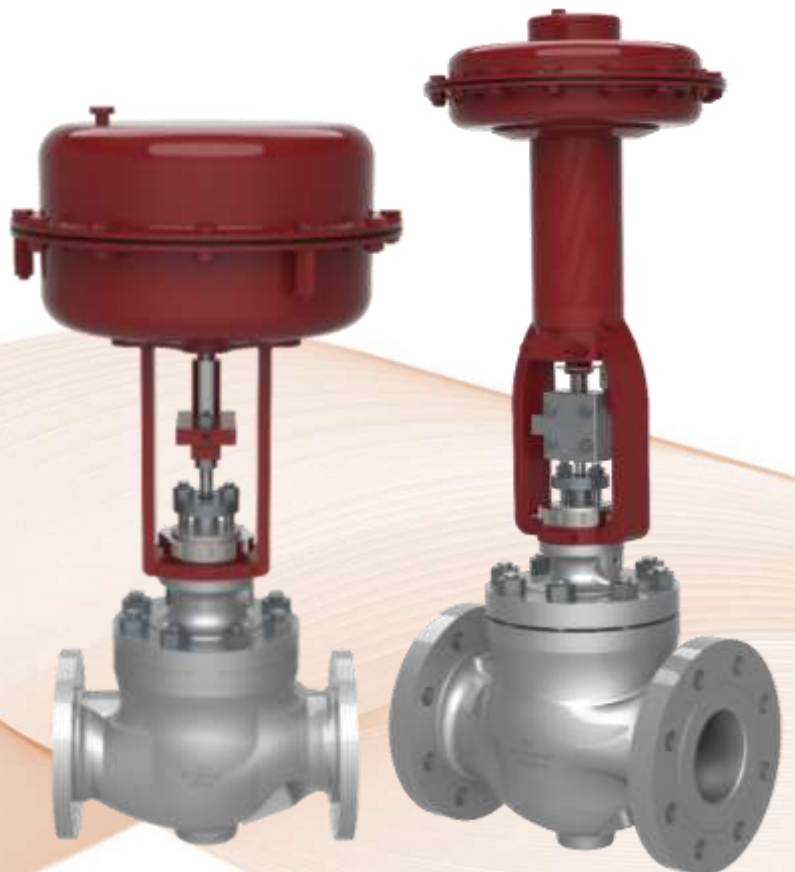




Rooted in Creative Innovation

# Globe Control Valve

## Series 10



## Foreword

Globe Control Valves are versatile go to product for flow control applications and it offers precise flow regulation, apart from offering solutions for high pressure drop, cavitation, noise and flashing. Variety of Trim options and Characteristics is unique to Globe control valves. With optional bonnets, seals and trim combination Globe valves can be used for wide range of temperatures.

FCC offer standard as well as bespoke products.

CFD reports and flow testing may be offered when requested by customers.

## Valve Model Numbering

Series	Rating	Trim Type	Temperature
10	1 - 150	10 – Contour unbalanced	1 - Warm Service
	2 - 300	20 – Micro Spline	2 - High Temperature
	3 - 600	30 – Cage, Unbalanced*	3 - Ultra High Temperature
		40 – Cage, Balanced*	4 - Cryogenic
		50 – Stack Trims	
		X1 – Tungsten carbide Trims	
		X2 – Ceramic Trims	

\*Ported Cage ,MHC, Anti-cavitation and Low Noise Trims

## Engineering Data

Table 1.1 Engineering Data

Body Style	Globe Straight, Globe Angle
Design Standard	ASME B16.34
Sizes, Pressure rating	1" to 24", ASME Class 150-600
Trim Type	Micro Spline Contoured Multi Hole Cage (MHC) Anti Cavitation Trim Low Noise Trim Stack Trims
Trim Characteristics	Equal Percentage Linear
Flow Co-efficient	Refer Table 6.1 to 6.5, Consult factory for customized Cv / Trim Characteristics.
Guiding	Top Guided Cage Guided
Seat Leakage	As per ANSI / FCI 70.2 / IEC 60534-4 Standard: Class IV Optional: Class V & VI
Flow Direction	Unbalanced Trims: Flow Under Contoured, Microspline, MHC  Balanced Trims: Ported cage :Flow Over MHC: Flow Over is standard; Flow Under when used for low noise service  Anti-cavitation trim: Flow Over Low noise trim: Flow Under
Bonnet Design	Standard (-29° to 232°C), Extension (-46° to 427°C) Cryogenic (-46°C to -196°C)
NACE Conformance	NACE conformance shall be offered for Body, Bonnet & Bolting material when requested
Trim Balancing	Unbalanced 1" to 4" Balanced 1" to 24"
End Connection Styles	Standard Flanged RF as per ASME B16.5  Optional Flanged RTJ as per ASME B16.5, Socket Welding as per ASME B16.11 (0.5" to 2"), Butt welding ends as per ASME B 16.25
Face To Face	Globe Straight: ISA 75.08.01 (Up to 16") & FCC standard (above 16") Globe Angle: ISA 75.08.08 (Up to 8") For RTJ the "X" factor from B16.10 should be added with ISA

## Parts List



Fig 1: Globe Valve

## Soft Seat and Balance Seal

### Soft Seat

Soft Seat is recommended for applications where tight shut off is required with minimal actuator force for temperature less than 232°C.

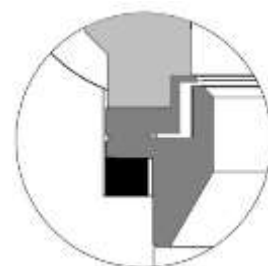


Fig 2: Soft Seal

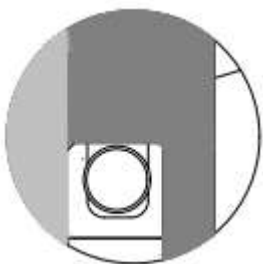


Fig 3: Balance Seal

### Balance Seal

A balance seal is used to arrest the leakage through the clearance between plug and cage.

## Trim Designs

### Micro Spline

Micro splined trims are suitable for very low Cv applications that require precise control. The plug and seat are manufactured as a matched pair. Flow under is preferred.

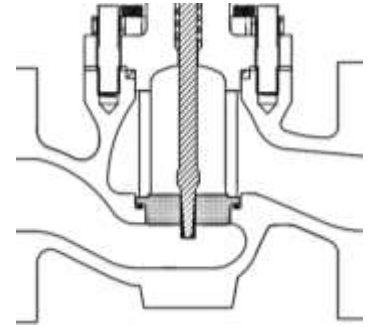


Fig 4: Micro spline

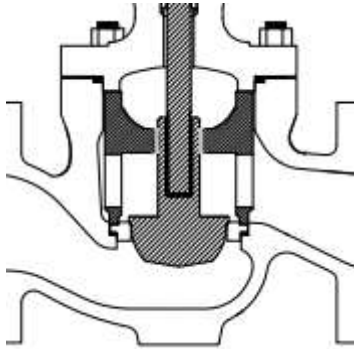


Fig 5: Contoured

### Contoured

Contoured plug with post guiding enables perfect alignment of the trim components. The trim offers wide range of Cv and characteristics. This design is suitable for viscous, dirty fluid and non-lubricating process.

### Ported Cage

Ported Cages offer massive guiding and high flow capacity even with shorter travels. These Trims are suitable for low pressure drop general service applications. Ported cages are often investment cast and are manufactured from standard stock parts.

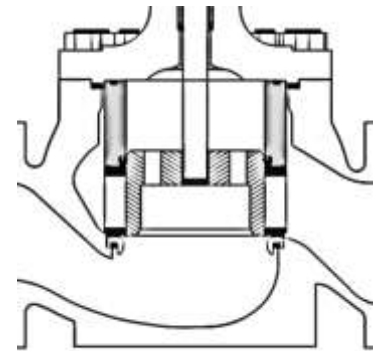


Fig 6: Ported Cage

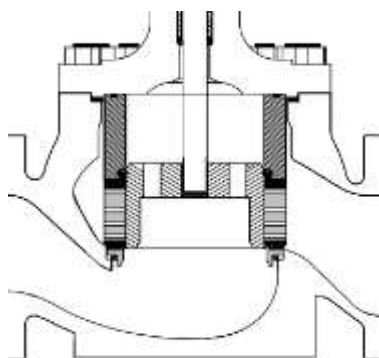


Fig 7: Multi Hole Cage

### Multi Hole Cage

Single and multiple heavy section 'drilled hole' cage design offers low pressure recovery that reduce the potential for excessive noise, cavitation, vibration and erosion. The MHC trim range has been designed to operate on all fluid combinations, both clean and dirty service.

The MHC range of trims are preferred choice for medium to relatively high pressure drop applications. Also, MHC trims are easily available in various special material combinations.

## Bonnet Designs

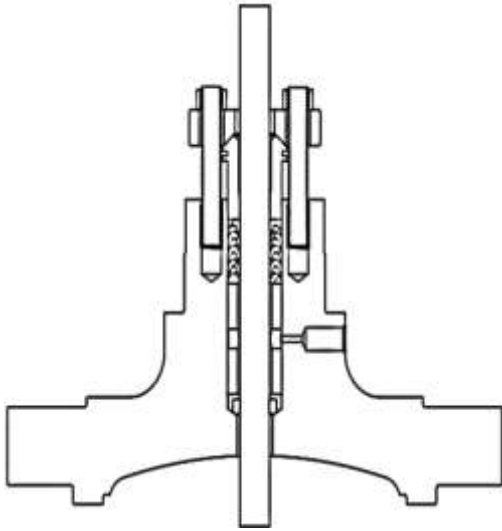


Fig 8:  
Standard Bonnet

### Standard Bonnet

Standard bonnets with graphite packing may be used for higher temperature. The packing box is suitable for both single, double packing and with or without tapping for leak-off connection.

### Extension Bonnet

Its construction protects the packing from high temperature. It accommodates all types of packing boxes that is required to meet stringent emission levels.

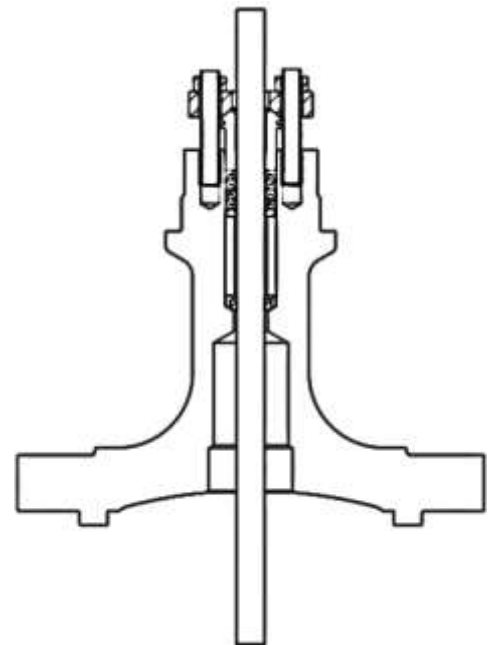


Fig 9:  
Extension Bonnet

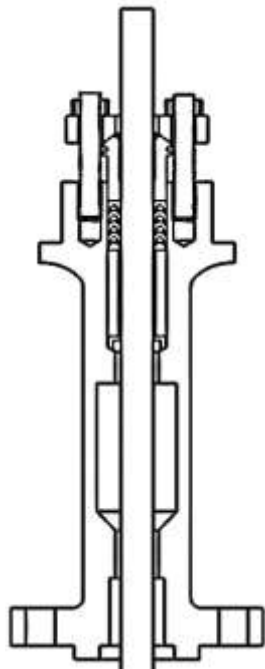


Fig 10:  
Cryogenic Bonnet

### Cryogenic Bonnet

The length of the extension is sufficient to maintain the stem packing at temperature that is within normal operating conditions of the packing.

## Packing Box

### Single PTFE

Single PTFE arrangement uses a positioning springs, this packing arrangement offers very good seal performance with lowest packing friction. This packing set consists of box ring, positioning spring, anti-extrusion rings & set of V-rings.

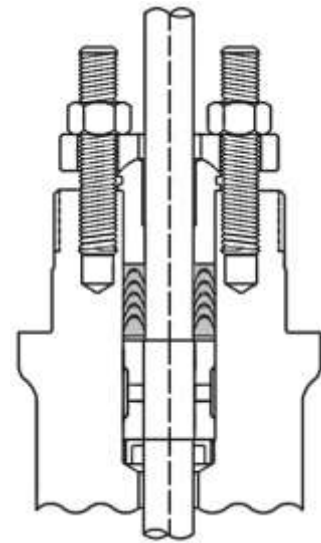


Fig 11: Single PTFE

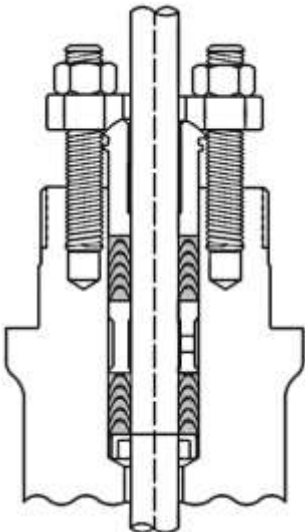


Fig 12: Double PTFE

### Double PTFE

Double PTFE arrangement has similar with single PTFE arrangement .This consists of two packing sets this gives better performance for controlling leakage.

### Graphite

Graphite packing system operate at higher stress levels and have higher friction values for a given level of sealing. It will be withstand with high temperature and pressure.

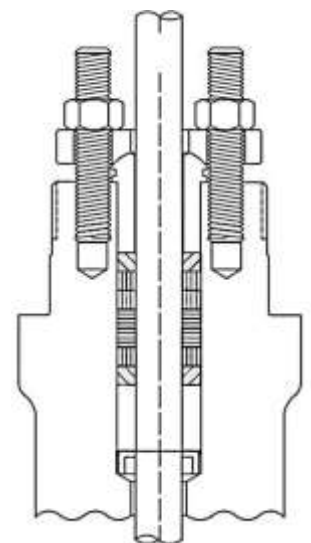


Fig 13: Graphite

## Material Specifications and Temperature for Body and Bonnet

Table 4.1 Material and Temperature for body & bonnet, Stud & Nut

Body, Bonnet Materials	Bonnet Type	NACE MR0175/0103	Stud, Nut Material	Body, Bonnet Gasket	Temperature Limits (°C)	
					Min.	Max.
WCB / WCC	Standard	NA	B7 / 2H	316L spiral wound	-29	232
	Extension				-29	427
	Standard	Yes	B7M / 2HM		-29	232
	Extension				-29	427
LCB / LCC	Standard	NA	L7 / 7L	316L spiral wound	-29	232
	Extension				-46	232
	Extension				-46	343
	Standard	Yes	L7M / 7ML		-29	232
	Extension				-46	232
	Extension				-46	343
WC6, WC9	Standard	NA	B7 / 2H	316L spiral wound	-29	232
	Extension				-29	427
CF8M, CF3M	Standard	NA	B7 / 2H, B8M / 8M	316L spiral wound	-29	232
	Extension		B7 / 2H, B8M / 8M		-46	232
	Extension		B7 / 2H, B8M / 8M		-46	427
	Standard	Yes	B7M / 2HM, B8M / 8MA		-29	232
	Extension		B7M / 2HM, B8M / 8MA		-46	232
	Extension		B7M / 2HM, B8M / 8MA		-46	427
Duplex 4A Sup.duplex 6A	Standard	NA	L7 / 7L, B8M / 8M	32760 spiral wound	-29	232
	Extension		L7 / 7L, B8M / 8M		-46	232
	Extension		L7 / 7L, B8M / 8M		-46	316
	Standard	Yes	S32760		-29	232
	Extension		S32760		-46	232
	Extension		S32760		-46	316
	Standard	Yes	B8M / 8MA		-29	232
	Extension		B8M / 8MA		-46	232
	Extension		B8M / 8MA		-46	316
Monel, Inconel, HTB1, Al. Bronze	Standard	Yes	B7M / 2HM, B8M / 8MA	Inconel spiral wound	-198	482
	Standard		B7M / 2HM, B8M / 8MA		-198	232

### Notes

1. All alloy steel bolting (B7, L7, B16) are supplied with phosphating as standard.
2. Zinc plating option available on request and its temperature is limited to 200°C.
3. Forged construction and other custom material options available on request.



## Material and Temperature Limits for Trim Parts

Table 5.1 Material and Temperature Limits for Trim

Trim Type	Trim No	Stem	Plug	Seat	Cage	Seat Clamp	Temp	
							Min.	Max.
Contoured	1	17-4PH	316	316	-	316 CoCr-A Guide	-29	149
	2	17-4PH	316 CoCr-A SA	316 CoCr-A	-	316 CoCr-A Guide	-29	316
	3	17-4PH	316 CoCr-A FC	316 CoCr-A	-	316 CoCr-A Guide	-46	316
Cage guided	4	17-4PH	316	316	17-4PH	-	-29	210
	5	17-4PH	316 CoCr-A SA	316 CoCr-A	17-4PH	-	-29	210
	6	17-4PH	316	316	316 ENC	-	-198	316
	7	17-4PH	316 CoCr-A FC	316 CoCr-A	316	-	-198	316

Note: For other materials consult factory

Table 5.2

Item	Standard	Optional
Seat	Metal	PTFE, Kel-F
Balance seals	Spring energized PTFE lip seal (-196°C to 232°C)	Graphite Piston rings (232°C to 427°C)
Packing	PTFE Chevrons	Graphite Packing High integrity packing
Gaskets	316L spiral wound with graphite filler	32760 spiral wound with graphite filler Inconel spiral wound with graphite filler

## Flow Coefficients

Table 6.1 Micro Spline Trim

Valve Size	Seat Bore	Travel	Flow Direction	Cv, Eq %
½" to 2"	1/4	3/4	Under	1.08
½" to 2"	1/4	3/4	Under	0.351
½" to 2"	3/16	3/4	Under	0.177
½" to 2"	3/16	3/4	Under	0.073

Table 6.2 Contoured Trim

Valve Size	Seat Bore	Travel	Flow Direction	Cv, Eq %	Cv, Lin
1	1	3/4	Under	13.1	13.2
1	3/4	3/4	Under	8.79	-
1	1/2	3/4	Under	4.96	-
1	3/8	3/4	Under	3.05	-
1 1/2	1 1/2	3/4	Under	27.8	30.8
1 1/2	1	3/4	Under	16.9	16.4
1 1/2	3/4	3/4	Under	9.98	-
1 1/2	1/2	3/4	Under	5.21	-
1 1/2	3/8	3/4	Under	3.15	-
2	2	1 1/8	Under	53.6	51.8
2	1	3/4	Under	16.2	14.8
2	3/4	3/4	Under	9.98	-
2	1/2	3/4	Under	5.21	-
2	3/8	3/4	Under	3.15	-
3	3	1 1/2	Under	109	110
3	2	1 1/8	Under	71.8	81.2
4	4	2	Under	192	210
4	2	1 1/8	Under	71.9	85.2

Table 6.3 Ported / Multi Hole Cage

Valve Size	Seat Bore	Travel	Flow Direction	Ported Cage		MHC	
				Cv, Eq %	Cv, Lin	Cv, Eq %	Cv, Lin
1	1 5/16	3/4	Over	18.8	20.2	15.0	16.2
1 1/2	1 7/8	3/4	Over	36.2	39.5	29.0	31.6
1 1/2	1 5/16	3/4	Over	22.7	28.7	18.2	23.0
2	2 5/16	1 1/8	Over	61.1	71.5	48.9	57.2
2	1 5/16	3/4	Over	23.8	32.2	19.0	25.8
3	3 7/16	1 1/2	Over	137	149	110	119
3	2 5/16	1 1/8	Over	70.4	103	56.3	82.4
4	4 3/8	2	Over	225	233	180	186
4	2 7/8	1 1/2	Over	110	109	88.0	87.2
6	7	2	Over	395	428	316	342
6	4 3/8	2	Over	270	319	216	255
8	8	3	Over	816	848	653	678
8	8	2	Over	564	685	451	548
10	8	3	Over	924	971	739	777
12	11	5 1/2	Over	1375	1562	1100	1250
12	11	4	Over	-	1496	-	1197
14	11	5 1/2	Over	1391	1749	1112	1399
14	11	4	Over	-	1556	-	1245
16	14 3/4	5 1/2	Over	2657	3304	2126	2643
16	11	4	Over	1410	2768	1128	2214
16	14 3/4	8	Over	3048	-	2438	-
18	14 3/4	5 1/2	Over	2708	3352	2166	2682
18	14 3/4	4	Over	1501	2804	1201	2243
20	18 1/4	8	Over	4822	5196	3858	4157
20	14 3/4	8	Over	3364	-	2691	-
20	14 3/4	5 1/2	Over	2902	3722	2322	2978
20	14 3/4	4	Over	1508	3019	1206	2415
24	18 1/4	8	Over	5177	5837	4142	4670
24	14 3/4	8	Over	3720	-	2976	-
24	14 3/4	5 1/2	Over	3090	4266	2472	3413
24	14 3/4	4	Over	1508	3248	1206	2598

Table 6.4 Anti Cavitation Trim

Valve Size	Flow Direction	1-stage			2-stage		
		Seat Bore	Travel	Cv, Lin	Seat Bore	Travel	Cv, Lin
1	Over	1 5/16	1	15.3	1	1	5.8
1 1/2	Over	1 7/8	7/8	22.2	1 5/16	1 1/2	9.5
2	Over	2 5/16	1 1/8	35.7	1 7/8	2	20.9
3	Over	3 7/16	1 5/8	86.8	2 7/8	3	48.7
4	Over	4 3/8	2 1/8	147	2 7/8	4	69.2
4	Over	-	-	-	2 7/8	3	53.4
6	Over	7	2 1/4	255	5 3/8	4	145
8	Over	8	3 3/8	434	7	2	260
10	Over	8	3 1/2	450	-	-	-
12	Over	11	6	1061	-	-	-
14	Over	11	6	1071	-	-	-
16	Over	14 3/4	6	1437	-	-	-
18	Over	14 3/4	6	1595	-	-	-
20	Over	18 1/4	8 1/2	2795	-	-	-
24	Over	18 1/4	8 1/2	3103	-	-	-

Table 6.5 Low Noise Trim

Valve Size	Seat Bore	Travel	Flow Direction	Cv, Lin								
				1.1	1.3	2.1	2.3	3.1	3.3	4.1	4.3	
1	1 5/16	3/4	Under	15.7	-	-	-	-	-	-	-	-
1 1/2	1 7/8	3/4	Under	25.5	-	-	-	-	-	-	-	-
1 1/2	1 5/16	3/4	Under	-	21.1	15.7	11.8	-	-	-	-	-
1 1/2	3/4	1 1/8	Under	-	-	-	-	7.27	8.22	7.36	8.24	-
2	2 5/16	1 3/8	Under	49.5	-	-	-	-	-	-	-	-
2	1 5/16	1 1/4	Under	-	29.3	24.4	19.5	14.2	14.0	13.8	13.6	-
3	3 7/16	1 1/2	Under	99.1	-	-	-	-	-	-	-	-
3	2 5/16	1 1/2	Under	-	88.9	67.1	74.4	45.1	44.7	45.1	44.7	-
4	4 3/8	2	Under	156	-	-	-	-	-	-	-	-
4	3 7/16	2	Under	-	138	110	99.4	75.9	73.3	75.8	73.3	-
6	7	2	Under	285	-	-	-	-	-	-	-	-
6	5 3/8	3	Under	295	294	232	226	127	139	127	102	-
8	8	3	Under	426	-	-	-	-	-	-	-	-
8	8	4	Under	635	635	405	405	278	258	-	-	-
10	8	6	Under	885	885	576	550	392	290	-	-	-
10	7	6	Under	-	-	-	-	-	-	390	345	-
12	11	5 1/2	Under	1134	1044	717	713	493	480	-	-	-
12	11	8	Under	1313	1273	944	939	689	650	-	-	-
12	10	8	Under	-	-	-	-	-	-	-	-	588
14	11	5 1/2	Under	1313	1184	744	740	501	477	-	-	-
14	11	8	Under	1517	1461	905	1047	707	680	-	-	-
14	10	8	Under	-	-	-	-	-	-	-	-	619
16	16 1/4	8	Under	2106	2095	1692	1656	1240	1114	-	-	-
16	14 3/4	8	Under	2087	2042	1605	1548	1126	1217	-	-	1113
18	16 1/4	8	Under	2506	2386	1754	1688	1174	1134	-	-	-
18	14 3/4	8	Under	-	-	-	-	-	-	-	-	1033
18	16 1/4	14 7/8	Under	2950	2901	2181	2473	1995	1949	-	-	-
18	14 3/4	14 7/8	Under	-	-	-	-	-	-	-	-	1727
18	16 1/4	10 7/8	Under	2728	2644	2177	1829	1552	1518	-	-	-
18	14 3/4	10 7/8	Under	-	-	-	-	-	-	-	-	1361
20	19 3/4	10 7/8	Under	3753	3667	2901	2822	2077	2026	-	-	-
20	18 1/4	10 7/8	Under	-	-	-	-	-	-	-	-	1822
20	19 3/4	14 7/8	Under	3761	3758	3441	3391	2632	2577	-	-	-
20	18 1/4	14 7/8	Under	-	-	-	-	-	-	-	-	2310
24	19 3/4	10 7/8	Under	4177	3831	2699	2607	1848	1792	-	-	-
24	18 1/4	10 7/8	Under	-	-	-	-	-	-	-	-	1633
24	19 3/4	14 7/8	Under	4659	4334	3558	3482	2500	2443	-	-	-
24	18 1/4	14 7/8	Under	-	-	-	-	-	-	-	-	2206

**Note:**

The 1<sup>st</sup> Digit here indicate the distance between holes. And 2<sup>nd</sup> Digit here indicate the hole size (or) diameter.

**Dimensions & Weights**

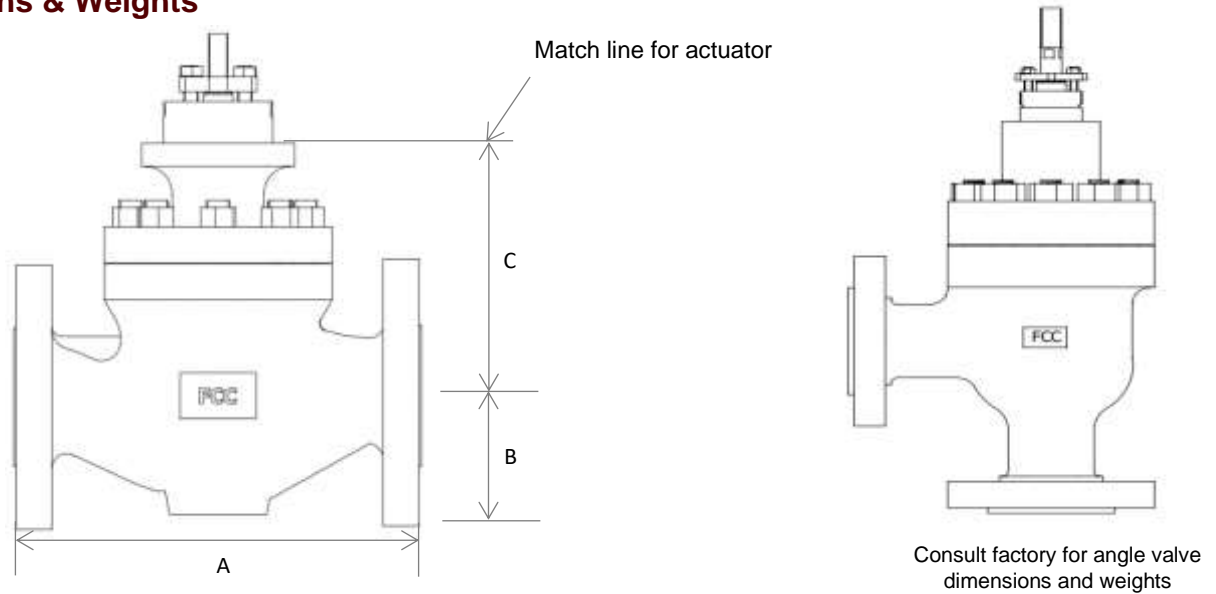


Table 7.1 Dimensions & Weights

Valve Size (inch)	Stem Dia (inch)	A (mm)			B (mm)		C <sup>(1)</sup> (mm)	Weight (kg)	
		150#	300#	600#	150-300#	600#		150-300#	600#
1	3/8	184	197	210	60		129	16	18
1	1/2	184	197	210	60		152		
1 1/2	3/8	222	235	251	71		125	22	24
1 1/2	1/2	222	235	251	71		144		
2	1/2	254	267	286	78		168	36	37
2	3/4	254	267	286	78		162		
3	1/2	298	317	337	97		195	60	62
3	3/4	298	317	337	97		192		
4	1/2	353	368	394	129		226	73	75
4	3/4	353	368	394	129		219		
6	3/4	451	473	508	162		255	155	160
6	1	451	473	508	162		268		
6 <sup>(2)</sup>	3/4	451	473	508	162		310		
6 <sup>(2)</sup>	1	451	473	508	162		375		
8	3/4	543	568	610	191		379	413	417
8	1	543	568	610	191		430		
10	3/4	673	708	752	275		379	570	749
12	1 1/4	737	775	819	338	338	592	953	1274
14	1 1/4	889	927	972	379	379	561	1129	1413
16	1 1/4	1016	1057	1108	429	437	663	1724	2312
18	1 1/4	1146	1184	1257	487	487	765	2307	2910
20	1 1/4	1267	1308	1372	514	514	917	4125	4739
24	1 1/4	1556	1600	1676	565	565	917	5510	6798

For non-standard sizes consult factory  
 Note1: Applicable only for plain bonnet  
 Note2: Only for Low noise trim



Flow Control Commune  
# 9 Multi Industrial Estate, Gerugambakkam, Chennai 600122 India. Website: [www.fccommune.com](http://www.fccommune.com)