



Globe Control Valve

Series 11



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
11	4 - 900	10 – Contour unbalanced	1 - Warm Service
	5 - 1500	20 – Micro Spline	2 - High Temperature
	6 - 2500	30 – Cage, Unbalanced*	3 - Ultra High Temperature
	X - Special	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 12", ASME Class 900-1500 1" to 8", ASME Class 2500
Trim Type	Micro Spline Contoured Multi Hole Cage (MHC) Low Noise Trim Anti-cavitation Trim Stack Trims
Trim Characteristics	Equal Percentage Linear Modified Equal Percentage
Flow Co-efficient	Refer Table 6.1 to 6.5, Consult factory for customized Cv / Trim Characteristics.
Guiding	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 Microspline, Contoured, 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 2" Balanced 1" to 12"
End Connection Styles	Standard Flanged RTJ as per ASME B16.5 Optional Butt welding ends as per ASME B 16.25, Socket Welding as per ASME B16.11 (0.5" to 2")
Face To Face	Globe Straight: ISA 75.08.06 (Up to 12") & B16.10, FCC standard for Globe Angle 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.

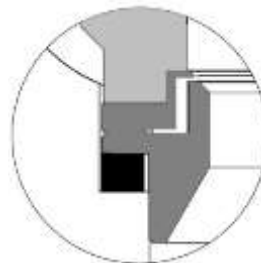


Fig 2: Soft Seal

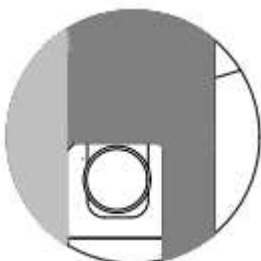


Fig 3: Balance Seal

Balance Seal

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

Trim Design

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.

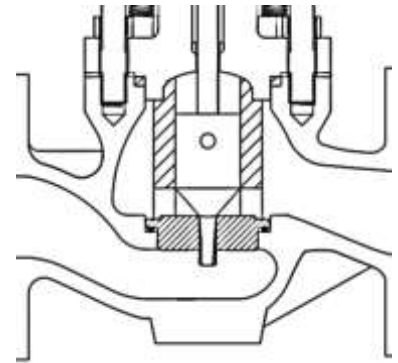


Fig 4: Microspline

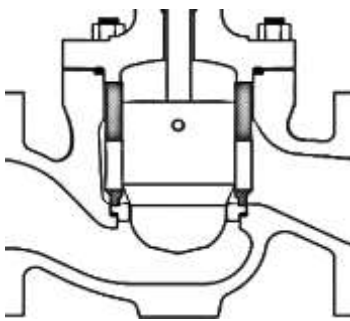


Fig 5: Contoured

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.

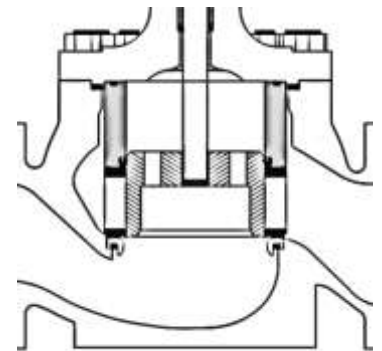


Fig 6: Ported Cage

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.

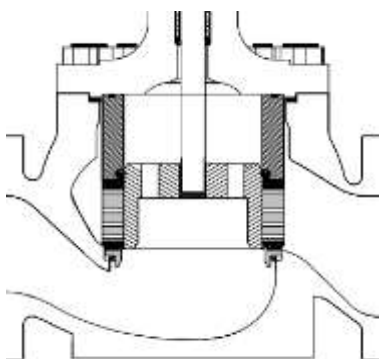


Fig 7: Multi Hole Cage

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

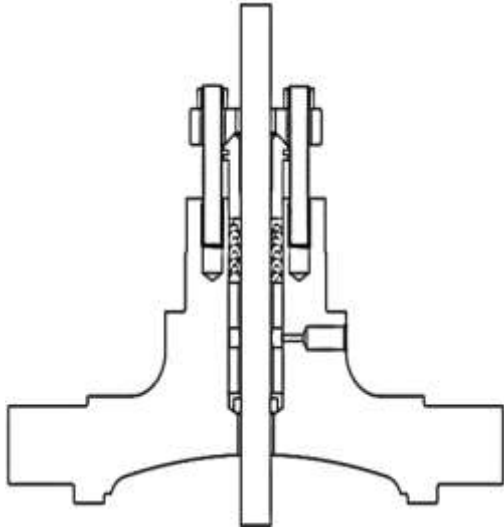


Fig 8:
Standard Bonnet

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.

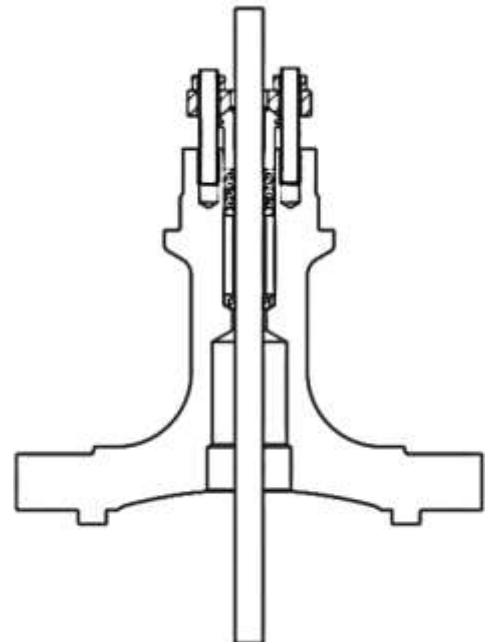


Fig 9:
Extension Bonnet

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.

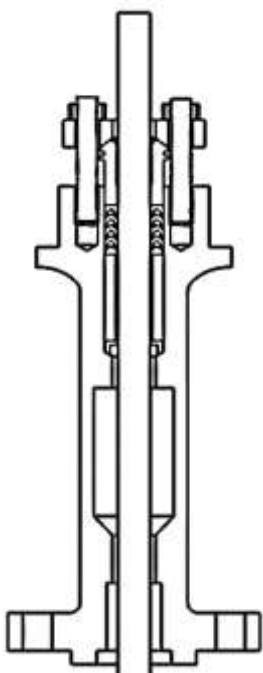


Fig 10:
Cryogenic Bonnet

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.

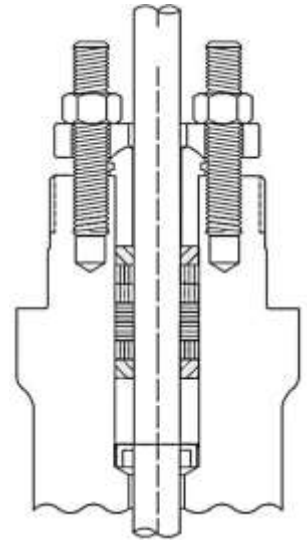


Fig 11: Single PTFE

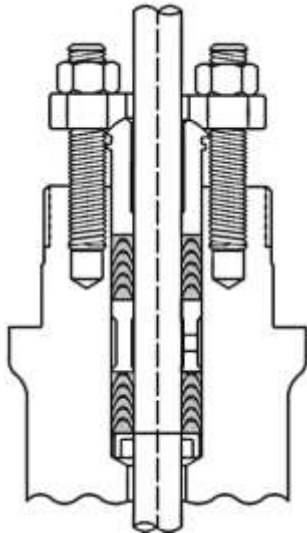


Fig 12: Double PTFE

Double PTFE

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

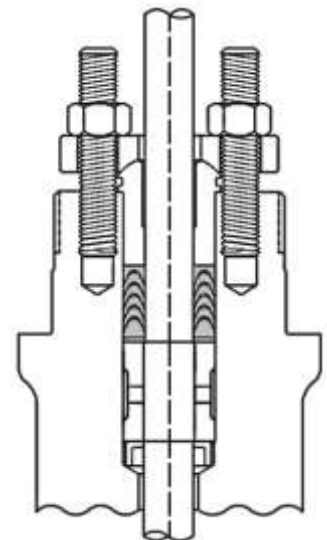


Fig 13: Graphite

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.

Material Specifications and Temperature for Body and Bonnet

Table 4.1 Material and Temperature for body & bonnet

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		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

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	Temp	
						Min.	Max.
Cage guided	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
	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
Soft Seal	PTFE	Graphite, Kel-F
Balance seals	Spring energized PTFE lip seal (-196°C to 232°C)	Graphite Piston rings (232°C to 427°C)
Packing	PTFE	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 %
1	1/2	3/4	Under	4.29
1	1/4	3/4	Under	1.03
1	1/4	3/4	Under	0.349

Table 6.2 Contoured Trim

Valve Size	Seat Bore	Travel	Flow Direction	Cv, Eq % (900 - 2500 #)	Cv, Mod. Eq % (900 - 1500 #)	Cv, Mod. Eq % (2500 #)
1	1	1 1/8	Under	-	17.5	14.1
1	3/4	3/4	Under	9.13	-	-
1	3/4	1 1/8	Under	-	12.0	12.1
1	1/2	3/4	Under	5.47	-	-
1	1/4	3/4	Under	1.24	-	-
2	1 1/2	1 1/2	Under	-	52.5	43.8
2	1 1/4	1 1/8	Under	-	33.2	33.2
2	1	1 1/8	Under	-	23.6	24.6
2	3/4	3/4	Under	11.4	-	-
2	1/2	3/4	Under	5.42	-	-
2	1/4	3/4	Under	1.54	-	-

Table 6.3 Ported

Valve Size	Seat Bore	Travel	Flow Direction	Cv, Eq %		Cv, Mod. Eq %		Cv, Lin	
				(900-1500#)	(2500#)	(900-1500#)	(2500#)	(900-1500#)	(2500#)
2	1 7/8	1 1/2	Over	-	-	48.4	-	52	-
2	1 7/8	1 1/8	Over	41.2	-	-	37.7	-	-
2	1 7/8	1	Over	-	34.8	-	-	-	38.1
3	2 7/8	2	Over	92.5	-	114	-	122	-
3	2 1/4	1 1/2	Over	-	-	-	83.7	-	87.8
4	3 5/8	2	Over	-	-	201	-	201	-
4	3 5/8	1 1/2	Over	163	-	-	-	-	-
4	2 9/10	2	Over	-	-	-	131	-	151
6	5 3/8	3	Over	-	-	377	-	422	-
6	5 3/8	2 1/2	Over	320	-	-	-	-	-
6	4 1/6	3	Over	-	-	-	311	-	322

Table 6.4 Multi Hole Cage

Valve Size	Seat Bore	Travel	Flow Direction	Cv, Eq %		Cv, Mod. Eq %		Cv, Lin	
				(900-1500#)	(2500#)	(900-1500#)	(2500#)	(900-1500#)	(2500#)
2	1 7/8	1 1/2	Over	-	-	38.72	-	41.6	-
2	1 7/8	1	Over	-	27.84	-	-	-	30.5
2	1 7/8	1 1/8	Over	33.0	-	-	30.1	-	-
3	2 7/8	2	Over	74	-	91.2	-	97.6	-
3	2 1/4	1 1/2	Over	-	-	-	67.0	-	70.2
4	3 5/8	2	Over	-	-	161	-	161	-
4	3 5/8	1 1/2	Over	130	-	-	-	-	-
4	2 9/10	2	Over	-	-	-	105	-	121
6	5 3/8	3	Over	-	-	302	-	338	-
6	5 3/8	2 1/2	Over	256	-	-	-	-	-
6	4 1/6	3	Over	-	-	-	249	-	257

Table 6.5 Anti Cavitation Trim

Valve Size	Seat Bore	Travel	Flow Direction	Cv, Lin (900 – 1500#)		Cv, Lin (2500#)	
				2 Stage	3 stage	2 Stage	3 stage
1	7/8	1.5	Over	7.41	-	7.5	-
2	1 3/4	2	Over	13.4	-	13.4	-
2	1	2	Over	-	6.13	-	6.13
3	2 1/2	2 1/2	Over	32.4	-	-	-
3	1 7/8	2 1/2	Over	-	15.7	-	-
3	2 1/4	2 1/2	Over	-	-	31.1	-
3	1 3/8	2 1/2	Over	-	-	-	12.4
4	3 7/16	3	Over	57.65	-	-	-
4	2 7/8	3	Over	-	28.2	-	-
4	2 9/10	2 3/4	Over	-	-	40.3	-
4	2 1/4	2 3/4	Over	-	-	-	22.4
6	5 1/4	4	Over	120	-	-	-
6	4 9/16	4	Over	-	64.1	-	-
6	4 1/6	3 3/4	Over	-	-	83.9	50.7

Table 6.6 Low Noise Trim

Valve Size	Seat Bore	Travel	Flow Direction	Cv Linear (900 & 1500#)						
				1.1	1.3	2.1	2.3	3.1	3.3	4.3
2	1 7/8	1 1/2	Under	42.1	-	-	-	-	-	-
2	1 7/8	1 1/2	Under	40.9	-	-	-	-	-	-
3	2 7/8	2	Under	107	-	47.9	-	-	-	-
3	2 7/8	2	Under	110	-	44.4	-	-	-	-
4	3 5/8	2	Under	162	-	-	86.8	-	55.9	-
4	2 7/8	2	Under	-	-	-	-	-	-	37.1
4	3 3/5	2	Under	134	131	101	105	72.8	72.8	-
6	5 3/8	3	Under	322	-	-	162	-	108	-
6	4 3/8	3	Under	-	-	-	-	-	-	69.6
6	5 2/5	3	Under	263	271	216	237	162	162	-

Table 6.7 Low Noise Trim

Valve Size	Seat Bore	Travel	Flow Direction	Cv Linear (2500 #)						
				1.1	1.3	2.1	2.3	3.1	3.3	4.3
2	1 7/8	1 1/2	Under	35.2	-	-	-	-	-	-
3	2 1/4	1 1/2	Under	65.3	69.6	39.8	48.7	37.2	37.2	-
3	1 3/8	2	Under	-	-	-	-	-	-	26.1
4	2 9/10	2	Under	121	123	80.3	81.2	53.7	53.6	-
4	2 1/4	2	Under	-	-	-	-	-	-	40.3
6	4 1/6	3	Under	262.23	254	172	177.24	106.21	115.7	115.7

Note:

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

Dimensions & Weights

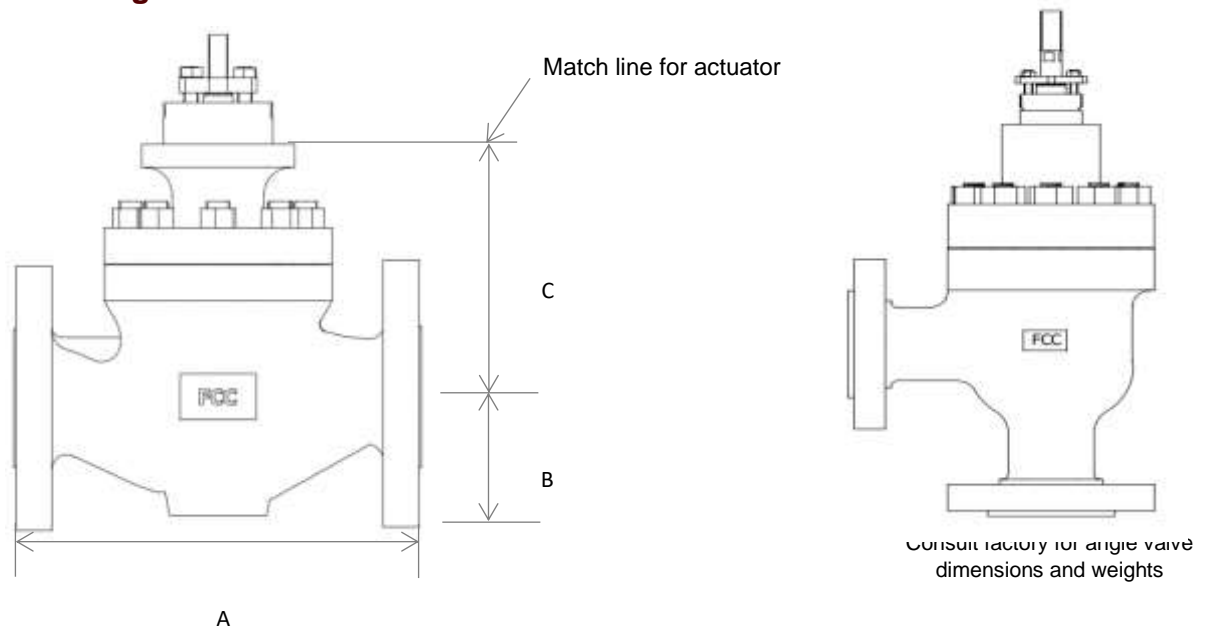


Table 7.1 Dimensions & Weights

Valve Size (inch)	Stem Dia (inch)	A (mm)			B (mm)		C (mm) Std Bonnet	Weight (kg)		
		900#	1500#	2500#	900-1500#	2500#		900#	1500#	2500#
1	1/2	292	292	318	52	63	260	42	42	45
1	3/4	292	292	318	52	63	267	42	42	45
2	1/2	378	378	416	77	84	279	72	72	104
2	3/4	378	378	416	77	84	286	72	72	104
2	1	378	378	416	77	84	344	72	72	104
3	1/2	445	464	667	121	120.4	322	125	129	228
3	3/4	445	464	667	121	120.4	311	125	129	228
3	1	445	464	667	121	120.4	370	125	129	228
4	3/4	514	533	747	175	136.8	300	230	249	480
4	1	514	533	747	175	136.8	368	230	249	480
6	3/4	718	775	877	248	204.7	365	511	557	1080
6	1	718	775	877	248	204.7	402	511	557	1080

Note

1. For non-standard sizes consult factory
2. Face to Face given is for RTJ Flange



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