

MIL 10000 - Double Ported Top and Bottom Guided Control Valves

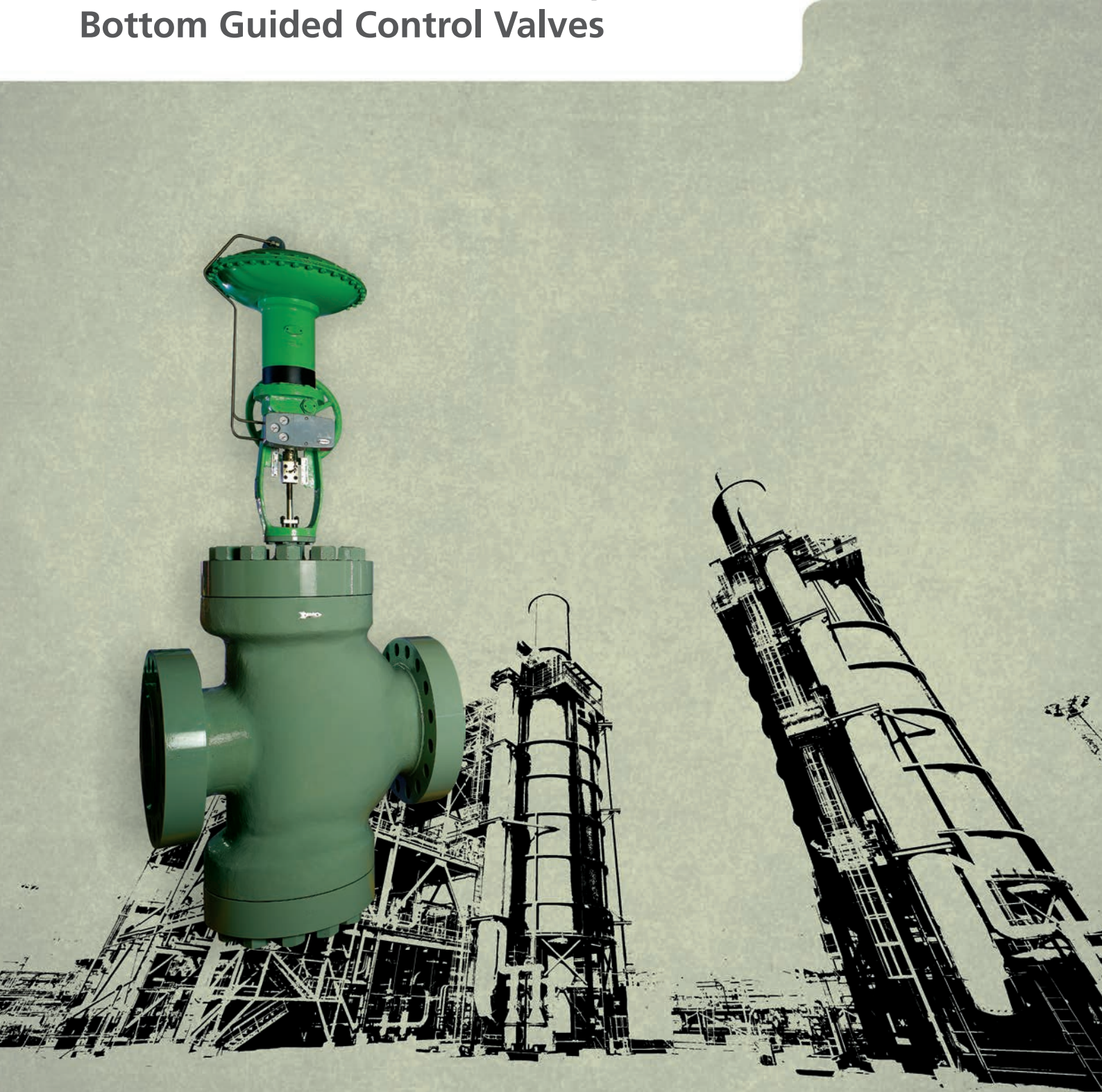
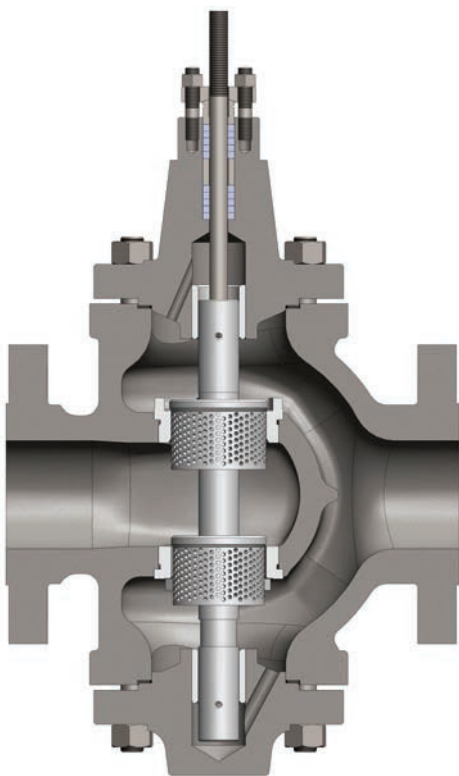




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Introduction

The 10000 Series double ported control valves are designed to handle a wide variety of process applications. Construction features have been carefully selected to provide optimum performance. The concept of the top and bottom guided single seat valve was developed to improve the rigidity of the standard top guided valve for use at higher flow rates and pressure drops. The additional guiding reduces the vibration of the plug, which if severe enough, can cause failure in valves with top guiding only. Double seated valves are inherently balanced and therefore enable economical actuation of larger valves than with a single seated design.



Features

Top and Bottom Guiding

A well accepted industry standard particularly suited for double ported plugs to provide adequate support against side loads.

High Allowable Pressure Drop

Incorporates the simplest form of balanced construction and provides high pressure drop capability with standard actuators.

High Capacity with Low Recovery

Flow capacity is at top levels for contemporary double ported control valves and is attained with very little pressure recovery as indicated by its high critical flow factors.

High Performance Materials

Materials of construction have been selected for high performance and long life when handling the high pressure drop capability of the valve.

Invertible Body and Plug

All 10000 series bodies and plugs are invertible, so either air-to-open or air-to-close action can be obtained with the same spring diaphragm actuator.



Typical Applications

The 10000 series control valve is an excellent choice for applications involving dirty fluids combined with high pressure drops. Large streamlined flow paths offer improved operation in dirty fluid application.

Double seated constructions are ideal for high capacity applications. The guiding of the plug enables the control higher energy flows in a stable manner.





Technical Information

Model Decodification

1 st	2 nd	3 rd	4 th	5 th	6 th	7 th
-	-	1	0	-	-	-
ACTUATOR TYPE		BODY SERIES		PLUG TYPE	TRIM CHARACTERISTICS	TRIM TYPE
20. Hand Operated 37. Direct Spring Diaphragm 38. Reverse Spring ⁽¹⁾ Diaphragm 67. Direct Piston Cylinder 68. Reverse Piston Cylinder 90. Electrical Actuator		10. Double Ported Top and Bottom Guided Control Valves		0. Undefined 1. Double Seat (Std) 2. Double Seat (Special)	0. Undefined 3. Equal % 6. On-Off 7. Linear 8. Lo-dB Linear	0. Undefined 2. Down Seating 4 Up Seating 6. Down Seating (Soft Seat)

⁽¹⁾ : For soft seated valves requiring "Air fail close action"

Standard Sizes / Ratings / End Connections

VALVE SIZE (inch)	RATING (ASME Class)				
	150#	300#	600#	900#	1500#
.75	F	F	FS	FS	FS
1, 1.5 & 2	F	F	FS	FS	FS
3 - 16	FB	FB	FB	FB	FB

F : RF/RTJ Flanged B : Butt Weld S : Socket Weld

Larger size valves and other connections available on request

General Data

BODY	
Type	: Double ported globe
Recommended Flow Direction	: Flow passing into the seats
GLAND SEAL	
Type	: Adjustable double sealed packing box with PTFE or Graphite moulded split rings
Option	: Eco lock (varying density for low emission, PTFE or Graphite) or PTFE V rings
Temperature range	: ≤ 180°C PTFE, > 180°C Graphite

BONNET	
Type	: Stud bolted
Temperature range	: -29°C to 454°C
TRIM	
Plug type	: Double seat, top and bottom guided
Seat type	: Clamped (quick change) with metal or soft seat
Optional	: Adjustable plug skirts with PTFE inserts
Characteristics	: Equal percentage (V-port), linear (contoured) and quick opening



Seat leakage Class / Temperature Range

VALVE SIZE (inch)	RATING (ASME CLASS)	TEMPERATURE RANGE (°C)		SEAT LEAKAGE CLASS (FCI 70.2)
		MIN.	MAX.	
0.75 - 16	150# - 1500#	-29	454	II / III
		-29	232	VI

Flow Coefficients (Rated Cv)

Linear, Equal %

ORIFICE Dia (inch)	UPPER	0.875	1.063	1.438	1.500	1.876	2.000	2.376	2.625	3.500	4.626	5.250	6.375	7.000	8.750	10.500	12.251	14.000
	LOWER	0.797	0.985	1.355	1.422	1.782	1.906	2.282	2.531	3.406	4.531	5.156	6.250	6.875	8.625	10.375	12.126	13.860
VALVE SIZE (inch)	TRAVEL (inch)	RATED Cv																
0.75	0.5	8																
1	0.5	8	12															
1.5	0.75		11		28													
2	1			19			48											
3	1.5					44			110									
4	1.5							78		195								
6	2									78 ² , 180		450						
8	2.5										300			750				
10	2.5											460			1160			
12	3.5												650			1620		
14	4																2000 ³	
16	4																2000 ³	2560 ³

2- with orifice 2.376/2.282

3- Available with equal percentage plug only

Critical flow factor Cf or FI = 0.98 for linear and 0.9 for equal %

Flow Coefficients (Rated Cv)

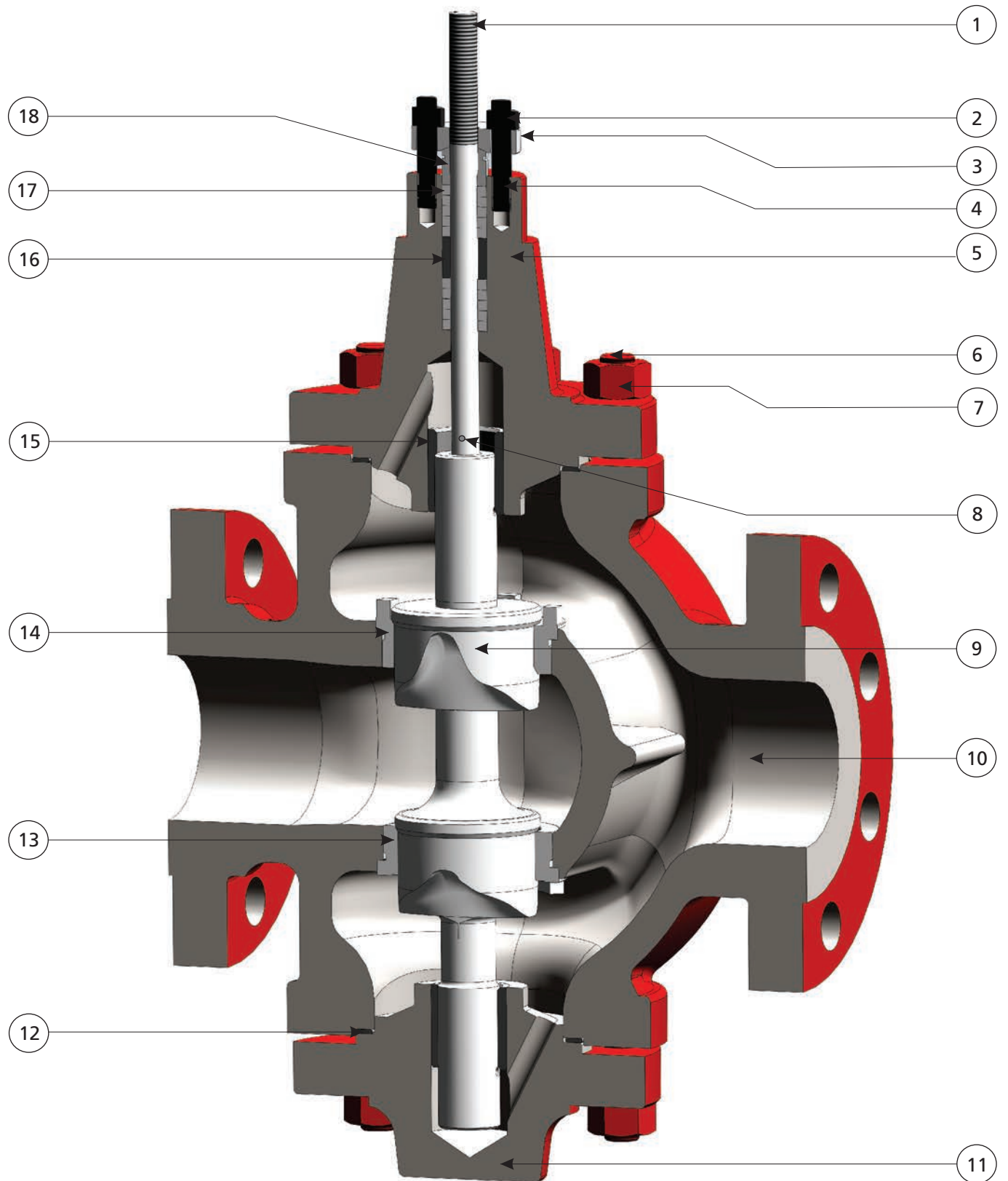
Quick Opening

Orifice Dia (inch)	Upper	0.875	1.063	1.500	1.876	2.000	2.376	2.625	3.500	5.250	7.000	8.750	10.500	12.251
	Lower	0.797	0.985	1.422	1.782	1.906	2.282	2.531	3.406	5.156	6.875	8.625	10.375	12.126
Valve Size (inch)	Travel (inch)	RATED Cv												
0.75	0.5	10												
1	0.5	10	15											
1.5	0.75		11	28,33										
2	1		8.4	19		10 ⁽⁴⁾ , 60, 80 ⁽⁴⁾								
3	1.5				44			140						
4	1.5						78		250					
6	2									200 ⁽⁴⁾ , 540				
8	2.5										400 ⁽⁴⁾ , 980			
10	2.5											1550		
12	3.5												932 ⁽⁴⁾ , 2250	
14	4												2250	

⁽⁴⁾ Available for Lo-dB valves only.



Construction





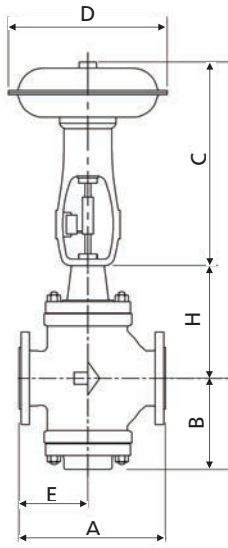
Material of Construction

DRAWING Ref No.	PART NAME	STANDARD MATERIAL *
1	Plug Stem	316 SST
2	Packing Flange Nut	ASTM A 194 Gr 8
3	Packing Flange	ASTM A 105
4	Packing Flange Stud	ASTM A193 Gr B8
5,10	Bonnet, Body	Carbon Steel : ASTM A216 Gr WCC
		Alloy Steel : ASTM A 217 Gr. WC6 / WC9
		Stainless Steel : ASTM A351 Gr CF8M
6	Body Stud	ASTM A194 Gr. 2H
7	Body Nut	ASTM A193 Gr. B7
8	Plug Pin	316 SST
9	Plug	316 / 316 SST Stellite
11	Blind Flange	Carbon Steel : ASTM A216 Gr WCC
		Alloy Steel : ASTM A 217 Gr. WC6 / WC9
		Stainless Steel : ASTM A351 Gr CF8M
12	Body Gasket	316L SST + Graphite
13	Lower Seat Ring	316 SST/ 316 SST Stellite
14	Upper Seat Ring	316 SST/ 316 SST Stellite
15	Guide Bush	440C SST Heat Treated/ 316 SST Stellite
16	Packing Spacer	304 SST
17	Packing	PTFE ≤180 °C / Graphite >180 °C
18	Packing Follower	304 SST

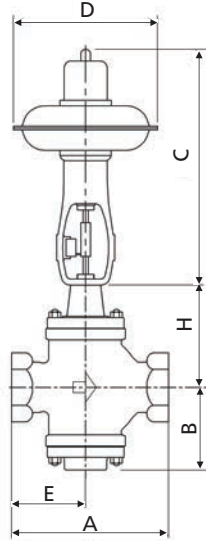
*Material indicated above are for reference only. MIL reserves the right to supply alternate material / forms due to constant product upgradation. Other specific material are available on request.



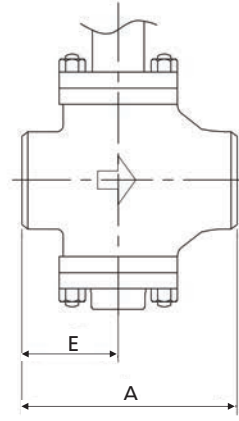
Dimensions and Weights



Flanged Ends (RF / RTJ / FF)



Threaded / Socket Weld End



Butt Weld End

Dimensions (mm)

ASME Class : 150# - 600#

VALVE SIZE (inch)	600# (ASME Class) THREADED - SOCKET WELD AND BUTT WELD		150# (ASME Class) RACED FACE		150# (ASME Class) RING TYPE JOINT		300# (ASME Class) RACED FACE		300# (ASME Class) RING TYPE JOINT		600# (ASME Class) RACED FACE		600# (ASME Class) RING TYPE JOINT		B (Max)	H (Max)
	A	E	A	E	A	E	A	E	A	E	A	E	A	E		
0.75	152	73	184	92	-	-	193	96	206	103	206	103	206	103	114	145
1	152	73	184	92	196	99	196	99	209	104	209	104	209	104	114	145
1.5	203	99	222	103	235	109	234	109	248	115	259	117	259	117	137	153
2	235	105	254	117	266	124	266	124	282	131	284	139	300	134	152	182
3	337	159	298	139	311	146	317	149	333	157	337	159	340	160	198	182
4	394	187	353	167	365	173	368	175	384	183	394	184	397	189	206	240
6	508	222	451	194	466	200	473	205	489	213	508	222	511	224	284	317
8	609	251	543	217	556	224	568	230	584	238	609	251	613	252	340	415
10	705	292	625	252	638	259	660	270	676	278	705	292	708	294	376	456
12	812	327	730	286	743	292	768	305	784	313	812	327	816	329	452	550
14	933	371	851	330	863	337	889	349	905	352	933	371	937	373	546	655
16	981	438	899	399	911	405	937	419	952	427	981	441	984	440	566	665



Dimensions (mm)

ASME Class : 900# - 1500#

VALVE SIZE (inch)	ASME Class 900# RACED FACE		ASME Class 900# RING TYPE JOINT		ASME Class 1500# RACED FACE		ASME Class 1500# RING TYPE JOINT		ASME Class 900# & 1500# BUTT OR SOCKET WELD RING TYPE JOINT		B (max)	H (max)
	A	E	A	E	A	E	A	E	A	E		
0.75	241	121	241	121	241	121	241	121	241	121	114	166
1	248	124	248	124	248	124	248	124	248	124	114	166
1.5	270	130	270	130	270	130	270	130	270	130	137	166
2	311	149	314	151	311	149	314	151	311	149	152	266
3	387	181	391	183	406	190	409	192	406	190	198	266
4	464	219	467	221	482	228	486	230	482	228	206	275
6	530	240	533	241	609	279	616	282	609	279	284	405
8	708	324	711	325	765	353	775	357	765	353	340	903
10	829	384	832	386	905	422	914	427	905	422	375	903
12	895	397	899	399	1026	452	1041	457	1026	449	452	903

Actuator Dimensions

ACTUATOR SIZE	ACTUATOR TYPE : 37 DIRECT			ACTUATOR TYPE : 38 REVERSE		
	DIMENSIONS (mm)		UNPACKED WEIGHT (kg)	DIMENSIONS (mm)		UNPACKED WEIGHT (kg)
	C	D		C	D	
11	421	330	21	617	330	25
13	516	381	32	782	381	40
15	654	445	55	943	445	75
18	848*	527	82	1360*	527	178
24	870*	686	170	1505*	686	210

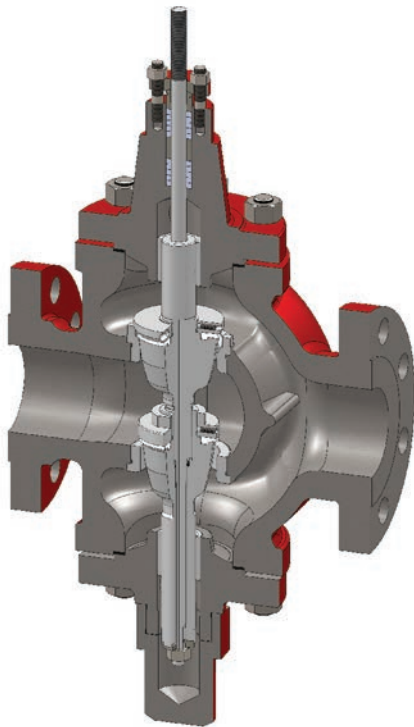
*Actuator height varies with spring range / stroke. Maximum height is indicated. Contact MIL for exact height.



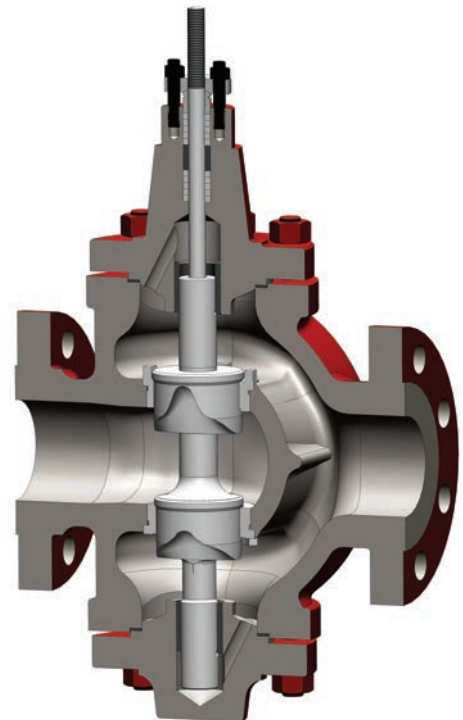
Unpacked Weights (kg)

VALVE SIZE (inch)	600# (ASME Class) SOCKET BUTT WELD & THREADED ENDS	FLANGED				
		150# (ASME Class)	300# (ASME Class)	600# (ASME Class)	900# (ASME Class)	1500# (ASME Class)
0.75	18	36	36	40	73	73
1	20	38	38	45	81	81
1.5	20	47	49	54	97	97
2	22	68	72	79	134	134
3	49	111	115	122	180	185
4	87	138	140	151	177	229
6	165	233	240	269	404	412
8	303	362	374	435	653	662
10	529	612	625	1500	1020	1020
12	658	771	789	861	1292	1292

Note : Consult MIL for 14" and 16" shipping weight



Soft Seat Trim



V- Port Trim



Product Highlights

- Top and bottom guiding
- High allowable pressure drops
- High capacity with low recovery
- Reduced capacity trim
- High performance materials
- Invertible bodies and plugs





Technology that **makes its mark**

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