



A-T Controls, Inc.

V Series (VS/VV/VM) **V-Port Segment Control Valves**



V Series

V-Port Segment Control Valve

The A-T Controls V Series rotary valve is a throttling control segment-ball valve that provides high flow capacity with optimum characteristics for industrial markets including Pulp and Paper, Refinery, Chemical, and Petrochemical Industries.



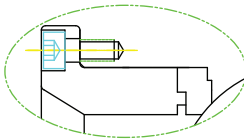
Product Features

- 1) 1-pc body design reduces leakage paths.
- 2) V-segment ball provides large dynamic passing of fluid, including solid particles.
- 3) V-segment ball with top and bottom bearings reduces operational torque.
- 4) Rotary-valve design allows the cutting of solids between the V-ball and the seats, enabling the fluid to pass smoothly without obstructions.
- 5) Spring live-loaded metal seat with Viton® or graphite packing
- 6) Metal seat and a variety of soft seats (STFE Standard) are offered to satisfy various applications. Seat can be easily replaced in a few simple steps.
- 7) Automatic pressure relief design eliminates need for venting
- 8) Nearly equal percentage flow characteristic
- 9) Available in flangeless or flange connection
- 10) ISO 5211 mounting pad
- 11) Anti-static device
- 12) Easy to remove cap design simplifies seat changes and installation of repair kits
- 13) 3-plate internal attenuator available

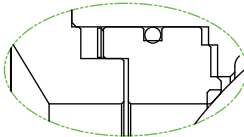
Design Features and Structure

Feature 6

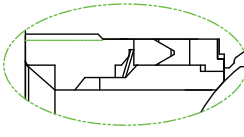
Interchangeable Seats



VS



VV



VM

Feature 9

Optional Flangeless or Flange Connections

Feature 1

1-pc body design

Feature 12

Easy to remove cap design



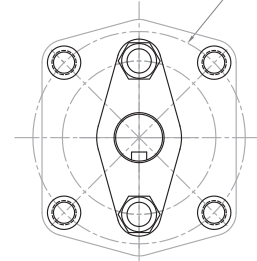
Feature 2

90° "V" cut segment ball design offers excellent flow control

Feature 10

Integral mounting pad

ISO 5211 Mounting Pad



Feature 3

Segment ball design with bearings on top and bottom reducing operational torque.

(See Features on pg 2)

Applications

- Slurry and Viscous Fluid
- Powder and Particles in Fluid
- Chips and Fibers in Pulp and Paper Process
- Flow Control
- Pressure Control
- Steam, Gas and Liquid



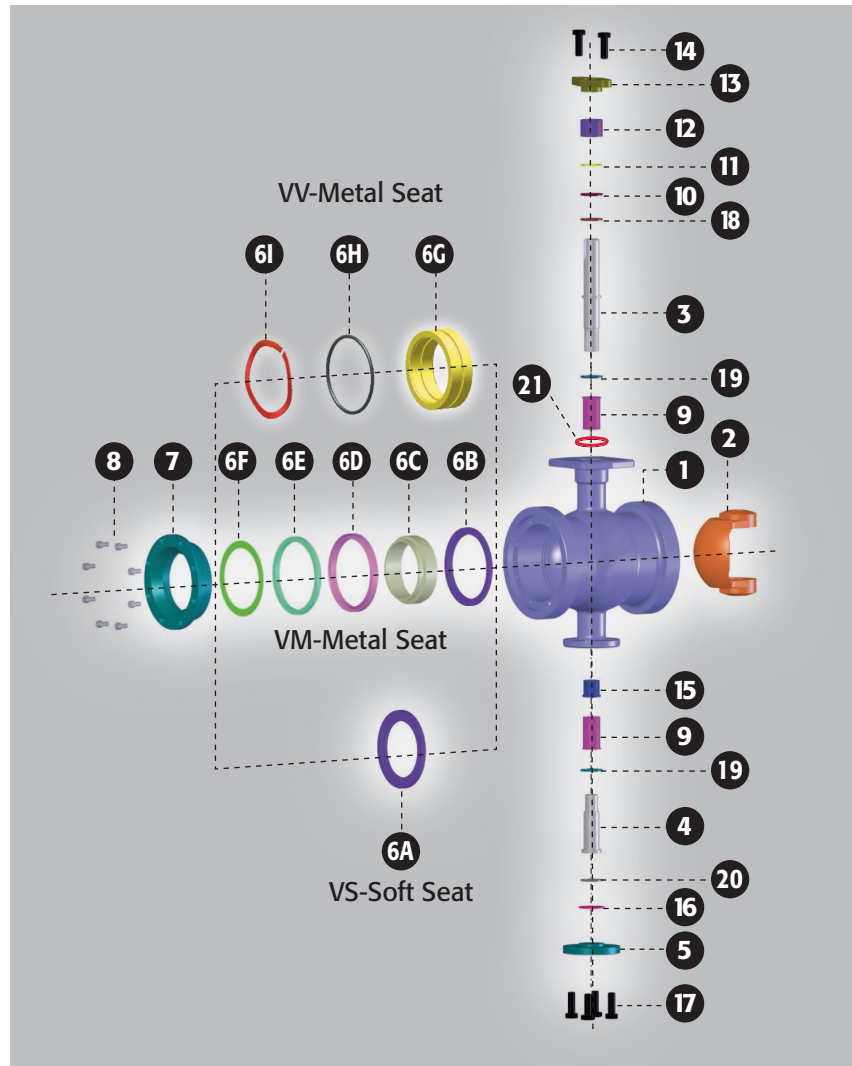
Attenuator in place

V Series

V-Port Segment Control Valve

Applicable Standards

- **Body material:**
Standard in WCB, CF8M
(other Alloys available)
- **Nominal size:**
1" to 16"
- **Pressure rating:**
ANSI Class 150/300
- **End connections:**
Raised Face Flanged & Wafer
- **Flow Rangeability:**
Greater than 150:1
- **Seat leakage:**
According to FCI 70-2(B16.104)
a) Type: Soft seat : ANSI Class VI
b) Type: Metal seat : ANSI Class IV
- **Temperature Range:**
-20° F to 600° F
- **Face to face dimension:**
According to ISA S75.04



Technical Specifications Material List Reference Page

VS Soft Seat - 50/50 STFE Seats - 400° F	5
VV Metal Seat - Viton® Seat Packing - 500° F	6
VM Metal Seat - Graphite Seat Packing - 600° F	7

Technical Specifications

VS Soft Seat - 50/50 STFE Seats - 400° F

MATERIALS LIST

NO	PART NAME	CARBON STEEL	STAINLESS STEEL
1	BODY	ASTM A216 GRADE WCB	ASTM A351 GRADE CF8M
2.1	SEGMENT- SOFT SEAT	ASTM A351 GRADE CF8M	ASTM A351 GRADE CF8M
3	STEM	ASTM A276 SS316	ASTM A276 SS316
4	SHAFT	ASTM A276 SS316	ASTM A276 SS316
5	END COVER	AISI 1045	ASTM A276 SS316
6A*	SOFT SEAT	50/50 STFE	
7	CAP	ASTM A351 GRADE CF8M	
8	BOLT	AISI 304	
9	THRUST BEARING	SS316 + PTFE (Temperature rated to 662°F)	
10*	WASHER	RTFE	
11	WASHER	ASTM A240 SS316 + HARDEN FACE	
12*	GLAND PACKING	RTFE	
13	GLAND	AISI 304	
14	GLAND BOLT	AISI 304	
15	SUPPORT	ASTM A276 SS316	
16*	COVER GASKET	RTFE	
17	COVER BOLT	AISI 304	
18*	STEM O-RING	VITON®	
19*	WASHER	PTFE COMPOSITE	
20*	WASHER	PTFE COMPOSITE	
21	C-CLIP	AISI 316	

* These components are included in the repair kit.

V Series

V-Port Segment Control Valve

Technical Specifications

VV Metal Seat - Viton® Seat Packing - 500° F

MATERIALS LIST

NO	PART NAME	CARBON STEEL	STAINLESS STEEL
1	BODY	ASTM A216 GRADE WCB	ASTM A351 GRADE CF8M
2	SEGMENT- METAL SEAT	ASTM A351 GRADE CF8M + HCr	ASTM A351 GRADE CF8M + HCr
3	STEM	ASTM A276 SS316	ASTM A276 SS316
4	SHAFT	ASTM A276 SS316	ASTM A276 SS316
5	END COVER	AISI 1045	ASTM A276 SS316
6G*	SEAT	ASTM A351 GRADE CF8M + STELLITE®-6	
6H*	O-RING	VITON®	
6I	SPRING	INCONEL® X750	
7	CAP	ASTM A351 GRADE CF8M	
8	BOLT	AISI 304	
9	THRUST BEARING	SS316 + PTFE (Temperature rated to 662°F)	
10*	WASHER	RTFE	
11	WASHER	ASTM A240 SS316 + HARDEN FACE	
12*	GLAND PACKING	RTFE	
13	GLAND	AISI 304	
14	GLAND BOLT	AISI 304	
15	SUPPORT	ASTM A276 SS316	
16*	COVER GASKET	RTFE	
17	COVER BOLT	AISI 304	
18*	STEM O-RING	VITON®	
19*	WASHER	PTFE COMPOSITE	
20*	WASHER	PTFE COMPOSITE	
21	C-CLIP	AISI 316	

* These components are included in the repair kit.

Technical Specifications

VM Metal Seat - Graphite Seat Packing - 600° F

MATERIALS LIST

NO	PART NAME	CARBON STEEL	STAINLESS STEEL
1	BODY	ASTM A216 GRADE WCB	ASTM A351 GRADE CF8M
2.2	SEGMENT- METAL SEAT	ASTM A351 GRADE CF8M + HCr	ASTM A351 GRADE CF8M + HCr
3	STEM	17-4 PH + HCr	17-4 PH + HCr
4	SHAFT	17-4 PH + HCr	17-4 PH + HCr
5	END COVER	AISI 1045	ASTM A276 SS316
6B	SEAT SUPPORT	ASTM A351 GRADE CF8M	
6C*	SEAT	ASTM A351 GRADE CF8M + STELLITE®-6	
6D*	PACKING	GRAPHITE	
6E	SEAT GLAND	ASTM A351 GRADE CF8M	
6F	SPRING	INCONEL® X750	
7	CAP	ASTM A351 GRADE CF8M	
8	BOLT	AISI 304	
9	THRUST BEARING	SS316 + PTFE (Temperature rated to 662°F)	
10*	WASHER	GRAPHITE	
11	WASHER	ASTM A240 SS316 + HARDEN FACE	
12*	GLAND PACKING	GRAPHITE	
13	GLAND	AISI 304	
14	GLAND BOLT	AISI 304	
15	SUPPORT	ASTM A276 SS304/SS316	
16*	COVER GASKET	GRAPHITE	
17	COVER BOLT	AISI 304	
19	WASHER	ASTM A240 SS316 + HARDEN FACE	
20*	WASHER	GRAPHITE	
21	C-CLIP	AISI 316	

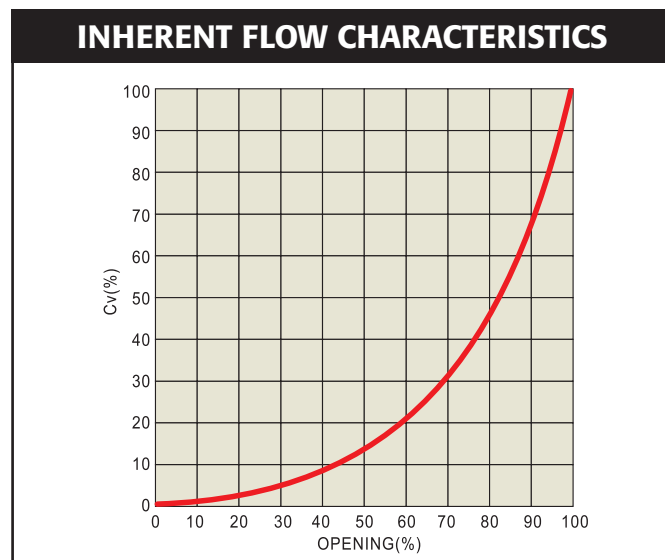
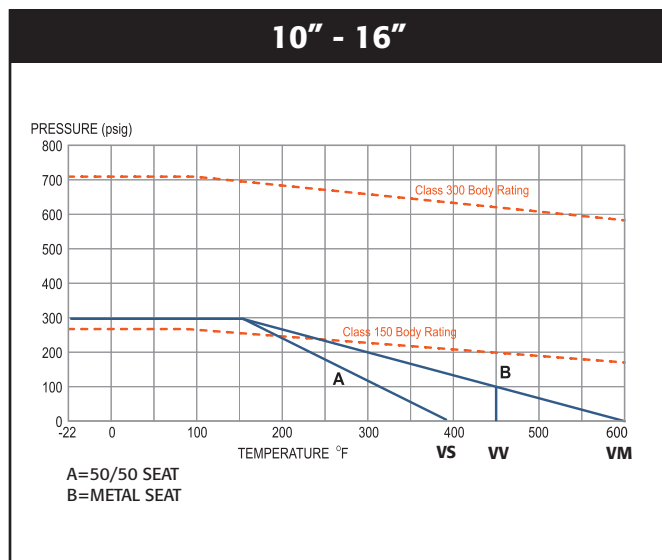
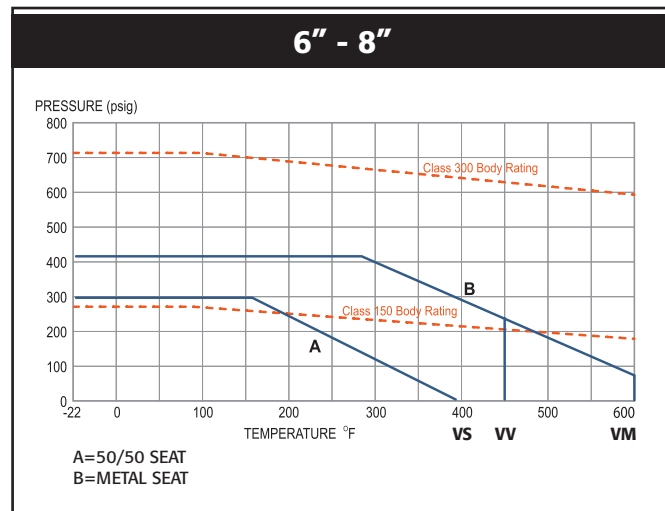
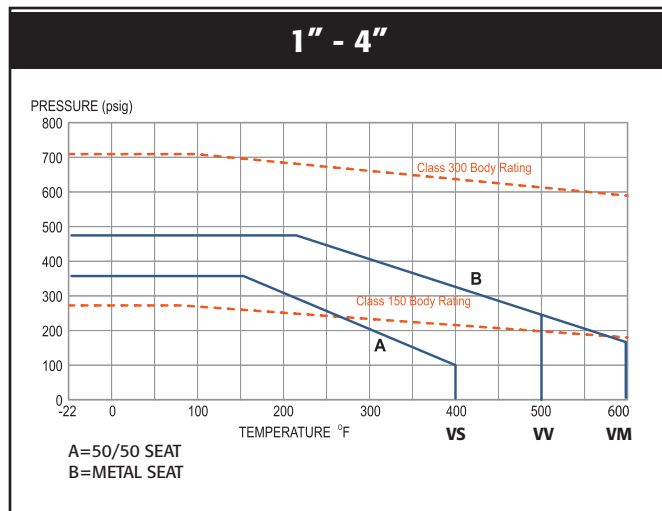
* These components are included in the repair kit.

V Series

V-Port Segment Control Valve

Temperature & Pressure Curves

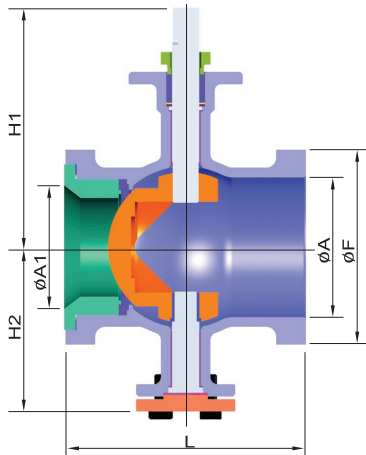
See our metal seated TM3 Series in the Trunnion Mounted Ball Valve catalog for higher temp/pressure applications.



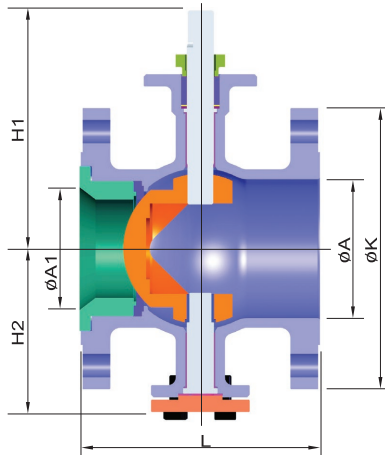
Cv Values - V Series Segment Control Valves

Size	Opening %									
	10	20	30	40	50	60	70	80	90	100
1"	0.01	0.52	1.66	3.44	5.87	9.11	13.36	18.83	27.54	40.5
1-1/2"	0.02	1.06	3.35	6.95	11.85	18.38	26.96	38	55.55	81.7
2"	0.2	2.2	5.3	11	18.75	29.1	42.67	60.12	87.9	129.3
3"	0.6	5.93	14.3	29.67	50.62	78.5	115.2	162.3	237.4	349.1
4"	0.9	8.59	20.7	43	73.3	113.7	166.8	235	343.7	505.5
6"	2.1	21.87	52.7	109.3	186.5	289.5	424.54	598.2	874.8	1,286.5
8"	3.2	28.63	69	143	244	379	556	783	1,145	1,684
10"	5.5	51.77	125	259	442	685	1,005	1,416	2,040	3,045
12"	7.5	62.3	177	366	625	970	1,420	2,002	2,927	4,300
14"	1.73	75.3	237.4	492.2	839.5	1,302	1910.7	2663.4	3,937	5,790
16"	2.27	98.3	310.2	643	1,097	1,702	2,497	3,480	5,145	7,566
F _L	0.93	0.93	0.91	0.9	0.85	0.81	0.75	0.75	0.61	0.51
X _T	0.66	0.65	0.63	0.6	0.57	0.55	0.51	0.4	0.33	0.3
F _D	0.58	0.65	0.71	0.79	0.89	0.92	0.93	0.95	0.97	0.98

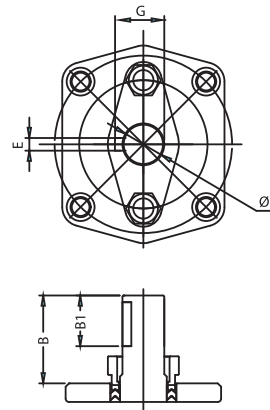
Flangeless Wafer Type 1"-12"



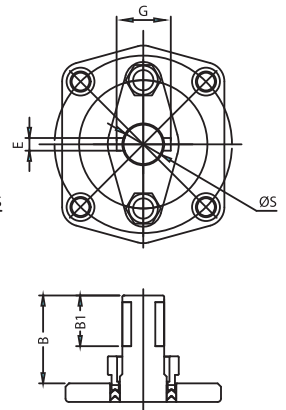
Flanged Type 1"-16"



1"~4"



6"~16"



Dimensions (IN)

Size	A	A1	F	K-150 RFF	K-300 RFF	L	H1	H2	B	B1	E	G	S	ISO 5211	Weight (lbs)			
															Class 150	Class 300	Wafer	Add Attenuator
1"	1.30	0.98	2.52	4.25	4.88	4.01	4.25	2.75	1.32	0.79	0.197	0.689	0.610	F05	8	13	5.5	-
1½"	1.93	1.57	3.23	5.00	6.14	4.49	5.28	3.31	1.77	1.18	0.197	0.689	0.610	F07	12	20	8.3	-
2"	2.36	1.97	3.94	5.98	6.50	4.88	5.59	3.62	1.77	1.18	0.197	0.689	0.610	F07	16	29	10.6	0.4
3"	3.50	3.15	5.16	7.48	8.27	6.50	6.46	4.41	1.77	1.18	0.315	0.984	0.866	F07	32	44	20	1.3
4"	4.45	3.94	6.22	9.01	10.00	7.64	7.64	5.28	2.01	1.18	0.315	0.984	0.866	F10	48	73	33	2.0
6"	6.30	5.20	8.50	10.98	12.52	9.01	9.13	6.73	2.05	1.18	0.315	1.221	0.984	F10	80	113	63	6.4
8"	7.87	7.87	10.51	13.50	15.00	9.57	10.98	7.80	2.76	1.77	0.315	1.417	1.181	F14	130	191	100	11.1
10"	9.92	9.84	-	15.98	17.48	11.69	12.83	9.21	2.97	2.17	0.551	1.823	1.429	F14	218	316	-	25.9
12"	11.81	11.22	-	19.01	20.51	13.31	15.20	10.71	3.37	2.64	0.551	2.402	1.890	F16	364	465	-	46.9
14"	13.78	13.23	-	21.00	22.99	15.75	17.72	13.39	4.53	3.15	0.787	2.992	2.638	F16	562	750	-	-
16"	15.75	15.16	-	23.50	25.51	15.75	19.88	14.69	5.31	3.94	0.787	2.992	2.638	F16	750	992	-	-

Face to Face dimension L according to ISA S75.04
Dimensions subject to change.

Cv Values - V Series with Attenuator

Attenuator Option

A three-plate attenuator is available as an option in the segment control valves, sizes 2"-12". The attenuator is designed to break pressure drop down to lower the pressure recovery of the control valve.

This allows the valve to operate in higher pressure drop applications to help prevent cavitation and reduce noise production from the valve. The design lets the valve maintain its shutoff rating as well as maintain an equal percent flow characteristic. Compare the Cv flow table with the attenuator.



Size	% Open									
	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
2"	0.2	1.4	3.7	5.6	9.3	13	19.1	26.1	34.5	46.6
3"	0.6	4.2	11.2	16.8	28	39.2	57.4	78.4	103.6	140
4"	0.9	6.6	17.6	26.4	44	61.6	90.2	123.2	162.8	220
6"	2.1	16	42.6	64	106.6	149.2	218.5	298.5	394.4	533
8"	3.2	23.7	63.2	94.8	158	221.2	323.9	442.4	584.6	790
10"	5.5	41.1	109.6	164.4	274	383.6	561.7	767.2	1013.8	1370
12"	7.5	56.1	149.6	224.4	374	523.6	766.7	1047.2	1383.8	1870
F _L	0.95	0.95	0.95	0.93	0.90	0.86	0.79	0.75	0.70	0.67
x _T	0.71	0.68	0.65	0.64	0.61	0.58	0.52	0.47	0.41	0.38
F _D	0.58	0.65	0.71	0.79	0.89	0.92	0.93	0.95	0.97	0.98

V Series

V-Port Segment Control Valve

V-Port Segment Torques (In-Lbs)

VS Series 50/50 STFE Seat	PSIG	75	150	220	285	360	435	500
	1"	150	150	160	160	170	170	190
	1-1/2"	175	175	175	175	190	200	215
	2"	230	230	245	245	260	270	290
	3"	675	675	700	700	700	725	725
	4"	750	750	800	815	930	930	1,000
	6"	1,680	1,720	2,000	2,200	2,750	3,000	
	8"	2,225	2,600	3,050	3,400	3,750		
	10"	2,700	3,500	4,300	5,500			
	12"	4,400	6,500	7,900	10,300			
	14"	7,480	11,050	13,114	17,304			
	16"	12,716	18,785	21,664	28,725			

V-Port Segment Torques (In-Lbs)

VV Series Metal Seat w/ Viton®	PSIG	75	150	220	285	360	435	500	580
	1"	150	160	175	200	220	235	265	300
	1-1/2"	185	200	215	235	265	295	320	340
	2"	215	225	235	265	290	330	350	390
	3"	490	565	700	840	915	1,035	1,170	
	4"	565	690	800	915	1,035	1,170	1,310	
	6"	1,220	1,700	2,225	2,750	3,160	3,960		
	8"	1,635	2,925	3,975	4,800	5,265			
	10"	2,635	3,500	5,265	7,015				
	12"	4,690	7,015	8,775	11,700				
	14"	8,208	12,276	14,742	19,656				
	16"	14,774	21,852	24,472	32,629				

V-Port Segment Torques (In-Lbs)

VM Series Metal Seat w/ Graphite	PSIG	75	150	220	285	360	435	500	580
	1"	190	200	225	250	275	300	335	375
	1-1/2"	235	250	275	300	335	375	410	435
	2"	275	285	300	335	365	425	450	500
	3"	620	720	900	1,075	1,165	1,315	1,500	
	4"	720	870	1,020	1,165	1,315	1,500	1,660	
	6"	1,550	2,160	2,800	3,500	4,010	5,035		
	8"	2,100	3,720	5,060	6,100	6,700			
	10"	3,350	4,475	6,700	8,930				
	12"	6,000	8,950	11,160	15,000				
	14"	10,200	15,215	18,749	25,200				
	16"	14,774	21,852	24,472	32,629				

Notes:

1. Torques are based on forward flow. Torque will increase if installed reverse flow.

V-Port Segment Control Valve Manual Part Number Matrix

2	Valve Series		6	Seat, Lining & Trim Materials
VS	Segment V-port Soft Seat		S	50/50 STFE Seats (Standard For VS)
VM	Segment V-port Metal Seat, Graphite Packing		T	TFM™-1600 Seats
VV	Segment V-port Metal Seat, Viton® O-Ring		2	Tungsten Carbide Coated 316 SST Seats & Ball (Standard For VM)
3	Body Material		3	HCr Coated Ball w/ Stellite® Inlay Seats (Standard For VV)
Blank	No Designation = Stainless Steel Body and Trim CF8M-316SST (-450° F to 1100° F)		7	Operator Options
C	Carbon Steel Body, A216 Gr WCB (-20° F to 800° F)		X	No Specials, Series Standard (Bare Stem)
L	Low Carbon 316 SST, CF3M-316L (to 800° F)		G	Gear Operator
D	CD3MN Duplex SST		H	Gear Operator with Lockout Plate
G	CE3MN Super Duplex SST		8	Special Designation
5	LCB, A352 (-50° F to 800° F)		X	No Specials
8	LCC, A352 (-50° F to 650° F)		C	Attenuator
6	WC6, A217 (-20° F to 1100° F)			
9	WC9, A217 (-20° F to 1100° F)			
4	End Connection			
F1	ANSI Class 150 Flanged Ends			
F3	ANSI Class 300 Flanged Ends			
W1	Wafer			
5	Valve Size			
0100	1"			
0150	1-1/2"			
0200	2"			
0300	3"			
0400	4"			
0600	6"			
0800	8"			
1000	10"			
1200	12"			
1400	14"			
1600	16"			



How To Order

1	2	3	-	4	-	5	-	678
↓	↓	↓		↓		↓		↓↓↓
blank	VM	C	-	F3	-	0150	-	3XX



9955 International Blvd.
Cincinnati, Ohio 45246
www.atcontrols.com

PHONE (513) 247-5465
FAX (513) 247-5462
sales@atcontrols.com



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