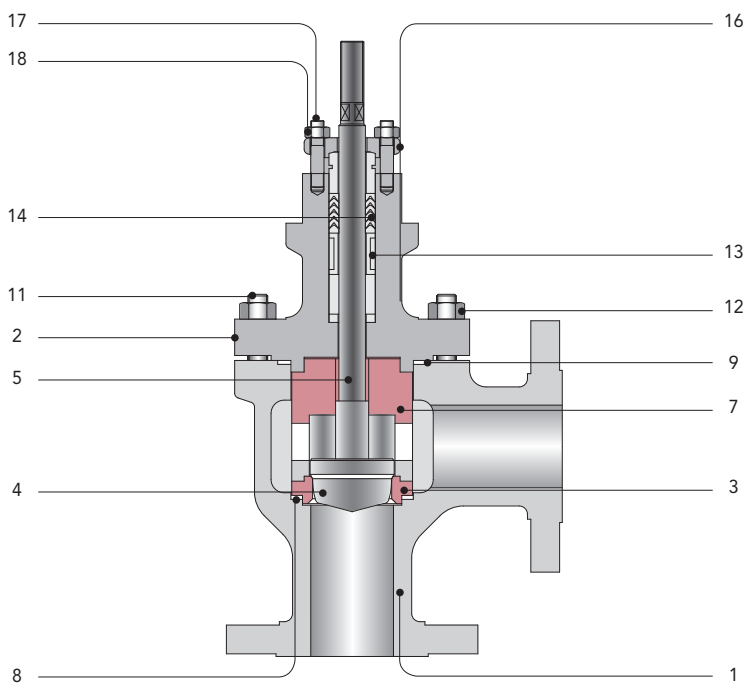
Globe valve



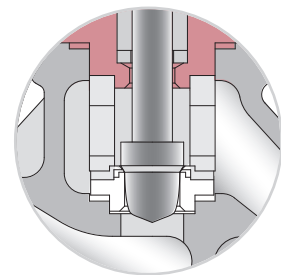
Contoured Unbalanced Trim



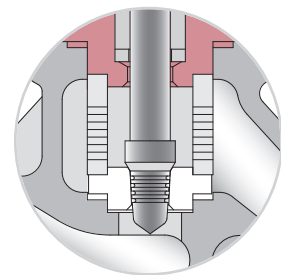
Microflow Trim



Angle valve

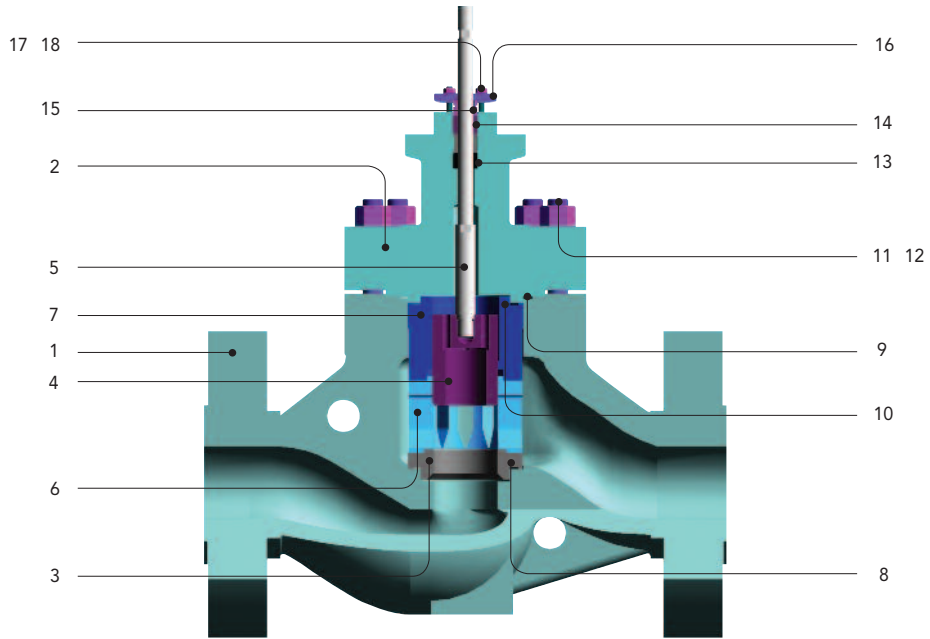


Contoured Soft Seat Trim

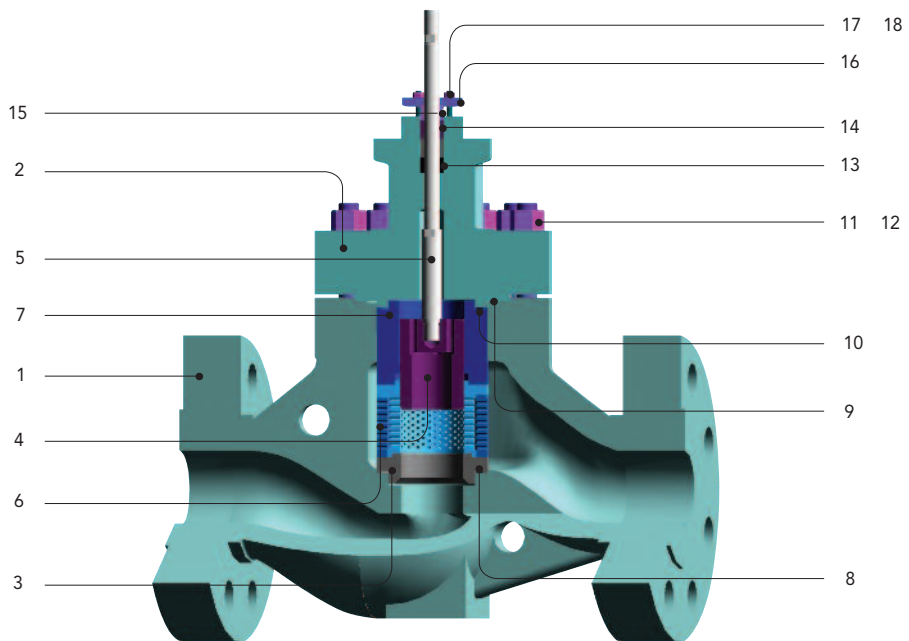


Anticavitation Low Noise Control Trim

8000 Series Body Materials



Conventional Cage Valve



Multihole Control Valve

7000 Series Materials Selection Information

Carbon Steel or Low Alloy Steel

Part No.	Valve type	Fluid Temperature -196	350	425	450	565
		(°C) ▾	▽	▽	▽	▽
		Temperature Range				
1	Body	A216 WCB A217 WC6 or A217 WC9				
2	Bonnet	A216 WCB A217 WC6 or A217 WC9				
3	Seat Ring	316 SS, 316 SS+Stellite #6 H.F. 410 SS, 630 SS, F11+ Stellite #6 H.F, F22+Stellite #6 H.F, INCONEL				
4	Plug	316 SS, 316 SS+Stellite #6 H.F. 410 SS, 630 SS, F11+ Stellite #6 H.F, F22+Stellite #6 H.F, INCONEL				
5	Plug-Stem	316 SS, 410 SS, 630 SS, INCONEL				
7	Retainer	316 SS, 410 SS				
8	Seat Gasket	Spiral Wounded				
9	Body Gasket	Spiral Wounded				
11	Body Stud	A194 B7				
12	Body Nut	A194 2H				
13	Packing Spacer	304 SS				
14	Packing	V-PTFE, GRAPHITE				
15	Gland Follower	304 SS				
16	Packing Flange	304 SS				
17	Packing Stud	A193 B8				
18	Packing Nut	A194 8				

Stainless Steel

Part No.	Valve type	Fluid Temperature -196	350	425	450	565
		(°C) ▾	▽	▽	▽	▽
		Temperature Range				
1	Body	A351 CF8M				
2	Bonnet	A351 CF8M				
3	Seat Ring	316 SS, 316 SS+Stellite #6 H.F.				
4	Plug	316 SS, 316 SS+Stellite #6 H.F.				
5	Plug-Stem	316 SS, 316 SS + Cr. Plate				
7	Retainer	316 SS + Cr. Plate				
8	Seat Gasket	Spiral Wounded				
9	Body Gasket	Spiral Wounded				
11	Body Stud	A194 B8				
12	Body Nut	A194 8				
13	Packing Spacer	304 SS				
14	Packing	V-PTFE, GRAPHITE				
15	Gland Follower	304 SS				
16	Packing Flange	304 SS				
17	Packing Stud	A193 B8				
18	Packing Nut	A194 8				

8000 Series Materials Selection Information

Carbon Steel or Low Alloy Steel

Part No.	Valve type	Fluid Temperature -196	350	425	450	565
		(°C) ▾	▽	▽	▽	▽
		Temperature Range				
1	Body	A216 WCB A217 WC6 or A217 WC9				
2	Bonnet	A216 WCB A217 WC6 or A217 WC9				
3	Seat Ring	316 SS, 316 SS+Stellite #6 H.F. 410 SS, 630 SS, F11+ Stellite #6 H.F, F22+Stellite #6 H.F, INCONEL				
4	Plug	316 SS, 316 SS+Stellite #6 H.F. 410 SS, 630 SS, F11+ Stellite #6 H.F, F22+Stellite #6 H.F, INCONEL				
5	Plug-Stem	316 SS, 410 SS, 630 SS, INCONEL				
6	Cage	316 SS, 410 SS				
7	Bal. Cylinder	316 SS, 410 SS				
8	Seat Gasket	Spiral Wounded				
9+10	Body Gasket	Spiral Wounded				
11	Body Stud	A194 B7				
12	Body Nut	A194 2H				
13	Packing Spacer	304 SS				
14	Packing	V-PTFE, GRAPHITE				
15	Gland Follower	304 SS				
16	Packing Flange	304 SS				
17	Packing Stud	A193 B8				
18	Packing Nut	A194 8				

Stainless Steel

Part No.	Valve type	Fluid Temperature -196	350	425	450	565
		(°C) ▾	▽	▽	▽	▽
		Temperature Range				
1	Body	A351 CF8M				
2	Bonnet	A351 CF8M				
3	Seat Ring	316 SS, 316 SS+Stellite #6 H.F				
4	Plug	316 SS, 316 SS+Stellite #6 H.F				
5	Plug-Stem	316 SS, 316 SS + Cr. Plate				
6	Cage	316 SS				
7	Bal. Cylinder	316 SS + Cr. Plate				
8	Seat Gasket	Spiral Wounded				
9+10	Body Gasket	Spiral Wounded				
11	Body Stud	A194 B8				
12	Body Nut	A194 8				
13	Packing Spacer	304 SS				
14	Packing	V-PTFE, GRAPHITE				
15	Gland Follower	304 SS				
16	Packing Flange	304 SS				
17	Packing Stud	A193 B8				
18	Packing Nut	A194 8				

General Selection Information

Trim Cv Calculation

A full description of the procedures use for calculating the Cv on various is detailed in the UniFlo sizing & selection program.

Body Selection

Generally, the valve body must be capable of supporting the selected trim design without producing excessive velocity. The following tables can be used as a guide for determining the maximum recommended body velocities for liquid and gas/vapor applications.

Recommended maximum inlet and outlet velocities for liquid service

Maximum Recommended Velocity						
Valve Size	Valve Body Material					
	Carbon Steel		Alloy Steel		Cu / Ni Alloys	
	m / s	Ft / s	m / s	Ft / s	m / s	Ft / s
1"~12" / 25A~300A	13.1	43	15.8	52	7.6	25
14"~24" / 350A~600A	10.7	35	13.1	43	6.4	21
Above 24"	7.6	25	10.7	35	4.6	15

Recommended maximum inlet and outlet velocities for gas/vapor service

Maximum Recommended Velocity					
Allowable Noise Level(dBA)	Inlet		Outlet		Mach Number
	m / s	Ft / s	m / s	Ft / s	
< 85	144	475	253	830	0.3

Trim Inherent Rangeability

The inherent rangeability of a valve trim is dependent on a number of factors including size and style. The valves detailed below table provide a general guideline to the maximum achievable values.

Trim Size	Standard Rangeability
Up to 8"	50 : 1
Up to 8"	60 : 1
Up to 8"	70 : 1
Up to 8"	80 : 1
Special Application Maximum Rangeability	800 : 1

7000 Series 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

Linear

Anti-Cavitation Trim

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

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
1/4"	U7	0.00008	15 : 1	N / A	0.0625	0.0031
	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

7000 Series Cv, FL Travel Chart

Linear

Contoured Trim / Globe & Angle Valves												
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"	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	1.480	1.808	2.148	2.485	2.823	3.152	3.5
	0.500"		0.650	1.133	1.617	2.100	2.583	3.067	3.550	4.033	4.517	5.0
	0.750"		1.170	2.040	2.910	3.780	4.650	5.520	6.390	7.260	8.130	9.0
1"	1.000"		2.080	3.627	5.173	6.720	8.267	9.813	11.360	12.167	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	172.63	190.0
6"	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

Equal %

Contoured Trim / Globe & Angle Valves												
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"	20	0.015	0.200	0.028	0.039	0.055	0.077	0.108	0.152	0.214	0.3
	0.375"		0.038	0.053	0.074	0.104	0.146	0.205	0.288	0.405	0.569	0.8
	0.500"		0.164	0.230	0.324	0.455	0.639	0.898	1.262	1.773	2.491	3.5
	0.750"		0.234	0.329	0.462	0.650	0.913	1.283	1.802	2.533	3.558	5.0
	1"		1.000"	0.422	0.592	0.832	1.169	1.643	2.309	3.244	4.559	6.405
1-1/2"	1"	20/30	0.749	1.053	1.480	2.079	2.921	4.105	5.767	8.104	11.387	16.0
	1.580"		1.171	1.645	2.312	3.248	4.564	6.413	9.012	12.662	17.792	25.0
2"	1.580"	30	1.640	2.300	3.240	4.550	6.390	8.980	12.620	17.730	24.910	35.0
	2.000"		1.78	2.50	3.51	4.94	6.94	9.75	13.70	19.25	27.04	38.0
2-1/2"	2.000"	30/40	2.20	3.09	4.35	6.11	8.58	12.06	16.94	23.81	33.45	47.0
	2.500"		2.34	3.29	4.62	6.50	9.13	12.83	18.02	25.32	35.58	50.0
3"	2.000"	30/40	3.28	4.61	6.47	9.09	12.78	17.96	25.23	35.45	49.82	70.0
	3.000"		3.33	4.67	6.56	9.23	12.96	18.21	25.93	35.96	50.53	71.0
4"	3.150"	40/50	4.92	6.91	9.71	13.64	19.17	26.94	37.85	53.18	74.73	105.0
	4.000"		5.15	7.24	10.17	14.29	20.08	28.22	39.65	55.71	78.28	110.0
6"	4.000"	40/50	8.90	12.50	17.57	24.69	34.69	48.74	68.49	96.23	135.22	190.0
	6.000"	50/70	9.18	12.90	18.12	25.48	35.78	50.28	70.65	99.27	139.49	196.0

8000 Series Cv, FL Travel Chart

Linear _ Standard Type

Percent of Travel			10	20	30	40	50	60	70	80	90	100
FL			0.94	0.94	0.93	0.93	0.92	0.92	0.91	0.91	0.90	0.90
Valve Size	Orifice Dia	Travel(mm)	Rated Cv									
1-1/2"	1.58"	20/30	4.55	7.93	11.32	14.70	18.08	21.47	24.85	28.23	31.62	35.0
2"	1.97"	30	6.11	10.65	15.20	19.74	24.28	28.83	33.37	37.91	42.46	47.0
2-1/2"	2.50"	30/40	9.49	16.55	23.60	30.66	37.72	44.77	51.83	58.89	65.94	73.0
3"	2.00"	30/40	7.15	12.47	17.78	23.10	28.42	33.73	39.05	44.37	49.68	55.0
	3.15"		13.65	23.80	33.95	44.10	54.25	64.40	74.55	84.70	94.85	105.0
4"	3.15"	40/50	14.30	24.93	35.57	46.20	56.83	67.47	78.10	88.73	99.37	110.0
	3.94"		24.70	43.08	61.43	79.80	98.17	116.53	134.90	153.27	171.63	190.0
6"	3.94"	40/50	26.0	45.3	64.7	84.0	103.3	122.7	142.0	161.3	180.7	200.0
	5.98"	50/70	52.0	98.7	129.3	168.0	206.7	245.3	284.0	322.7	361.3	400.0
8"	7.80"	70	70.2	122.4	174.6	226.8	279.0	331.2	383.4	435.6	487.8	540.0
		100	87.1	151.9	216.6	281.4	346.2	410.9	475.7	540.5	605.2	570.0
10"	9.88"	70	109.2	190.4	271.6	352.8	434.0	515.2	596.4	677.6	758.8	840.0
		100	135.2	235.7	336.3	436.8	537.3	637.9	738.4	838.9	939.5	1040.0
12"	11.65"	70	136.5	238.0	339.5	441.0	542.5	644.0	745.5	847.0	948.5	1050.0
		100	188.5	328.7	458.8	609.0	749.2	889.3	1029.5	1169.7	1309.8	1450.0
14"	13.60"	100	195.0	340.0	485.0	630.0	775.0	920	1065.0	1210.0	1355.0	1500.0
		130	257.4	448.8	640.2	831.6	1023.0	1214.4	1405.8	1597.2	1788.6	1980.0
16"	15.60"	100	266.5	464.7	662.8	861.0	1059.2	1257.3	1455.5	1653.7	1851.8	2050.0
		130	338.0	589.3	840.7	1092.0	1343.3	1594.7	1846.0	2097.3	2348.7	2600.0

Equal Percentage _ Standard Type

Percent of Travel			10	20	30	40	50	60	70	80	90	100
FL			0.94	0.94	0.94	0.94	0.94	0.94	0.93	0.92	0.92	0.90
Valve Size	Orifice Dia	Travel(mm)	Rated Cv									
1-1/2"	1.58"	20/30	1.64	2.30	3.24	4.55	6.39	8.98	12.62	17.73	24.91	35.0
2"	1.97"	30	2.20	3.09	4.35	6.11	8.58	12.06	16.94	23.81	33.45	47.0
2-1/2"	2.50"	30/40	3.28	4.61	6.47	9.09	12.78	17.96	25.23	35.45	49.82	70.0
3"	2.00"	30/40	3.33	4.67	6.56	9.23	12.96	18.21	25.93	35.96	50.53	71.0
	3.15"		4.92	6.91	9.71	13.64	19.17	26.94	37.85	53.18	74.73	105.0
4"	3.15"	40/50	5.15	7.24	10.17	14.29	20.08	28.22	39.65	55.71	78.28	110.0
	3.94"		8.90	12.50	17.57	24.69	34.69	48.74	68.49	96.23	135.22	190.0
6"	3.94"	40/50	9.2	12.9	18.1	25.5	35.8	50.3	70.7	99.3	139.5	196.0
	5.98"	50/70	18.7	26.3	37.0	52.0	70.6	102.6	144.2	202.6	284.7	400.0
8"	7.80"	70	24.4	34.2	48.1	67.6	94.9	133.4	187.4	263.4	370.1	520.0
		100	30.4	42.8	60.1	84.5	118.7	166.8	234.3	329.2	462.6	650.0
10"	9.88"	70	39.3	55.3	77.7	109.1	153.4	215.5	302.8	425.5	597.8	840.0
		100	48.7	68.4	96.2	135.1	189.9	266.8	374.9	526.8	740.2	1040.0
12"	11.65"	70	47.8	67.1	94.3	132.5	186.2	261.7	367.7	516.6	725.9	1020.0
		100	66.5	93.5	131.3	184.5	259.3	364.3	511.9	719.2	1010.6	1420.0
14"	13.60"	100	67.9	95.4	134.1	188.4	264.7	372.0	522.7	734.4	1031.9	1450.0
		130	92.7	130.3	183.1	257.3	361.5	507.9	713.7	1002.9	1409.1	1980.0
16"	15.60"	100	89.0	125.0	175.7	246.9	346.9	487.4	684.9	962.3	1352.2	1900.0
		130	118.0	165.8	233.0	327.4	460.1	646.5	908.4	1276.4	1793.4	2520.0

8000 Series Cv, FL Travel Chart

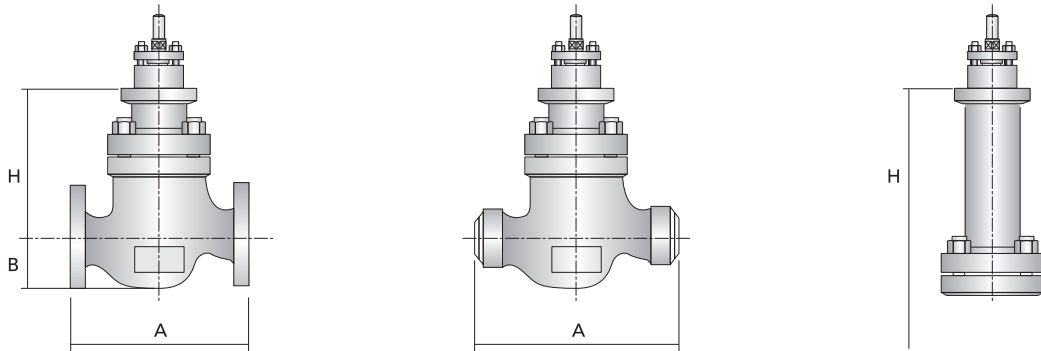
Linear _ Multi Hole Type(1-Stage)

Percent of Travel			10	20	30	40	50	60	70	80	90	100
FL			0.94	0.94	0.93	0.93	0.92	0.92	0.91	0.91	0.90	0.90
Valve Size	Orifice Dia	Travel(mm)	Rated Cv									
1-1/2"	1.58"	20/30	2.70	5.74	8.77	11.80	14.83	17.87	20.90	23.93	26.97	30.0
2"	1.97"	30	3.60	7.65	11.69	15.74	19.78	23.82	27.87	31.91	35.96	40.0
2-1/2"	2.50"	30/40	6.12	13.00	19.87	26.75	33.62	40.50	43.37	54.25	61.12	68.0
3"	2.00"	30/40	8.11	17.21	26.30	35.40	44.50	53.60	62.70	71.80	80.90	90.0
	3.15"		9.01	19.12	29.23	39.34	49.45	59.56	69.67	79.78	89.89	100.0
4"	3.15"	40/50	11.71	24.85	38.00	51.14	64.28	77.43	90.57	103.71	116.86	130.0
	3.94"		13.51	28.68	43.84	59.01	74.17	89.34	104.50	119.67	134.83	150.0
6"	3.94"	40/50	22.5	47.8	73.1	98.3	123.6	148.9	174.2	199.4	224.7	250.0
	5.98"	50/70	27.9	59.3	90.6	121.9	153.3	184.6	216.0	247.3	278.7	310.0
8"	7.80"	70	38.7	82.2	125.7	169.2	212.6	256.1	299.6	343.1	386.5	430.0
		100	46.8	99.4	152.0	204.6	257.1	309.7	362.3	414.9	467.4	520.0
10"	9.88"	70	49.5	105.1	160.7	216.4	271.5	327.6	383.2	438.8	494.4	550.0
		100	66.6	141.5	216.3	291.1	365.9	440.7	515.5	590.4	665.2	740.0
12"	11.65"	70	85.6	181.6	277.7	373.7	469.8	565.8	661.9	757.9	853.6	950.0
		100	106.3	225.6	344.9	464.2	583.5	702.8	822.1	941.4	1060.7	1180.0
14"	13.60"	100	99.1	210.3	321.5	432.7	543.9	655.1	766.4	877.6	988.8	1100.0
		130	126.1	267.6	409.2	550.7	692.3	833.8	975.4	1116.9	1258.5	1400.0
16"	15.60"	100	153.1	325.0	496.9	668.7	840.6	1012.5	1184.4	1356.3	1528.3	1700.0
		130	178.3	378.5	578.7	778.9	979.1	1179.3	1379.4	1579.6	1779.8	1980.0

Equal Percentage _ Multi Hole Type(1-Stage)

Percent of Travel			10	20	30	40	50	60	70	80	90	100
FL			0.94	0.94	0.93	0.93	0.92	0.92	0.91	0.91	0.90	0.90
Valve Size	Orifice Dia	Travel(mm)	Rated Cv									
1-1/2"	1.58"	20/30	1.22	1.71	2.40	4.63	8.19	11.75	15.32	18.88	22.44	26.0
2"	1.97"	30	1.78	2.50	3.51	6.77	11.97	17.18	22.39	27.59	32.80	38.0
2-1/2"	2.50"	30/40	2.44	3.42	4.81	9.26	16.39	23.51	30.63	37.75	44.88	52.0
3"	2.00"	30/40	3.28	4.61	6.47	12.47	22.06	31.65	41.23	50.82	60.41	70.0
	3.15"		3.98	5.59	7.89	15.14	26.78	38.43	50.07	61.71	73.36	85.0
4"	3.15"	40/50	4.68	6.58	9.25	17.81	31.51	45.21	58.91	72.60	86.30	100.0
	3.94"		5.15	7.24	10.17	19.59	35.44	49.73	64.80	79.86	94.93	110.0
6"	3.94"	40/50	8.9	12.5	17.6	33.8	59.9	85.9	111.9	137.9	164.0	190.0
	5.98"	50/70	11.7	16.5	23.1	44.5	78.8	113.0	147.3	181.5	215.8	250.0
8"	7.80"	70	15.9	22.4	31.4	60.6	107.1	153.7	200.3	246.9	293.4	340.0
		100	21.1	29.6	41.6	80.1	141.8	203.4	265.1	326.7	388.4	450.0
10"	9.88"	70	18.7	26.3	37.0	71.2	126.0	180.8	235.6	290.4	345.2	400.0
		100	24.8	34.9	49.0	94.4	167.0	239.6	312.2	384.8	457.4	530.0
12"	11.65"	70	30.0	42.1	59.2	114.0	201.7	289.3	377.0	464.7	552.	640.0
		100	44.5	62.5	87.8	169.2	299.3	429.5	559.6	689.7	819.9	950.0
14"	13.60"	100	37.5	52.7	74.0	142.5	252.1	361.7	471.2	580.8	690.4	800.0
		130	50.6	71.7	99.9	192.4	340.3	488.2	636.2	784.1	932.1	1080.0
16"	15.60"	100	53.9	75.7	106.3	204.8	362.4	519.9	677.4	834.9	992.5	1150.0
		130	71.2	100.0	140.6	270.7	478.9	687.2	895.4	1103.6	1311.8	1520.0

7000 Series Dimensions



unit / mm

ANSI Class 150-600

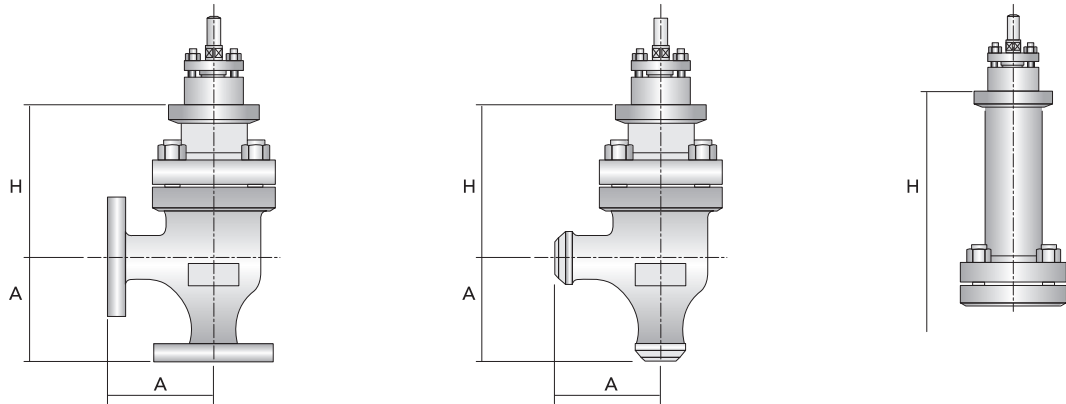
Valve Size (inch)	A						B		H			
	ANSI Class 150		ANSI Class 300		ANSI Class 600		ANSI Class 150~300	ANSI Class 600	ANSI Class 150~300		ANSI Class 600	
	RF	Welding	Rf	Welding	Rf	Welding	150~300	600	Standard Bonnet	Extension Bonnet	Standard Bonnet	Extension Bonnet
1/2"	184	206	190	206	203	206	50	50	150	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

ANSI Class 900-2500

Valve Size (inch)	A						B		H			
	ANSI Class 900		ANSI Class 1500		ANSI Class 2500		ANSI Class 900~1500	ANSI Class 2500	ANSI Class 900~1500		ANSI Class 2500	
	RF	Welding	Rf	Welding	Rf	Welding	900~1500	600	Standard Bonnet	Extension Bonnet	Standard Bonnet	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	342	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

7000 Series Dimensions



unit / mm

ANSI Class 150-600

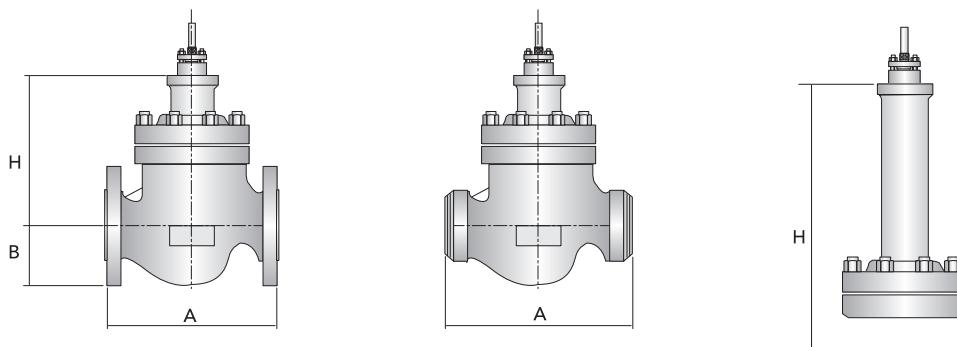
Valve Size (inch)	A						H			
	ANSI Class150		ANSI Class 300		ANSI Class 600		ANSI Class 150~300		ANSI Class 600	
	RF	Welding	Rf	Welding	Rf	Welding	Extension Bonnet	Extension Bonnet	Extension Bonnet	Extension Bonnet
3/4"	98	98	98	98	105	210	155	270	170	296
1"	98	98	98	98	105	210	155	270	170	296
1.5"	126	126	126	126	126	251	190	315	206	350
2"	132	132	132	132	143	143	230	370	270	402
2.5"	146	146	146	146	156	156	276	380	295	430
3"	159	159	159	159	169	169	280	390	320	454
4"	184	184	184	184	197	197	320	440	346	488
6"	238	238	238	238	254	254	385	451	398	520

unit / mm

ANSI Class 900-2500

Valve Size (inch)	A						H			
	ANSI Class150		ANSI Class 300		ANSI Class 600		ANSI Class 150~300		ANSI Class 600	
	RF	Welding	Rf	Welding	Rf	Welding	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

8000 Series Dimensions



unit / mm

ANSI Class 150-600

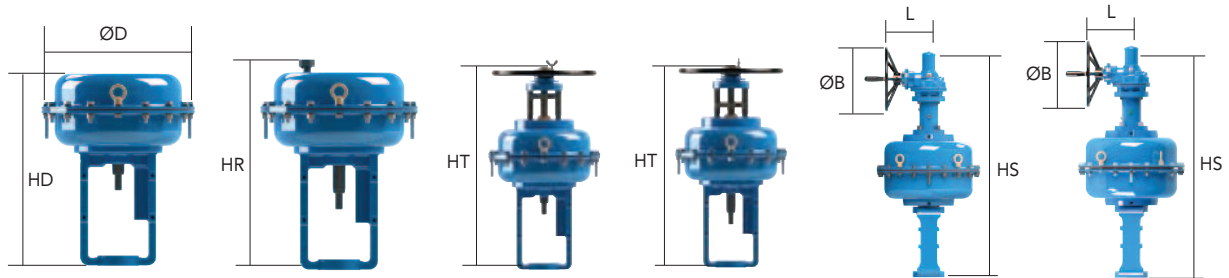
Valve Size (inch)	A						B		H			
	ANSI Class 150		ANSI Class 300		ANSI Class 600		ANSI Class 150-300	ANSI Class 600	ANSI Class 150-300		ANSI Class 600	
	RF	Welding	Rf	Welding	Rf	Welding	150-300	600	Standard Bonnet	Extension Bonnet	Standard Bonnet	Extension Bonnet
1/2"	222	251	235	251	251	251	62	72	72	315	206	350
2"	254	286	267	286	286	286	75	80	80	370	270	402
2.5"	279	292	292	292	311	311	90	100	100	380	295	430
3"	298	318	318	318	337	337	110	120	120	390	320	454
4"	352	368	368	368	394	384	110	140	140	440	346	488
6"	451	473	473	473	508	508	170	182	182	451	398	520
8"	543	568	568	568	610	610	203	215	215	750	495	780
10"	673	708	708	708	752	752	230	260	260	810	565	860
12"	737	775	775	775	819	819	280	300	300	850	700	950
14"	889	927	927	927	972	972	315	345	345	-	745	-
16"	1016	1057	1057	1057	1108	1108	340	370	370	-	790	-

unit / mm

ANSI Class 900-2500

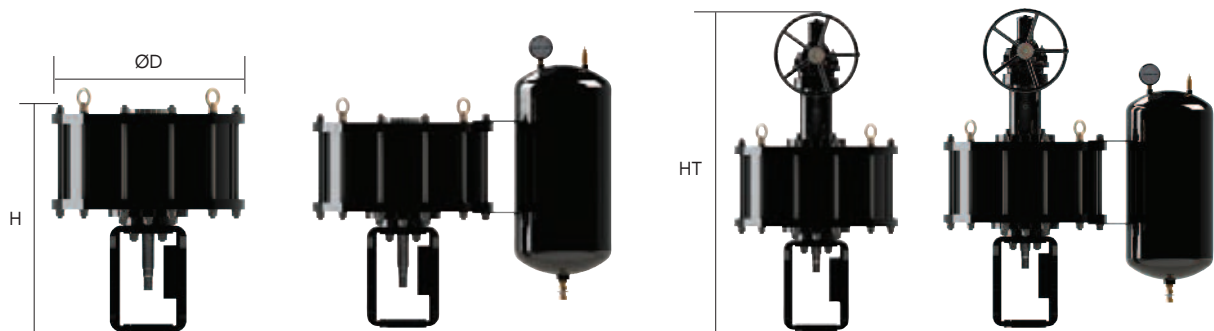
Valve Size (inch)	A						B		H			
	ANSI Class 900		ANSI Class 1500		ANSI Class 2500		ANSI Class 900-1500	ANSI Class 2500	ANSI Class 900-1500		ANSI Class 2500	
	RF	Welding	Rf	Welding	Rf	Welding	900-1500	2500	Standard Bonnet	Extension Bonnet	Standard Bonnet	Extension Bonnet
1/2"	333	330	330	330	381	381	80	100	268	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
8"	972	972	972	972	1022	1029	265	298	540	780	640	-
10"	991	991	991	991	1270	1270	310	350	590	860	690	-
12"	1130	1130	1130	1130	1321	1321	368	-	650	-	-	-

Actuator Dimensions



Valve Actuator for Diaphragm

Actuator Size	D	Without Handwheel		Side Handwheel				L	B
		DA	RA	DA	RA	DA	RA		
		HD	HR	HT	HT	HS	HS		
250	250	330	360	475	475				
290	290	370	400	535	535				
370	370	410	440	570	570				
370L	370	460	490	655	655				
480	480	630	370			1080	1080	265	
550	550	705	745			1120	1120	265	



Valve Actuator for Cylinder

Actuator Size	D	Without Handwheel			With Handwheel	A	B
		H	Min.Stroke	Max.Stroke	HT		
12	370	645		100	1080		
16	472	665		120	1100		
20	578	685		120	1120		

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