Single Seated Globe Control Valves

Series 10

RK CONTROL INSTRUMENTS

Mastering Flow Since 1969

An ISO 9001 Certified Company

SERIES 10 - FEATURES

Performance:

- High flow capacity.
- Tight shut-off.
- High rangeability.
- Cast globe type body with streamline inlet and outlet flow passages. Body proportioned to withstand high pipe stresses without distortion.

Design Flexibility:

- All internal parts can be dismantled through the top of the body and can be installed without disturbing the valve body from the line. Removal of bonnet also enables internal parts to be inspected without removing valve from the line. Wide range of interchangeable trim sizes.

Heavy Duty Parts:

- No bottom guide obstructing seat bore and trapping debris.
- Seat ring is generously proportioned and screwed into body to ensure a leakproof joint. A clamped seat and seal welded seats available as an alternative.
- Deep all purpose packing box accommodating a variety of proprietary packings with an option of live loading feature.
- Large diameter stems.

Quality Manufacturing:

- Full range of body and trim materials available.
- Comprehensively tested to ensure specified performance on site.
- Maintenance of material and inspection records throughout manufacture.

Control Valve
Cross Sectional View
Series 10

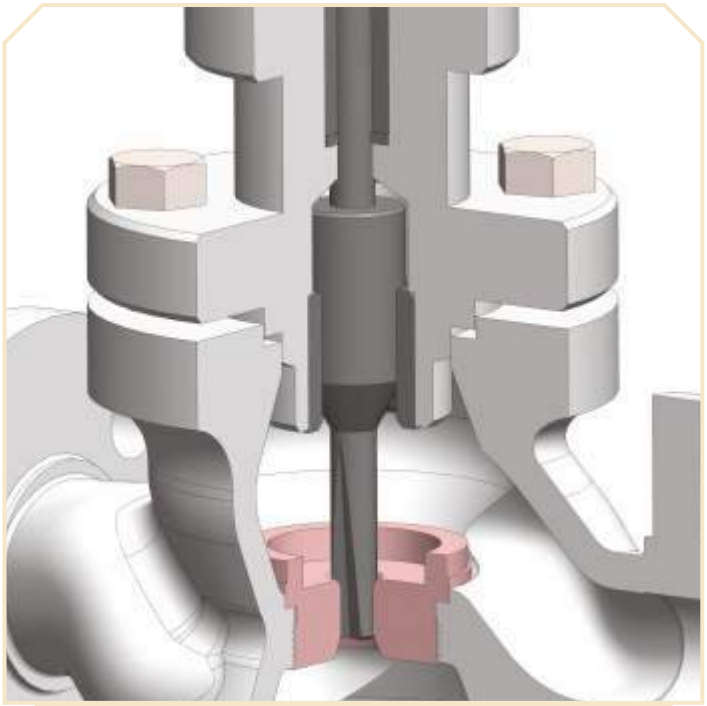
General:

The ‘Series 10’ valve in its basic form satisfies majority of general applications to be found throughout the process and power industries. The construction of this range of valves is of a simple form but it has a design which itself allows many standard specialised applications.

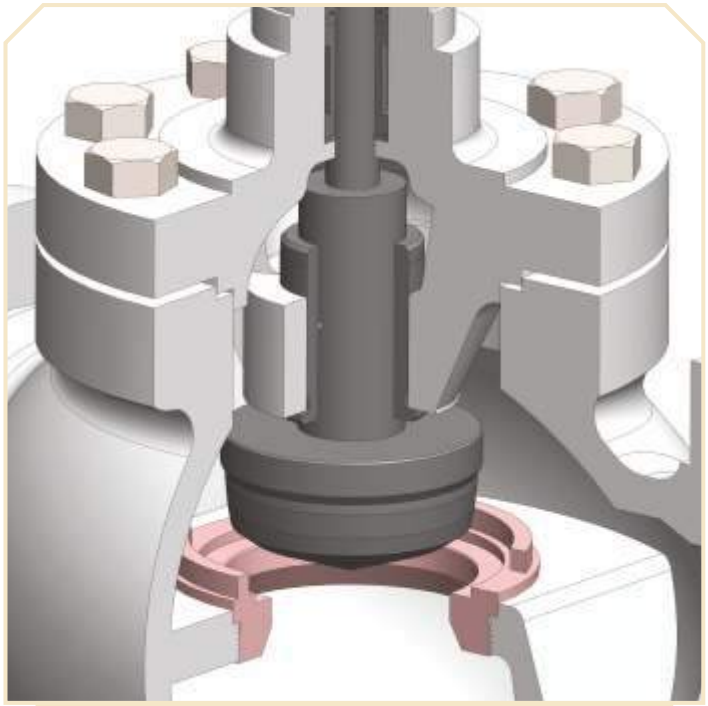
Series 10 : Engineering Specifications

Valve Sizes	½" to 24" *(15-600mm)*. Higher Sizes on request
Body Rating	ASME Class 150 to ASME Class 2500 DIN EN1092-1, PN2.5 to PN420 Other requirements available on request
End Connection Styles	Raised Face *(RF)*, Flat Face *(FF)*, Ring type Joint *(RTJ)*, Tongue and Groove *(T & G)* Butt Weld *(BW)*, Socket Weld *(SW)*, Screwed. Other Requirements available on request
Applicable Standards	Design standard ASME B 16.34 Screwed or Socket Weld as Per ASME B 16.11 Butt Weld as per ASME B 16.25 Face to face ISA S75.08/ratings as per ASME B 16.34 Flanges as per ASME B 16.5 Other standards on request
Seat Leakage Classification	As Per ANSI / FCI 70-2 Standard: *(Class IV, Class V)* - Metal to Metal, (Class VI) - Soft Seated
Construction Materials Body and Bonnet	WCB, WCC, WC6, WC9, LCB, LCC, CF8, CF8M, CF3 / CF3M, Alloy 20, Hastelloy, Monel, Duplex SS, C5, Inconel and other materials on request
Bonnet Options	Standard, Normalising *(Extended Bonnet/Finned)*, Bellow Seal and Cryogenic Bonnets
Trim Materials	SS 304, SS 304L, SS 316, SS 316L / Stellited, 17-4 PH, Duplex SS, SS 416, SS 410, Alloy 20, Hastelloy, Inconel, Monel and others on request
Inherent Characteristics	Equal Percentage / Linear / Quick Opening / Mod. Equal percentage
Standard Duty	The Contoured and Ported Cage Design are the Standard Trim Options used for Modulating or On / Off applications
Severe Service Applications	Globe Control Valves find applications for the most Severe Applications that encounter Flashing and Cavitation. RK Control use the HF *(High Friction)* Family of Cage Guided Trims to prevent onset of Cavitation in liquid services and attenuate noise in Gas / Vapour Applications. HF: Single Cage Guided Trim HFD: Double Cage Guided Trim HFT: Triple Cage Guided Trim HFMM : Multistage Multi Path Trim
Other Trim Design Options	Microspline Trims Used for low flow applications, Special Cv can be Engineered
Optional Noise Abating Devices	Baffle plates, Seat Exit Diffusers
Special Valves Options	Jacketed Valves, Bellow Sealed Valves *(Metallic/PTFE)* and RBH *(Removable Blind Head)*
Plug Options	
Solid Plug *(Unbalanced)*	With Metal to Metal seating or Resilient (PTFE) Seating face
Balanced Plug	With resilient ring *(upto 180°C)* / Graphite ring *(upto 400°C)* / C Seal Trim: *(Upto 550°C)*
Auxiliary Shut Off Pilot Plug Design	Used to achieve Class V Shut Off at high pressure & elevated temperatures
Actuation	Field reversible Spring and Diaphragm Actuators, Piston Actuators, Multi spring *(Compact Actuators)* and Electrical Actuators, Electrohydraulic Actuators
Accessories	Pneumatic Positioners, Electropneumatic Positioners, Smart Positioners with HART, Foundation Fieldbus and Profibus Protocols can be offered. Various other options of accessories can be supplied like Air Filter Regulators, Solenoid Valves, Limit Switches *(Contact and Non Contact type)*, Volume Boosters, Air Lock Relays, Quick Exhaust Valve,Position Transmitters and Speed Controllers

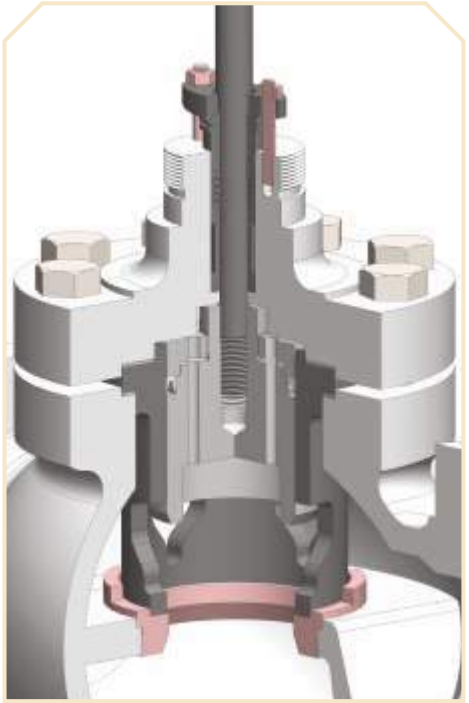
Trim Design Cross Sectional Views



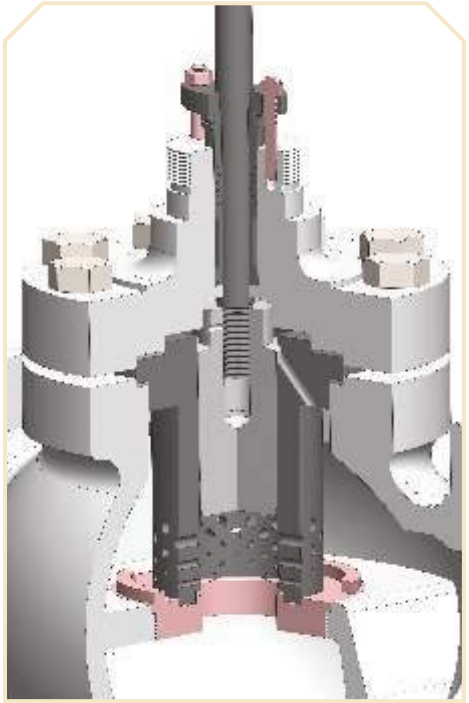
Microspline Trim



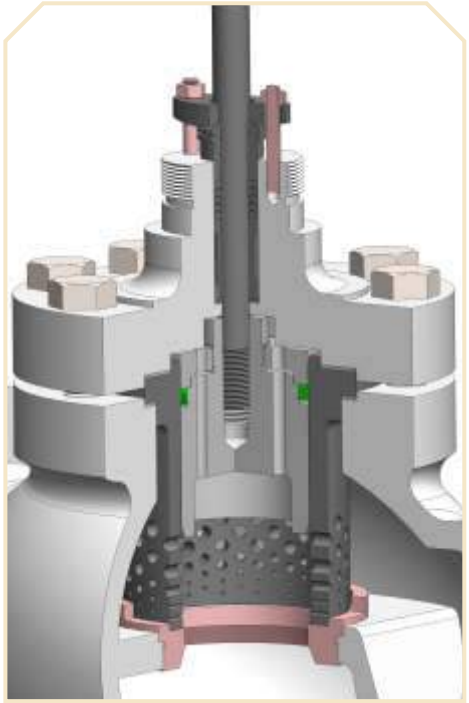
Contoured Trim



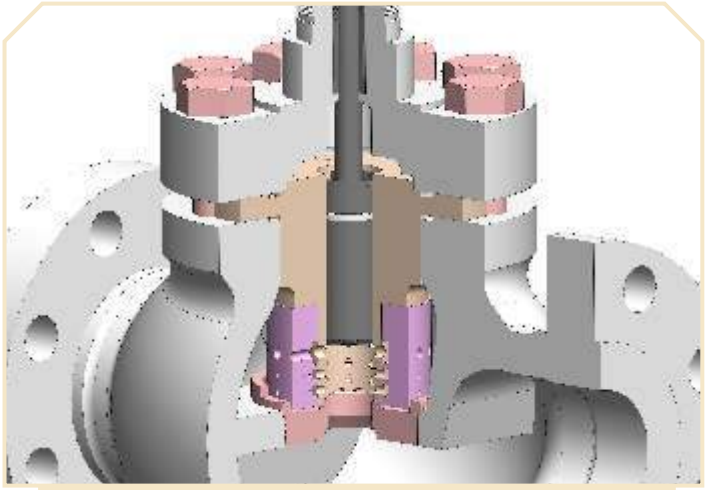
Ported Cage Trim with Balanced Plug



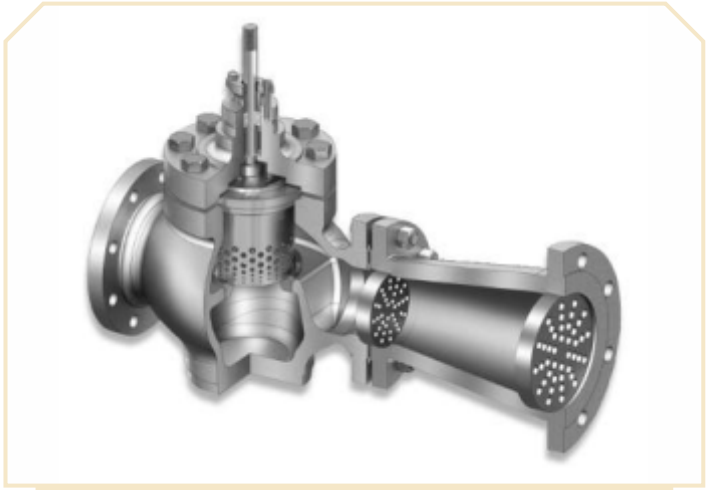
HF Unbalanced Cage guided Valves used for Anti Cavitation and Low Noise Application



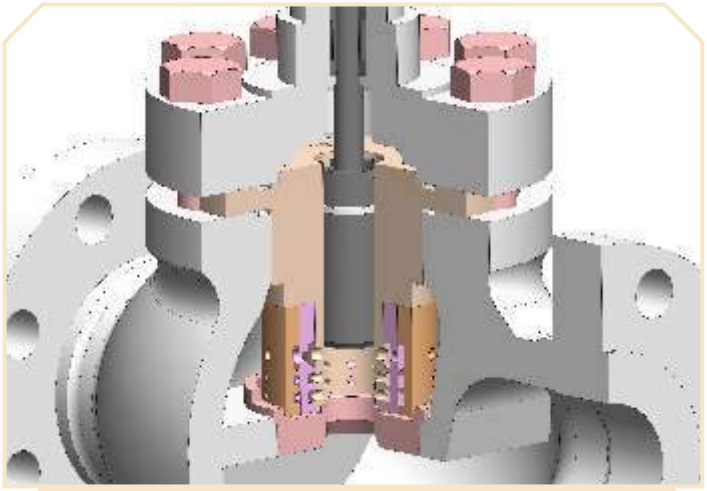
HF Balanced Cage guided Valves used for Anti Cavitation and Low Noise Application



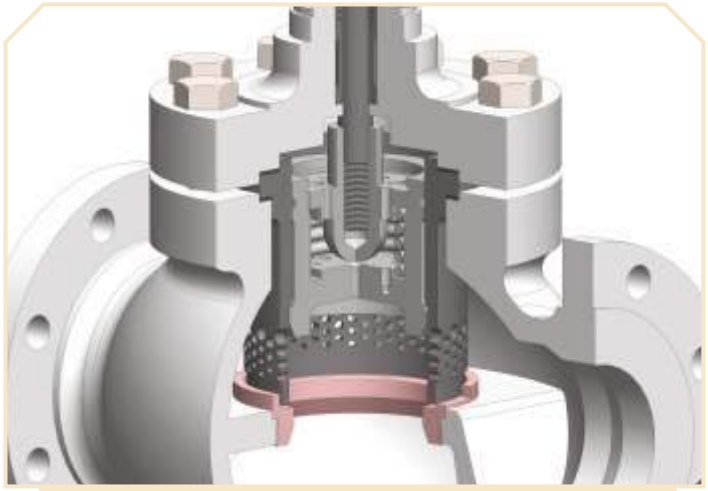
HFD Cage Guided Valves Used for
Anti Cavitation and Low Noise Applications



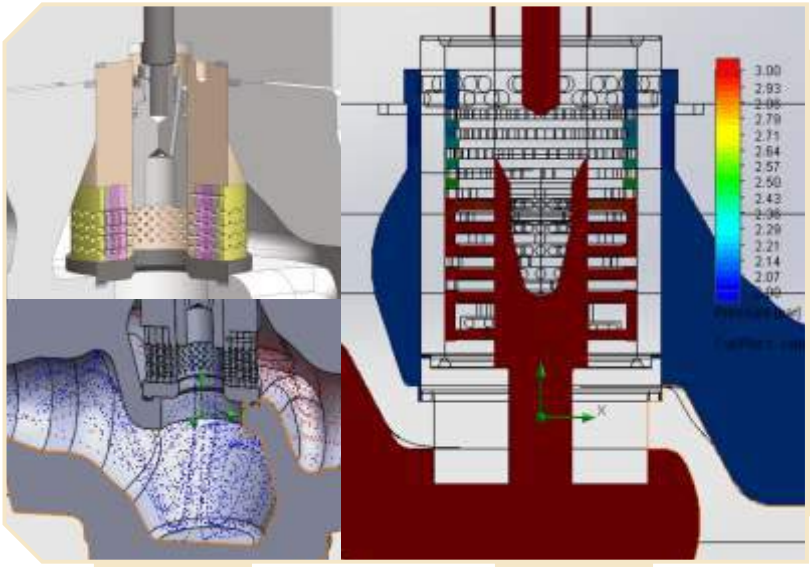
Baffle plate Assembly
for Start up vent applications



HFT Cage Guided Valves Used for
Anti Cavitation and Low Noise Applications



Auxiliary Shut off Pilot Plug
used for Leakage Class V and
Elevated Temperatures



Radial Axial

Multi Stage Multi Path Trim

High pressure drop application.

Characteristics available - Modified equal Percentage or linear.

Direction of Flow:
1. Radial Flow trim design - Flow over.
2. Axial flow trim design - Flow under.

Multistage Multipath Trim are designed to handle the high pressure drop services to mitigate the cavitation / high noise cases.

Valve Size and Rangeability

Inherent Rangeability

Defination

The inherent rangeability of a control valve is the ratio of maximum and minimum flow at constant pressure drop. The rangability of standard plugs are given in the following table.

Table 1: Trim Sizes and Standard Rangeability

Trim Size	Standard Rangeability	
	Contoured	'HF' Range
½" - ¾"	40:1	35:1
1" - 3"	55:1	50:1
4" - 16"	70:1	70:1
Microsplines	Up to 150:1	

Table 2: Valve Trim Types and Leakage Class and Temperature Limit Table

Trim Design	Plug Design	Seats	Sealing Ring	Leakage class	Maximum Temperature
Contoured / HF / Ported / Multistage Multipath	Unbalanced (Std)	Metal	None	IV	550°C
	Unbalanced (Special Lapping)	Metal	None	V	550°C
Contoured	Unbalanced	Soft (PTFE)	None	VI	180°C
HF Cage Guided / Ported / Multistage Multipath	Balanced	Metal	Graphite	IV	400°C
			PTFE	IV	180°C
			Spring Energized PTFE	V	250°C
			Metallic C Seal	V	550°C
HF Cage Guided	Auxiliary Pilot	Metal	Metallic	V	550°C

Bonnet Selection Guide

Selection of Bonnet Design is determined on the basis of both operating temperature range and fluid media being handled.

Table 3: Temperature Limits of Various Bonnets

Component		Temperature			
	°C	-240 to -20	-100 to -20	-20 to 250	250 to 550
	°F	(-400 to -148)	(-148 to 4)	(4 to 482)	(482 to 1022)
Bonnet		Cryogenic	Normalising	Standard	Normalising
Packings		PTFE	PTFE	**PTFE / Graphite	Graphite*

* Graphite upto 400°C ** PTFE upto 180°C

Table 4: Metallic Bellows Seal Working Conditions

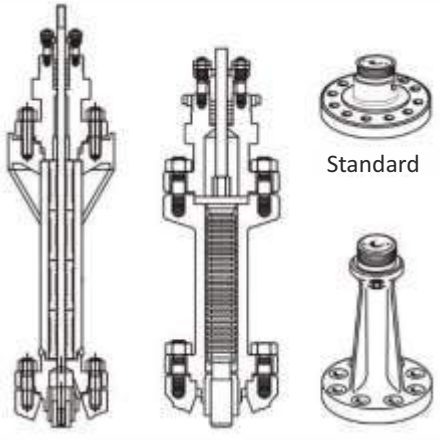
Valve Size		Travel		Maximum working pressure		Temperature Range
Inch	mm	Inch	mm	psig	Bar g	
½-2	15-50	$1^{1}/_{8}$	28	740	51	-65°C to 427°C
2½-4	65-100	1½	40	400	28	
6-8	150-200	2¼	57	345	24	
10-12	250-300	3½	89	300	21	

Note: Higher pressure on request.

Table 4a: PTFE Bellows Seal Working Conditions

Valve Size		Travel		Maximum working pressure	Maximum Temperature Range
Inch	mm	Inch	mm		
½-2	15-50	$^{9}/_{16}$	14.3	6 Bar g	-20°C to 50°C 120°C to 150°C
2½-4	65-100	1¼	28	4 Bar g	

BONNET OPTIONS



Velocity Limitations

In selecting a valve for either a liquid or gas / vapour application, one of the major considerations is the effect of fluid velocity. High velocity could lead to operational problems including erosion, excessive vibration and instability. The following tables indicate the maximum recommended velocity values for liquid and gas / vapour services.

Table 5 : Maximum Inlet and Outlet Velocities for Liquid Flow

Valve Rating	Trim	Direction of Flow	Valve Size		Maximum Velocity			
					Carbon Steel		Alloy Steel	
			Inch	mm	ft / sec	m / sec	ft / sec	m / sec
Upto and Including ANSI 600	Contoured	To close and to open	½ - 1 1½ 2	15 - 25 40 50	41 39 37	12.50 11.90 11.30	46 42 38	14.00 12.80 11.60
			3 4 6	80 100 150	34 32 30	10.40 9.75 9.15	34 32 30	10.40 9.75 9.15
			8 10 12 14	200 250 300 350	29 27 24	8.85 8.25 7.30	29 27 24	8.85 8.25 7.30
			16 18 20 24	400 450 500 600	22 18 12	6.70 5.50 3.70	22 18 12	6.70 5.50 3.70
ANSI 900 and onwards	Contoured	To close and to open	½ - 1 1½ 2	15 - 25 40 50	41 41 41	12.50 12.50 12.50	46 46 46	14.00 14.00 14.00
			3 4 6	80 100 150	41 39 37	12.50 11.90 11.30	42 39 37	12.80 11.90 11.30
			8 10 12 14	200 250 300 350	36 33 31	11.00 10.10 9.45	36 33 31	11.00 10.10 9.45
			16 18 20 24	400 450 500 600	27 22 14	8.25 6.70 4.30	27 22 14	8.25 6.70 4.30
All ratings	'HF' Range	To close and to open	All sizes		43	13.1	52	15.8

Table 6 : Maximum Inlet and Outlet Velocities for Gas and Vapour Flow in Carbon and Alloy Steel Valve Bodies

Valve Rating	Trim	Direction of Flow	Valve Size		Maximum Inlet Velocity		Maximum Outlet Velocity	
			Inch	mm	ft / sec	m / sec	ft / sec	m / sec
Upto and Including ANSI 600	Contoured	To close and to open	½ - 1 1½ 2 3 4	15 - 25 40 50 80 100	340 325 295	104 99 90	For Globe Style Valves Velocity limited to 830 ft / s (253 m / s) (or 0.65 Mach No) whichever greater. Angle Style Valve Velocity upto sonic permissible	
			6 8 10 - 14	150 200 250 - 350	265 220	81 67		
			16 18 20 24	400 450 500 600	190 150 115	58 46 35		
ANSI 900 and onwards	Contoured	To close and to open	½ - 1 1½ 2 3 4	15 - 25 40 50 80 100	425 405 368	130 123 112		
			6 8 10 - 14	150 200 250 - 350	330 275	100 84		
			16 18 20 24	400 450 500 600	235 190 150	72 58 46		
All ratings	'HF' Range	To close and to open	All sizes		475	144		

CONTROL VALVE SIZING AND SELECTION

Flow Coefficient:

RK control valves are sized using the valve coefficient Cv in accordance with ISA standard 75.01.01 is defined as the rate of flow of water in US gallons per minute at 60°F through a control valve at full lift at pressure drop of 1 Psi across the valve.

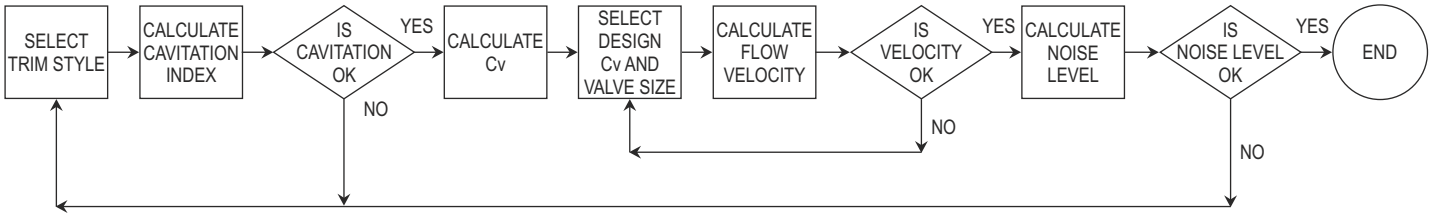
Inherent Flow Characteristics:

The inherent flow characteristic of a control valve is the relationship between the flow and the valve travel at constant pressure drop. As with all caged multi hole trims the actual characteristic may vary slightly from the true curve. The procedure for selecting a valve for liquids and compressible fluids involves calculations for valve flow coefficient, fluid velocities and sound pressure level prediction.

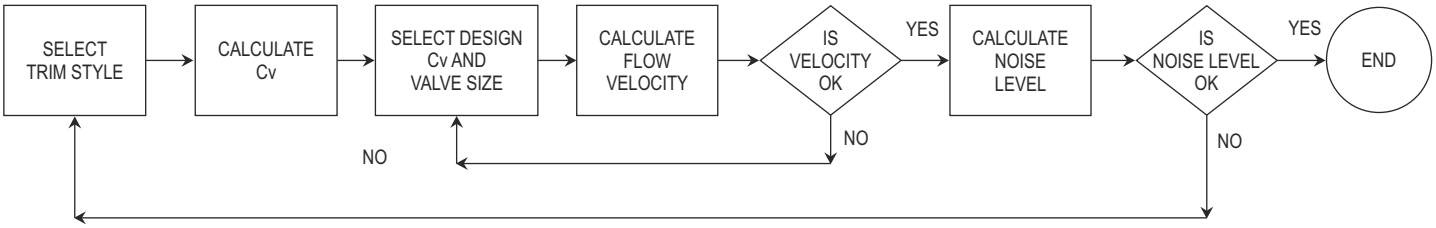
A highly advanced computer software OPTISIZE has been developed by RK Control for control valve sizing and selection. It also maintains a permanent database of computation and details of offers prepared for customers.

The software includes a programme for the actuator which is sized not only for shut-off service but also for maintaining stability of operation at varying load conditions. The selection of a control valve for liquid flow applications involves calculations for cavitation, Cv, velocity, and sound pressure level. For gas / vapour flow it is necessary to consider the inlet/outlet velocities and predicted sound pressure level in addition to evaluating the valve flow coefficient. These are illustrated in the form of flow charts.

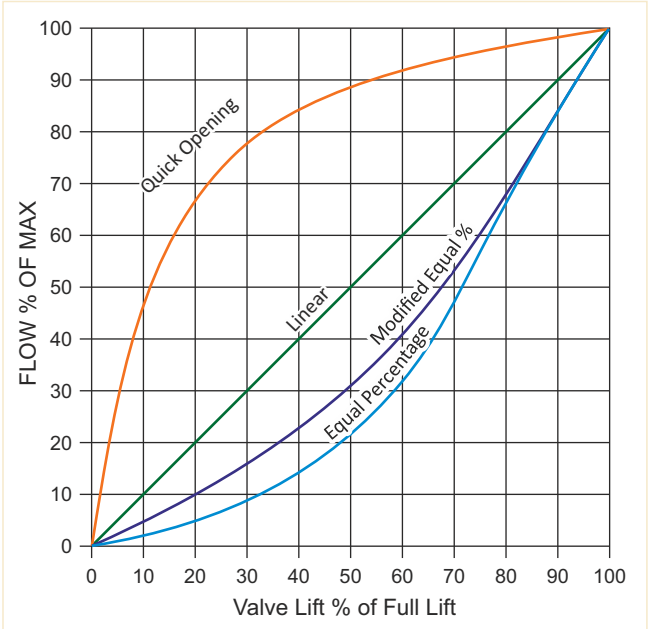
LIQUID FLOW CHART:



GAS / VAPOUR FLOW CHART:



INHERENT FLOW CHARACTERISTIC CURVES



Definitions:

- **Linear:** Flow is directly proportional to valve lift.
- **Equal%:** Flow changes by constant percentage of its instantaneous value for each unit of valve lift.
- **Quick Opening:** Flow increases rapidly reaching near to its maximum at a low lift.
- **Modified Equal%:** Characteristic is in between Linear and Equal percentage characteristic. It provides fine throttling at low flow Capacity and approximately linear Characteristic at higher Capacity

RK CONTROL INSTRUMENTS
Mastering Flow Since 1969

1,2	3	4	5	6	7	8	9	10,11,	12	13	14

TRIM

		Body Size		Body Material		Suffix		Rating & Drilling		Flange Face		Bonnet Type		Trim Type		Trim Size		Trim Material		Surface Treatment		Characterisitcs	
		½"	A	CAST IRON	A	NONE	N	150#	A	FF	A	Standard	1	Microspline	A	No.00	00	304	A	None	A	Q.Open (ON-OFF)	0
		¾"	B	PTFE SOLID	B	IBR	I	300#	B	RF	B	Normalising (Finned)	2	Contoured	B	No.0	01	304L	B	Face Stellite	B	Linear	1
		1"	C	CARBON STEEL A216 WCB	C	JACKETED	J	600#	C	RTJ	C	Bellows	3	Cont. Balanced	C	No.1	02	316	C	Full Stellite	C	EQ%	2
		1¼"	D	CARBON STEEL WCC	D	SPECIAL	S	900#	D	Screwed	D	Extended	4	Ported Solid	D	No.2	03	316L	D	Nitriding	D	Mod. EQ%	3
		1½"	E	CARBON STEEL LC1	E			1500#	E	Socket Weld	E	Cryogenic	5	Ported Balanced	E	No.3	04	410	E	Hardening	E		
		2"	F	CARBON STEEL A352 LCB	F			2500#	F	Butt Weld	F			HF Solid	F	No.4	05	420	F	Soft seating (PTFE)	F		
		2½"	G	CARBON STEEL A352 LCC	G			150# Table 'D'	G	Large T&G	G			HF Balanced	G	No.5	06	440C	G	Seat Welding	G		
		3"	H	1.1/4 CHR MOLY, A217 WC6	H			150# Table 'E'	H	Small Tongue	G			HFD Solid	H	No.6	07	17 - 4PH	H	Cage Nitriding+Seat Weld+Face stel	H		
10	10	4"	I	2.1/4 CHR MOLY, A217 WC9	I			300# Table 'F'	I	Large Male	H			HFD Balanced	I	No.7	08	ALLOY 20	I	Cage Nitriding+Seat Weld+Full stel	I		
10A	1A	5"	J	STAINLESS STEEL A351 CF8	J			300# Table 'H'	J	Large Female	I			HFT Solid	J	No.8	09	HASTELLOY 'B'	J	Cage Stellite+Seat Weld+Face Stel	J		
		6"	K	STAINLESS STEEL A351 CF8M	K			300# Table 'J'	K	Small Female	J			HFT Balanced	K	No.9	10	HASTELLOY 'C'	K	Cage Stellite+Seat Weld+Full Stel	K		
		8"	L	STAINLESS STEEL CF8C (SS 321)	L			600# Table 'K'	L	Small Male	K			V 'Port'	L	No.10	11	Monel	L	Special Lapping	A		
		10"	M	STAINLESS STEEL 304 L CF3	M			600# Table 'R'	M	Large Tongue	L			Pilot Plug	M	No.11	12	HVD1	M	Face Stellite+Special Lapping	B		
		12"	N	STAINLESS STEEL 316 L CF3M	N			150# PN10	N	Small Groove	M			Multistage Multipath Solid	N	No.12	13	DUPLEX SS Gr. 4A/2205	N	Full Stellite+Special Lapping	C		
		14"	O	A351 CN7M ALLOY 20	O			150# PN16	O	Large Groove	N			Multistage Multipath Balanced	O	No.13	14	DUPLEX SS Gr. 5A	O	Face Stellite+Seat weld	O		
		16"	P	HASTELLOY 'B'	P			300# PN25	P	SPECIAL	S			HFD Pilot	P	No.14	15	DUPLEX SS Gr. 6A	P	Full Stellite + Seat weld	P		
		18"	Q	HASTELLOY 'C'	Q			300# PN40	Q					HFT Pilot	Q	No.15	16	Duplex SS A890 CD4MCu	Q	Face Stellite+Seat weld+Spl.Lapping	O		
		20"	R	MONEL 400	R			600# PN100	R							1/16"	17	SS 321	R	Full Stellite + Seat weld+Spl.Lapping	P		
		24"	S	Duplex SS A995 Gr. 4A	T			600# PN64	T							1/8"	18	PTFE	S	Nitriding+Spl.Lapping	D		
				Duplex SS A995 Gr. 5A	U			SPECIAL	S							3/16"	19	NICKEL	T	Hardening+Spl.Lapping	E		
				Duplex SS A995 Gr. 6A	V											¼"	20	SS 316Ti	U	Nitriding+Seat weld	L		
				Duplex SS A890 CD4MCu	W											3/8"	21	SS 304 + PFA	V	Hardening+Seat weld	M		
				MONEL 500	X											½"	22	SS 316 + PFA	W	Hardening+Seat weld+Spl.Lapping	L		
				Stainless Steel 410 CA15	Y											¾"	23	SS 304L + PFA	X	Nitriding+Seat weld+Spl.Lapping	M		
				AL. BRONZE	Z											1"	24	SS 316L + PFA	Y	Cage Nitriding+Seat Weld+Face stel+Spl.Lapping	H		
				Carbon Moly / A217 Gr WC1	1											1¼"	25	SS 416	Z	Cage Nitriding+Seat Weld+Full stel+Spl.Lapping	I		
				Stainless Steel 317 / A351 Gr CG8M	2											1½"	26	SPECIAL	1	Cage Stellite+Seat Weld+Face Stel+Spl.Lapping	J		
				Stainless Steel 317L / A351 Gr CG3M	3											1¾"	27			Cage Stellite+Seat Weld+Full Stel+Spl.Lapping	K		
				A216 Gr WCB + PFA Lined	4											2"	28			Cage Nitriding+Face stell.	Q		
				A351 Gr CF8+PFA Lined	5											2½"	29			Cage Nitriding+Full stell.	R		
				A351 Gr CF8M+PFA Lined	6											3"	30						
				ASTM A351 Gr CK20	7											3½"	31						
				Chrome Moly / A217 Gr C5	8											4"	32						
				NICKEL	9											5"	33						
				SPECIAL	S											6"	34						
																7"	35						
																8"	36						
																9"	37						
																10"	38						
																11"	39						
																12"	40						
																13"	41						
																14"	42						
																16"	43						
																18"	44						
																20"	45						
																22"	46						
																24"	47						

1,2	3	4	5	6	7	8	9	10,11,	12	13	14
	Body Size	Body Material	Suffix	Rating & Drilling	Flange Face	Bonnet Type	Trim Type	Trim Size	Trim Material	Surface Treatment	Characterisitcs

Table 7: Types of Trims and Cv Values of Series 10 Valves upto ASME Class 600 sizes upto 1"

a) Microspline

Cv Values			
Valve Size		Trim Size	Mod Equal %
Inch	mm		
		No. 00	5.0/3.2
		No. 0	1.5
		No. 1	0.75
		No. 2	0.45
		No. 3	0.30
		No. 4	0.20
½	15	No. 5	0.13
¾	20	No. 6	0.075
1	25	No. 7	0.045
		No. 8	0.030
		No. 9	0.020
		No. 10	0.013
		No. 11	0.0075
		No. 12	0.0045
		No. 13	0.0030
		No. 14	0.0020
		No. 15	0.0013

b) Contoured

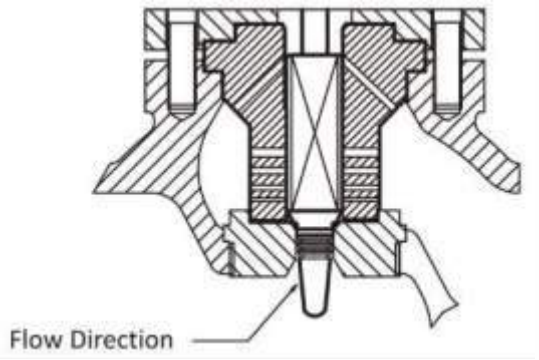
Cv Values					
Valve Size		Trim Size	Equal %	Linear	**Quick Opening
Inch	mm				
½	15	½	5.0	5.0	5.0
		⅜	3.2	3.2	-
		¼	2.0	2.0	-
		3/16	1.2	1.2	-
		⅛	0.63	0.63	-
		1/16	0.40	0.40	-
¾	20	¾	8.0	8.0	8.0
		½	5.0	5.0	5.0
		⅜	3.2	3.2	-
		¼	2.0	2.0	-
		3/16	1.2	1.2	-
		⅛	0.63	0.63	-
		1/16	0.40	0.40	-
1	25	1	13.5*	13.5*	13.5*
		¾	8.0	8.0	8.0
		½	5.0	5.0	5.0
		⅜	3.2	3.2	-
		¼	2.0	2.0	-
		3/16	1.2	1.2	-
		⅛	0.63	0.63	-
		1/16	0.40	0.40	-

* 1 inch Trim with Soft Face plug Cv = 11.0
** Reduced Cv can be given for Quick Opening

c) High Friction Trim For 1" (25mm) Valves

Cv Values					
Valve Size		Trim Size	Equal %	Linear	**Quick Opening
Inch	mm				
1	25	¾	8.0	8.0	8.0
		½	5.0	5.0	5.0
		⅜	3.2	3.2	-
		¼	2.0	2.0	-

** Reduced Cv can be given for Quick Opening



Where trim sizes are designated in inches, it is a nominal size reference and does not signify actual dimensions of the trim. In some cases it may have a very approximate relationship to the seat bore, this should never be assumed for calculation purposes.

Table 8 : Cv Values of Series 10 Valves upto ASME 600 Class

Valve Size Inch (mm)	Trim Size Inch	Contoured Equal % / Linear	Quick open	Ported	HF		HFD		HFT	
					Equal %	Linear	Equal %	Linear	Equal %	Linear
1½ (40)	1½ 1¼ 1 ¾	28 21 13.5 8	32 23 13.5 8	28 21 13.5 8	. 21 15 8	. 21 15 8	. - - 5	. - - 5	. - - -	. - - -
2 (50)	2 1¾ 1½ 1¼ 1	50 - 28 21 13.5	50 - 32 23 13.5	50 - 28 21 13.5	. 44 35 23 15	. 44 35 23 15	. - 16 10 10	. - 16 10 10	. - 10 8 8	. - 10 8 8
3* (80)	3 2½ 2 1¾ 1½	120 85 50 - 28	130 92 55 - 32	105 85 50 - 32	. 85 50 44 35	. 85 50 44 35	. - 38 - 24	. - 38 - 24	. - - - 16	. - - - 16
4 (100)	4 3½ 3 2½ 2	185 - 120 85 50	215 - 130 92 55	170 - 120 85 50	170 145 130 92 55	170 145 130 92 55	. - - 65 38	. - - 65 38	. - - - 32	. - - - 32
6 (150)	6 5 4 3½ 3	440 325 185 - 120	440 360 215 - 130	440 360 185 - 120	380 320 215 170 130	380 320 215 170 130	. - 140 - 95	. - 140 - 95	. - - - 75	. - - - 75
8 (200)	8 6 5 4	620 440 325 185	550 420 335 215	550 420 300 185	. 460 360 235	. 460 360 235	. - 225 140	. - 225 140	. - - 115	. - - 115
10 (250)	10 9 8 6 5	930 - 620 440 325	930 - 700 470 335	930 - 620 420 300	. 790 680 490 360	. 890 680 490 360	. - - 320 225	. - - 330 225	. - - - 180	. - - - 180
12 (300)	12 11 10 8 6	1340 - 930 620 440	1300 - 1140 620 470	1300 - 930 620 420	. 1070 1020 620 490	. 1150 1140 620 490	. - - 420 320	. - - 420 330	. - - 340 270	. - - 340 280
14 (350)	14 12 11 10 8	1850 1340 - 930 620	1600 1340 - 1140 740	1550 1340 - 930 620	. 1280 1120 1020 680	1500 1375 1200 1140 680	. - - 700 420	. - - 700 420	. - - 550 340	. - - 550 340
16 (400)	16 14 12 11 10	2385 1830 1340 - 930	2300 2000 1340 - 1140	2040 1830 1340 - 930	2000 1690 1280 1150 1020	2000 1800 1375 1230 1140	. - 920 - 700	. - 920 - 700	. - - - 550	. - - - 550
18 (450)	18 16 14 12	3010 2385 1830 1340	3206 2540 1940 1420	3685 2920 2230 1640	2650 2050 1520	2800 2150 1640	. - 920	. - 920	. - -	. - -
20 (500)	20 18 16 14	3750 3010 2385 1830	3994 3206 2540 1940	4591 3685 2920 2230	- 3340 2650 2050	- 3550 2800 2150	. -	. -	. -	. -
24 (550)	24 20 18 16	5300 4550 3750 3010	5645 4846 3994 3206	6488 5570 4591 3685	- 5020 4130 3340	- 5360 4440 3550	. -	. -	. -	. -

* We also offer 2 ½" (65mm) Valve size with requisite trims

Table 9 : Cv Values for Body Rating ASME 900 Class

Valve Size Inch (mm)	Trim Size Inch	Ported	HF		HFD		HFT	
			Equal %	Linear	Equal %	Linear	Equal %	Linear
1 (25)	¾	8	8	8	.	.	.	.
	½	5	5	5	-	-	-	-
	⅜	3.2	3.2	3.2	-	-	-	-
	¼	2	2	2	5	5	-	-
1.1/2 (40)	1¼	21	23	.	.	.	.	.
	1	13.5	15	10	10	-	-	-
	¾	8	8	5	5	-	-	-
2 (50)	1¾	.	44	44	.	.	.	.
	1½	28	35	35	-	-	10	10
	1¼	21	23	23	16	16	-	-
	1	13.5	15	15	10	10	8	9
3* (80)	2½	85	85	85	.	.	.	.
	2	50	50	50	38	38	-	-
	1¾	-	44	44	-	-	-	-
	1½	28	35	35	24	24	16	16
4 (100)	3½	.	145	145	.	.	.	.
	3	120	130	130	-	-	-	-
	2½	85	92	92	65	65	-	-
	2	50	56	56	38	38	32	32
6 (150)	5	300	320	320	.	.	.	.
	4	185	215	215	140	140	-	-
	3½	-	170	170	-	-	-	-
	3	120	130	130	95	96	75	75
8 (200)	6	420	460	460	.	.	.	.
	5	300	360	380	225	225	-	-
	4	185	235	236	140	140	115	115
10 (250)	9	.	790	890	.	.	.	.
	8	620	680	680	-	-	-	-
	6	420	480	480	320	330	-	-
	5	300	360	360	225	225	180	180
12 (300)	10	930	1020	1140	.	.	.	.
	8	620	620	620	420	420	340	340
	6	420	490	490	320	330	270	280
14 (350)	12	1340	1280	1375	.	.	.	.
	11	-	1120	1200	-	-	-	-
	10	930	1020	1140	700	700	550	550
	8	620	680	680	420	420	340	340
16 (400)	14	1830	1690	1800	.	.	.	.
	12	1340	1280	1375	920	-	-	-
	11	-	1150	1230	-	-	-	-
	10	930	1020	1140	700	700	550	550

* We also offer 2 ½” (65mm) Valve size with requisite trims

Table 10 : Cv Values for Body Rating ASME 1500 Class

Valve Size Inch (mm)	Trim Size Inch	Ported	HF		HFD		HFT	
			Equal %	Linear	Equal %	Linear	Equal %	Linear
	¾	8	8	.	.	.	.	.
1	½	5	5	-	-	-	-	-
(25)	⅜	3.2	3.2	-	-	-	-	-
	¼	2	2	-	-	-	-	-
1½	1¼	21	23	23	.	.	.	.
(40)	1	13.5	15	15	10	10	-	-
	¾	8	8	8	5	5	-	-
	1¾	.	44	44	.	.	.	.
2	1½	28	35	35	-	-	10	10
(50)	1¼	21	23	23	16	16	-	-
	1	13.5	15	15	10	10	8	9
	2½	85	85	85	.	.	.	.
3*	2	50	50	50	38	38	-	-
(80)	1¾	-	44	44	-	-	-	-
	1½	28	35	35	24	24	16	16
	3½	.	145	145	.	.	.	.
4	3	120	130	130	-	-	-	-
(100)	2½	85	92	92	65	65	-	-
	2	50	55	56	38	38	32	32
	5	300	320	320	.	.	.	.
6	4	185	215	215	140	140	-	-
(150)	3½	-	170	170	-	-	-	-
	3	120	130	130	95	96	75	75
8	6	420	460	460	.	.	.	.
(200)	5	300	360	360	225	225	-	-
	4	185	235	236	140	140	115	115
	9	.	790	890	.	.	.	.
10	8	620	680	680	-	-	-	-
(250)	6	420	480	480	320	330	-	-
	5	300	360	360	225	225	180	180
12	10	930	1020	1140	.	.	.	.
(300)	8	620	620	620	420	420	340	340
	6	420	490	490	320	330	270	280
	12	1340	1280	1375	.	.	.	.
14	11	-	1120	1200	-	-	-	-
(350)	10	930	1020	1140	700	700	550	550
	8	620	680	680	420	420	340	340
	14	1830	1690	1800	.	.	.	.
16	12	1340	1280	1375	920	920	-	-
(400)	11	-	1150	1230	-	-	-	-
	10	930	1020	1140	700	700	550	550

* We also offer 2 ½" (65 mm) with requisite Trims

Table 11 : Cv Values for Body Rating ASME 2500 Class

Valve Size Inch (mm)	Trim Size Inch	Ported	HF		HFD		HFT	
			Equal %	Linear	Equal %	Linear	Equal %	Linear
1 (25)	½ ⅜ ¼	5 3.2 2	5 3.2 2	. - -	. - -	. - -	. - -	. - -
1½ (40)	1 ¾	13.5 8	15 8	15 8	10 5	10 5	- -	- -
2 (50)	1¼ 1	21 13.5	23 15	23 15	16 10	16 10	. 8	. 8
3* (80)	2 1¾ 1½	50 - 28	50 44 35	44 35	24	24	- 20	- 20
4 (100)	2½ 2	85 50	92 55	92 55	65 38	65 38	- 32	- 32
6 (150)	4 3½ 3	185 - 120	215 170 130	215 170 130	140 - 95	140 - 95	- 75	- 75
8 (200)	5 4	300 185	360 235	360 235	225 140	225 140	115	115
10 (250)	6 5	420 300	480 360	480 360	320 225	330 225	108	108

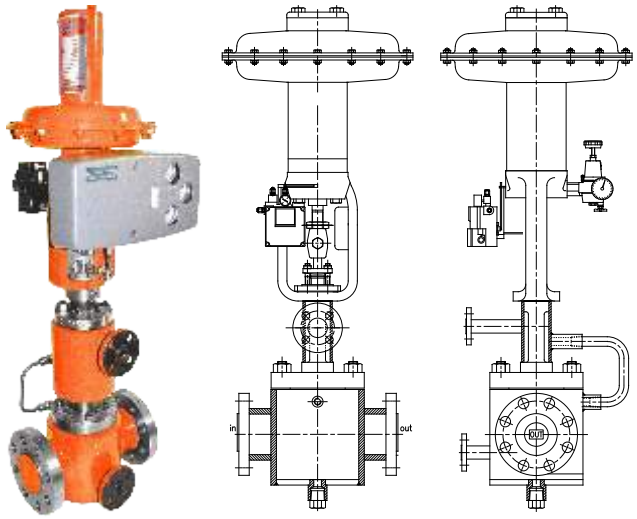
* We also offer 2½" (65 mm) with requisite Trims

STEAM JACKETED VALVE

Types: Partial Jacketing, Full Jacketing

Steam Jacket

1. **Flange End**
   Flange size is normally 1 or 2 sizes greater than actual body size
2. **Face to Face Dimensions**
   As per end flange size and ratings
3. **Steam Jacket Connections (Inlet - Outlet)**
   ½" NPT or Flanged as per requirements
4. **Extended Bonnet**
   Extended Bonnet required to accomodate full jacketing



SPECIAL VALVES

Series 10 - PTFE Control Valves

R.K. Control Instruments offers Series 10 PTFE Control Valves which are specially designed to withstand highly Corrosive fluids in Chemical, Pharmaceutical and Fertilizer Industries

Sizes : ½, ¾", 1", 1.5" and 2"
Rating as Per ASME Class 150
Maximum Pressure handled - 10kg/cm²g with standard bonnet
4 kg/cm²g with PTFE bellows

Maximum Temperature - 180°C

PTFE Valves are developed to cater to the process where very corrosive fluids are involved and cost of exotic metals becomes prohibitively expensive apart from scarce availability.

PTFE (Poly Tetra Fluro Ethylene) being inert is corrosion resistant to most of the fluids.

However, PTFE Valves have limitations with regards to Pressure and Temperature.

The valve body being machined from Solid PTFE Bar, the flow passages are straight as compared to a cast body which lowers the Design Cv.

The below table gives Cv Tables for sizes ½" to 2" Valves

PTFE Valve Size (inches)(mm)	PTFE Trim Size (inches)(mm)	Cv
½" (15)	½" (15)	3.2
¾" (20)	¾"(20)	5
1" (25)	1" (25)	8
1.5" (40)	1.5" (40)	17
2" (50)	2" (50)	28

Lower Cv available on request

PTFE Control Valves

PFA Lined Control Valves

Plug and Stem are of SS316 Coated / Lined with PTFE or of suitable metal.
Seat is Integral with Body. Body can be dismantled and reversed and reassembled to get the renewed seat.

Bellow Sealed Bonnets

These valves can be provided with PTFE Bellows for leak proof operations.
Valve Travel in case of Bellow Sealed Valve, would be limited to $^{9}/_{16}$".

Special / Engineered Valves / Cvs can be offered on request

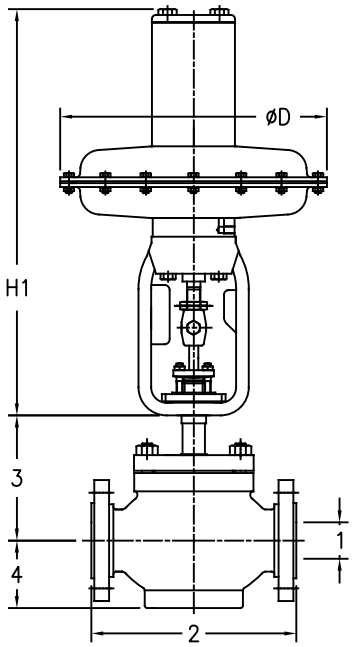
Table 12 : Face to Face Dimension For Flanged Globe Style Control Valves

Size Inch (mm)	FACE TO FACE mm						Height From Center Line			Center Line to Base	Steam Travel
	Class 150 PN 20 BS10T -D,E	Class 300 PN 50 BS10T -F,H,J	Class 600 PN 110 BS10T -K,R	Class 900 PN 150	Class 1500 PN 250	Class 2500 PN420					
1			2					3		4	5
							S	N	B	(MAX.)	
½" (15)	184	190	203	273	273	308	140	222	324	67	28
¾" (20)	184	194	206	273	273	308	140	222	324	67	28
1" (25)	184	197	210	273	273	308	140	222	324	67	28
1½" (40)	222	235	251	311	311	359	159	292	353	83	28
2" (50)	254	267	286	340	340	400	168	298	362	86	28
2½" (65)	276	292	311	410	410	441	203	327	467	111	38
3" (80)	298	318	337	387	406	498	206	327	467	111	38
4" (100)	352	368	394	464	483	575	206	357	467	146	38
6" (150)	451	473	508	600	692	819	276	391	676	171	57
8" (200)	543	568	610	781	838	1022	292	435	686	203	57
10" (250)	673	708	752	864	991	1270	390	632	921	238	89
12" (300)	737	775	819	1016	1130	1321	390	673	-	251	89
14" (350)	889	927	972	1257	1257	-	490	822	-	292	89
16" (400)	1016	1057	1108	1422	1422	-	622	927	-	352	100
18" (450)	1153	1194	1251	-	-	-	620	980	-	420	125
20" (500)	1334	1372	1524	-	-	-	750	1055	-	475	150
24" (600)	1480	1524	1600	-	-	-	985	1170	-	622	150

S - STANDARD BONNET, N - NORMALISING BONNET, B - BELLOWS SEAL BONNET, The Company reserve the right to confirm the dimensions on certified drawing. Face to Face dimension comply with ANSI / ISA 75.08 series. All dimensions are in mm.

Table 13 : Face to Face Dimension For Butt-weld End Globe System Control Valves

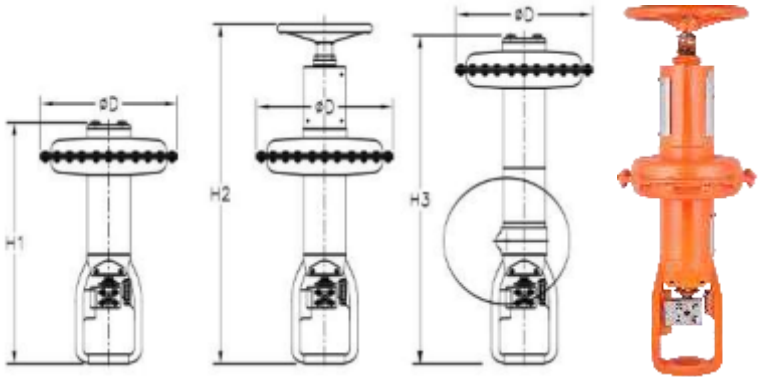
Size Inch (mm)	FACE TO FACE mm		
	(Class 150, 300 & 600) PN 20, 50 & 110	(Class 900 & 1500) PN 150 & 250	(Class 2500) PN 110
½" (15)	203	279	318
¾" (20)	206	279	318
1" (25)	210	279	318
1¾" (40)	251	330	359
2" (50)	286	375	400
2½" (65)	311	375	400
3" (80)	337	460	498
4" (100)	394	530	575
6" (150)	508	768	819
8" (200)	610	832	1029
10" (250)	752	991	1270
12" (300)	819	1130	1422
14" (350)	1029	1257	1803
16" (400)	1108	1422	-



* For H1 & D, refer actuator dimensions

PNEUMATIC SPRING AND DIAPHRAGM ACTUATORS
(Field Reversible)

Dimension for Series A Single Spring Diaphragm Actuators



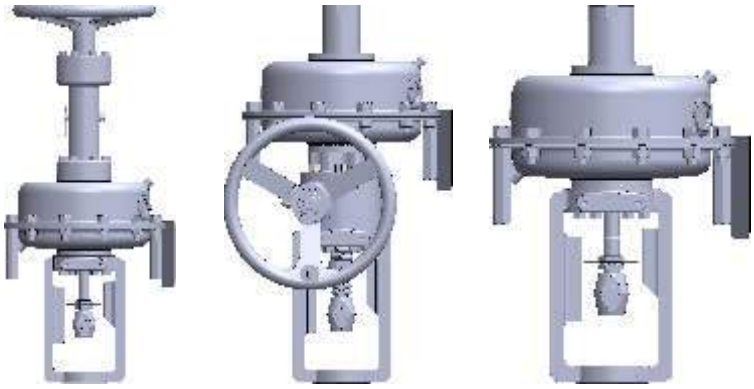
Actuator		Ø D	No Handwheel	TMH	SMH
Size	Travel (mm)	mm	H1 mm	H2 mm	H3 mm
038E	1⅛" (28)	260	355	535	-
038	1⅛" (28)	260	480	720	-
075	1⅛" (28)	330	503	757	717
	1½" (38)		585	920	875
150	1⅛" (28)	457	660	977	879
	1½" (38)		660	1078	940
	2¼" (57)		775	1220	1105
300	2¼" (57)	616	930	-	1245
	3½" (89)		1016	-	1397
	4" (100)		1070	-	1470
300HP	2¼" (57)	616	1000	-	1360
	3½" (89)		1064	-	1488
	4" (100)		1081	-	1527

Single Spring Series A Actuator Numbering System:

Single Spring Series A Actuator Numbering System:
First two characters - Actuator action
A1. Direct Actuator without Valve Positioner
A2. Reverse Actuator without Valve Positioner
A3. Direct Actuator with Valve Positioner
A4. Reverse Actuator with Valve Positioner

Last three digits - Effective Area of Actuator
038E - 38 Sq. Inch (Non Reversible)
038CD - 38 Sq. Inch Compact Design
075 - 75 Sq. Inch
150 - 150 Sq. Inch
300 - 300 Sq. Inch
300HP Sq. Inch with heavy spring
Suffix H - Side Mounted Hand wheel
T - Top Mounted Handwheel
L - Limit stop

Series M Multispring Actuators



Multispring Series M Actuator Numbering System:

First two characters - Actuator action
M1. Direct Actuator without Valve Positioner
M2. Reverse Actuator without Valve Positioner
M3. Direct Actuator with Valve Positioner
M4. Reverse Actuator with Valve Positioner

Last three digits - Effective Area of Actuator
038 - 38 Sq. Inch
075 - 75 Sq. Inch
150 - 150 Sq. Inch
Suffix H - Side Mounted Hand wheel
T - Top Mounted Handwheel
L - Limit stop

Date of issue: January 2026

RK CONTROL INSTRUMENTS

Mastering Flow Since 1969

An ISO 9001 Certified Company

Works (Thane) : Plot No. A-250, Wagle Industrial Estate, Opp. Wagle Police Station, Thane 400 604, Maharashtra, India.
T: 022-6606 0943 • Email: info@rkcipl.co.in, sales@rkcipl.co.in

Works (Rabale) : RTC 51/52, Rabale TTC, MIDC, Rabale, Navi Mumbai 400701, Maharashtra, India.
T: 022-6606 0943 • Email: info@rkcipl.co.in

Chennai : No.22/11, G3, Sai Virat Krishna, Lawyer Jagannathan Street, Behind Le Royal Meridien Hotel, Guindy, Chennai 600 032.
T: 044-4202 3937, 2233 3358 • Email: saleschennai@rkcipl.co.in

www.rkcipl.co.in