

Product Reference Guide

A Guide to the Clarke Valve Dilating Disk™ Valve Product Line

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Clarke Valve™ Dilating Disk™ Valve

The Clarke Valve / Dilating Disk™ Valve design range is NPS .25" to NPS 12" sizes. The Dilating Disk™ Valve is an innovative, compact valve designed in accordance with ASME B16.34: Valves Flanged, Threaded, and Welding End and design approved under SIL3. The design provides precise flow control, through the use of a three-petal design, conforms to ANSI/FCI 70-2 leakage specifications, and requires low operational torque. The unique, patented design has a greater flow capability than valves equal and larger in size, which makes it a good economical choice for new constructions. In addition, the lower weight of the design, when compared to globe valves and rotary ball valves makes the Dilating Disk™ Valve an attractive solution. See below for Dilating Disk™ Valve Petal Reference Image.

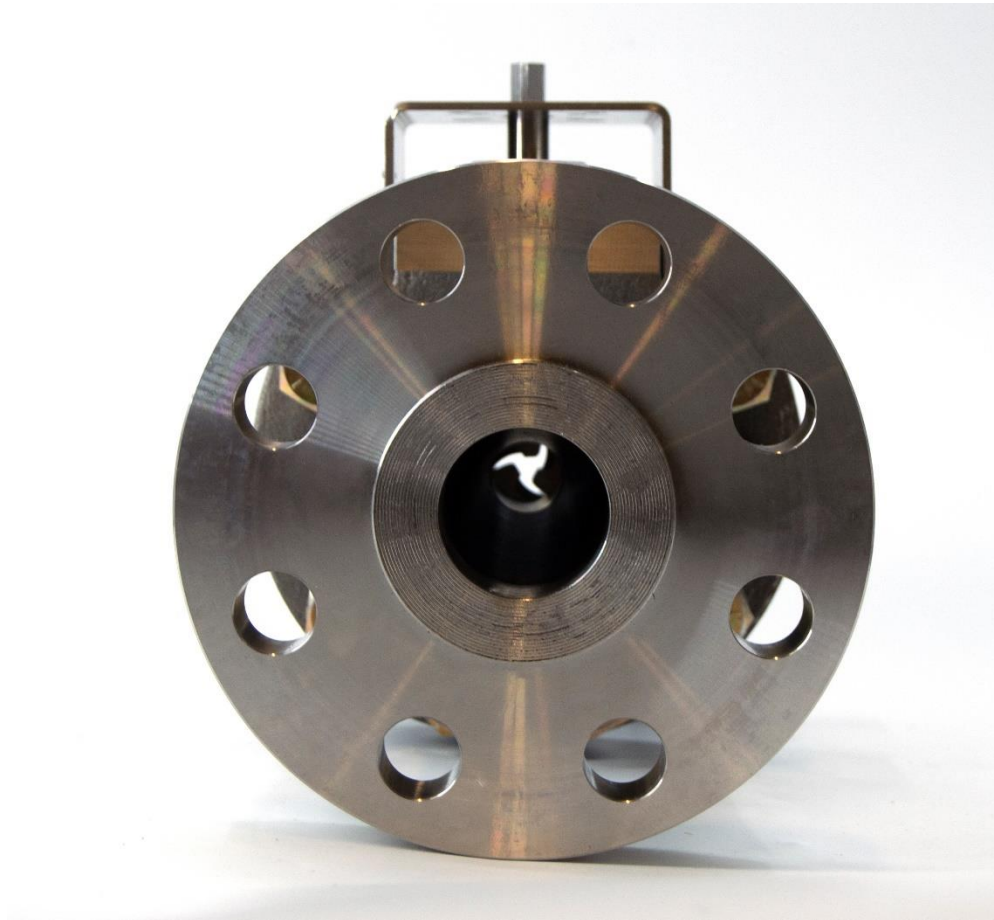


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Table 1: Specifications

Feature	Description
Style	Dilating Disk™ Valve™ Dilating Disk
Sizes (NPS)	Dilating Disk™ Valve is offered in 0.25", 1", 1.5", 2", 3", 4", 6", 8", 10", 12" sizes. The 0.25" size valve is the smallest control valve ever made, able to fit in 0.25" pipelines for low flow applications. Special valve sizes available, please contact Clarke Valve.
Pressure Classes	Dilating Disk™ Valve is available in pressure classes 150, 300, 600, 900, 1500. For additional pressure classes, please contact the Clarke Valve team.
End Connections	Dilating Disk™ Valve comes standard with flanged end connections but can be made with threaded end connections upon request.
Face to Face	Face to face dimensions are available in accordance with ISA 75.08 and ANSI B16.10 for a seamless valve replacement. Customized face to face dimensions can be made available upon request.
Trim Type	Patented trim design consists of three interlocking petals, opening perpendicular to the flow of process fluids, with the closure member moving in a direction perpendicular to the plane of the seat.
Seat Leakage	In accordance with ANSI/FCI 70-2 standards Dilating Disk™ Valve comes standard Class IV, can also meet Class V and VI standards.

Table 2: Features

Feature	Description
Full Bore	Minimal pressure drops at full open, reduces fluid structure interactions from cavitation, very high rangeability.
Quarter Turn	All typical quarter turn actuators are used.
Petal Design	The three-petal design provides precise flow control and very high rangeability.
Shutoff	Design meets or exceeds requirements for seat leakage for control valves.
Seat Leakage Classifications	Dilating Disk [™] Valve complies with Class IV, V, and VI shut off classification in accordance with ANSI/FCI 70-2. For more information, please contact Clarke Valve.
Low Torque	Design requires low torque to unseat, operate and shut off, reducing actuator size, reducing assembly weight, and reducing overall cost.
Navy Applications	Dilating Disk [™] Valve is designed to meet the harsh requirements of shipboard service in accordance with MIL Spec-V-24509A, MIL Spec-DTL-32632.
Coatings	Components can be coated to withstand corrosive flow applications.

Feature	Description
Materials of Construction	Dilating Disk [™] Valve can be manufactured in a variety of materials (see Table 3), please consult Clarke Valve for your application needs.
Hazardous Applications	Dilating Disk [™] Valve is designed for hazardous applications, please contact Clarke Valve for more information.
Maximum Working Pressure	All constructions, consistent with applicable pressure/temperature ratings per ASME B16.34, are shown in Table 6 and Table 7 of this document. The pressure & temperature limits in this document, and any applicable code or standard limitation, should not be exceeded.
Temperature Limits	Standard temperature limits for the materials of construction in accordance with ASME B16.34. Temperature limits for materials should not exceed the limits within B16.34.
Elastomers	Elastomers are chosen to suit the application conditions. See Table 5.
Flow Coefficients	See tables 10 – 14.
Maximum Shaft Rotation	90 degrees/quarter-turn.
Actuator Mounting	Standard ISO 5211 actuator to valve interface.
Face to Face Dimensions	Standard face to face dimensions are available in accordance with ISA 75.08, in addition, customized face to face dimensions are available to meet the application requirement for displacing current valve installed.

Table 3: Dilating Disk™ Valve Materials of Construction: Valve Body & Bonnet

Dilating Disk™ Valve Materials of Construction
304L
316L
WCB
WCC
CF3M
CF8M

(1) Additional Materials Available by Customer Request

Table 4: Dilating Disk™ Valve End Connection Types

Dilating Disk™ Valve End Connection Types
Raised Face Flange
RTJ Flange
NPT

Table 5: Examples of Materials for Nonmetallic Parts for Applications Shown

Material	Typical Temperature Range (°F)	Typical Application Fluids
EPDM	-60 to 300	Water, Methanol, Sea Water, Detergents
Viton	-13 to 446	Water, Petrochem, Sea Water, Detergents
Kalrez®	-4 to 527	Water, Methanol, Petrochem, Acids, Sea Water, Detergents
Buna N	-40 to 257	Water, Methanol, Petrochem, Sea Water, Detergents
PTFE	-100 to 400	Water, Methanol, Petrochem, Sea Water, Detergents
Accrolon® 1640	-400 to 500	Water, Steam, Methanol, Petrochem, Sea Water, Detergents, LNG (Cryogenic)

(1) Typical temperature ranges shown, specific application condition determines material.

(2) Consult Clarke Valve for specific application materials, other materials available.

Table 6: Maximum Allowable Pressure (Body Ratings) for WCB and Other Group 1.1 Materials

Temperature Range	Pressure Class				
	CL150	CL300	CL600	CL900	CL1500
°F	psig				
-20 to 100	285	740	1480	2220	3705
200	260	680	1360	2035	3395
300	230	655	1310	1965	3270
400	200	635	1265	1900	3170
500	170	605	1205	1810	3015
600	140	570	1135	1705	2840

(1) Values taken from ASME B16.34 – Table VII-2-1.1

Table 7: Maximum Allowable Pressure (Body Ratings) for WCC and Other Group 1.2 Materials

Temperature Range	Pressure Class				
	CL150	CL300	CL600	CL900	CL1500
°F	psig				
-20 to 100	290	750	1500	2250	3750
200	260	750	1500	2250	3750
300	230	730	1455	2185	3640
400	200	705	1405	2110	3520
500	170	665	1330	1995	3325
600	140	605	1210	1815	3025

(1) Values taken from ASME B16.34 – Table VII-2-1.2

Table 8: Maximum Allowable Pressure (Body Ratings) for CF3M, CF8M & Other Group 2.2 Materials

Temperature Range	Pressure Class				
	CL150	CL300	CL600	CL900	CL1500
°F	psig				
(-20) to 100	275	720	1440	2160	3600
200	235	620	1240	1860	3095
300	215	560	1120	1680	2795
400	195	515	1025	1540	2570
500	170	480	955	1435	2390
600	140	450	900	1355	2255

(1) Values taken from ASME B16.34 – Table VII-2-2.2

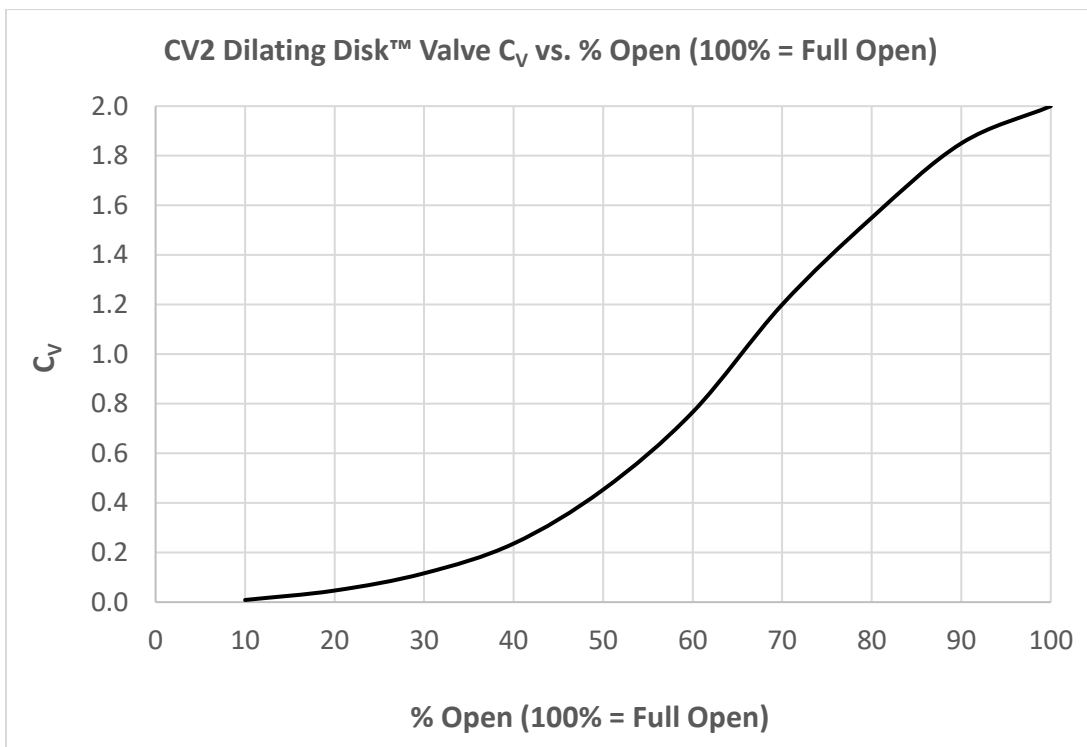
Table 9: Maximum Allowable Pressure (Body Ratings) for 304L & 316L: Group 2.3 Materials

Temperature Range	Pressure Class				
	CL150	CL300	CL600	CL900	CL1500
°F	psig				
-20 to 100	230	600	1200	1800	3000
200	195	510	1020	1535	2555
300	175	455	910	1370	2280
400	160	420	840	1260	2100
500	150	395	785	1180	1970
600	140	370	745	1115	1860

(1) Values taken from ASME B16.34 – Table VII-2-2.3

Table 10: CV2 Valves – Flow Coefficients

% Open	C _v	K _v	F _L	X _T
10	0.00858	0.0074	0.99	0.63
20	0.0466	0.040	0.96	0.52
30	0.116	0.100	0.90	0.44
40	0.236	0.204	0.87	0.40
50	0.453	0.392	0.84	0.40
60	0.766	0.663	0.75	0.44
70	1.20	1.038	0.60	0.50
80	1.55	1.341	0.48	0.48
90	1.85	1.600	0.41	0.40
100	2.00	1.730	0.37	0.33



Testing has been conducted in accordance with ANSI/ISA-75.02.01-2008

Table 11: CV20 Valves – Flow Coefficients

% Open	C _v	K _v	F _L	X _T
10	0.113	0.098	0.99	0.53
20	0.352	0.305	0.96	0.55
30	0.987	0.854	0.90	0.49
40	1.86	1.61	0.87	0.43
50	3.89	3.37	0.84	0.39
60	7.76	6.71	0.75	0.36
70	12.8	11.1	0.60	0.33
80	17.3	14.9	0.48	0.31
90	19.5	16.8	0.41	0.27
100	20.0	17.3	0.37	0.22

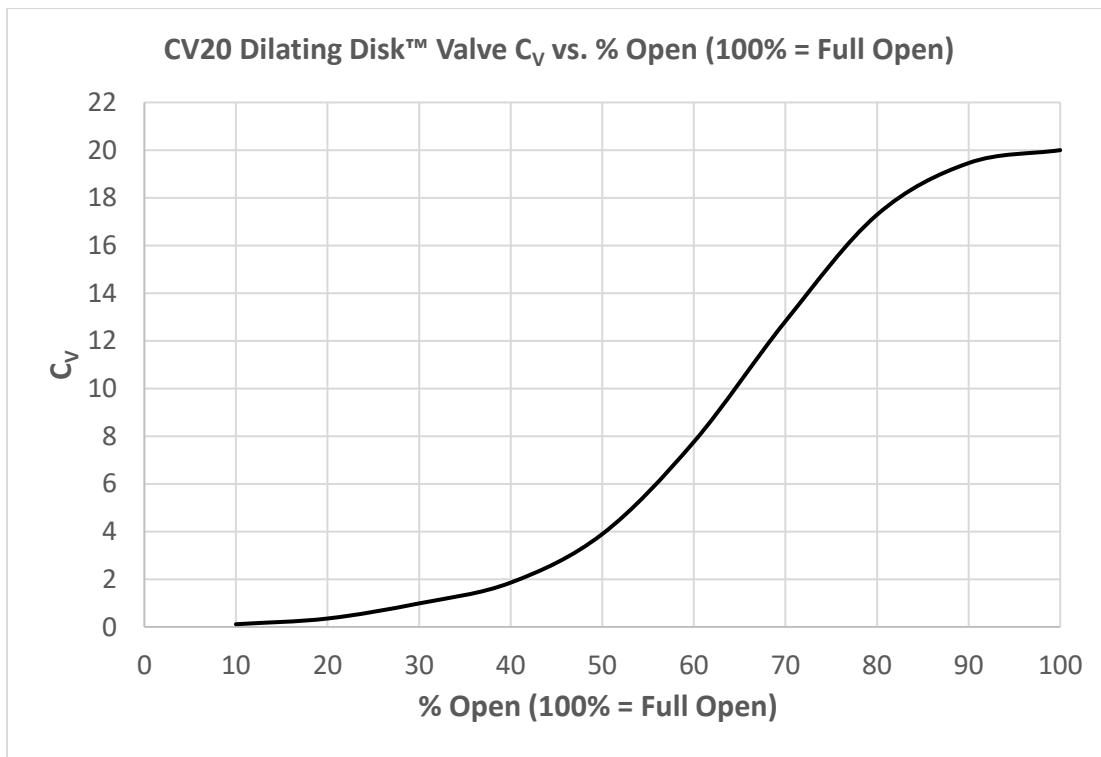


Table 12: CV71 Valves – Flow Coefficients

% Open	C _v	K _v	F _L	X _T
10	0.400	0.346	0.99	0.45
20	1.25	1.08	0.96	0.65
30	3.50	3.03	0.90	0.61
40	6.60	5.71	0.87	0.65
50	13.8	11.9	0.84	0.61
60	27.6	23.8	0.75	0.57
70	45.5	39.4	0.60	0.41
80	61.4	53.1	0.48	0.27
90	69.1	59.7	0.41	0.16
100	71.0	61.4	0.37	0.15

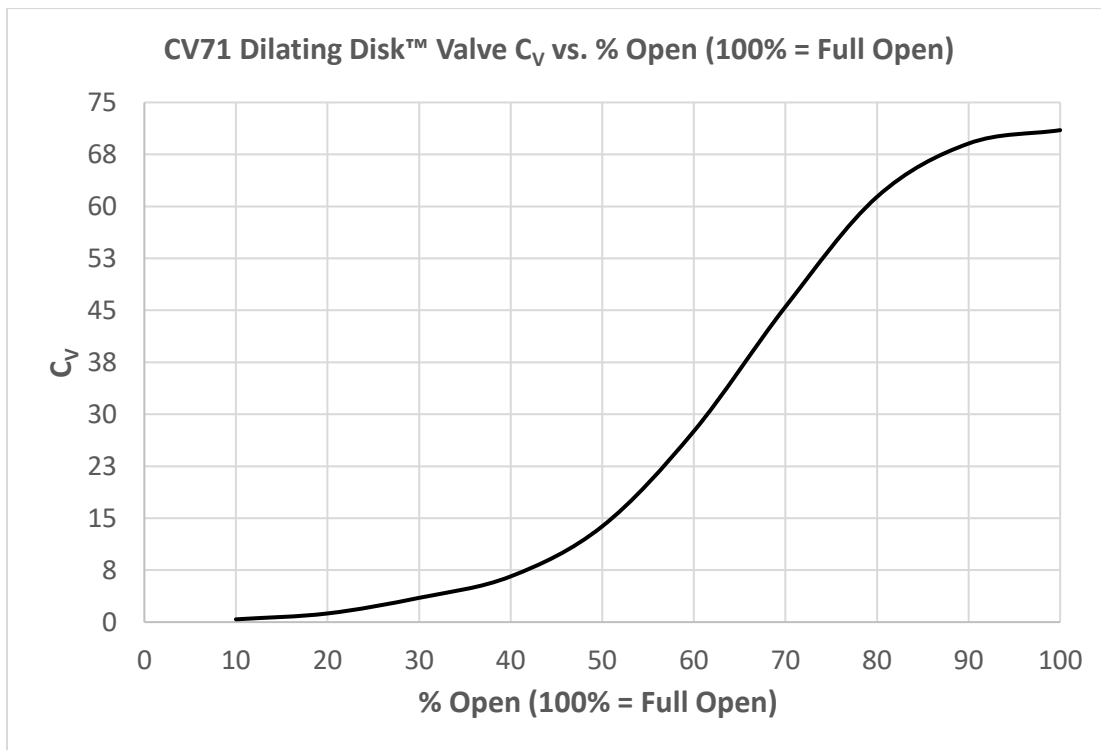


Table 13: CV308 Valves – Flow Coefficients

% Open	C _v	K _v	F _L	X _T
10	2.00	1.7	0.98	0.49
20	6.08	5.2	0.93	0.49
30	12.0	10.4	0.81	0.46
40	22.2	19.2	0.76	0.42
50	41.0	34.5	0.71	0.37
60	70.1	60.6	0.56	0.34
70	118	102	0.36	0.32
80	194	168	0.23	0.31
90	280	242	0.17	0.28
100	308	266	0.14	0.22

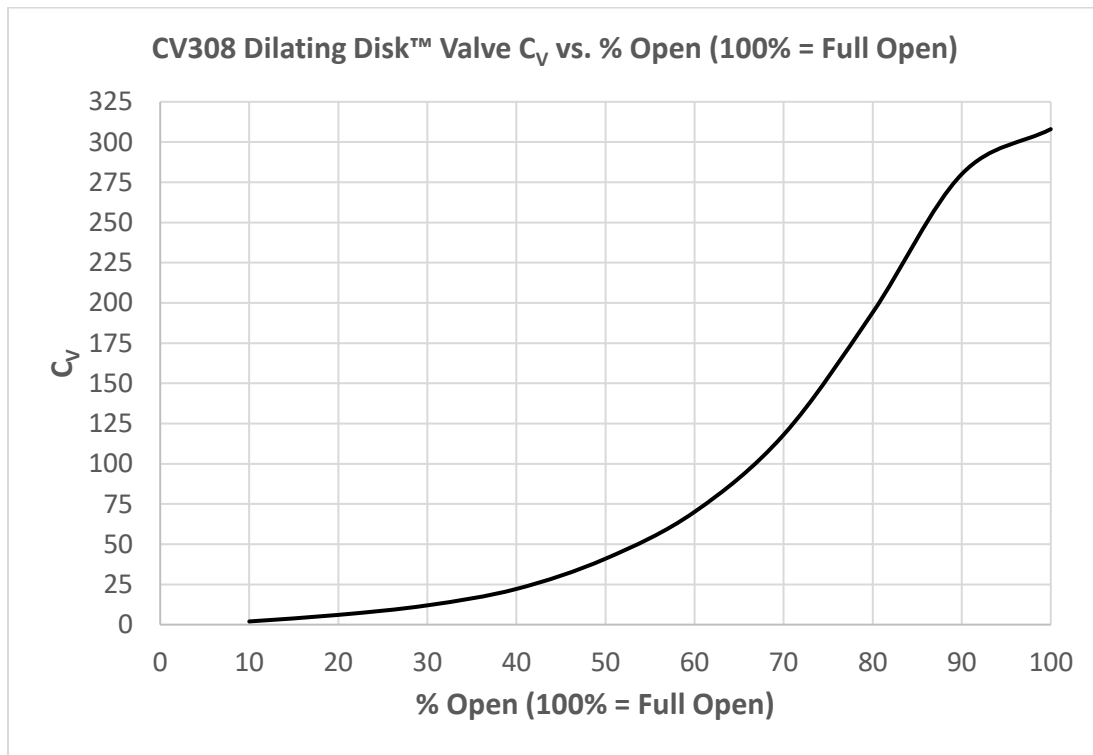


Table 14: CV1345 Valves – Flow Coefficients

% Open	C _v	K _v	F _L	X _T
10	9.00	7.79	0.98	0.52
20	26.0	22.5	0.93	0.49
30	53.0	45.8	0.81	0.42
40	97.0	83.9	0.76	0.36
50	181	156	0.71	0.32
60	303	262	0.56	0.28
70	515	445	0.36	0.24
80	844	731	0.23	0.19
90	1220	1055	0.17	0.17
100	1345	1163	0.14	0.14

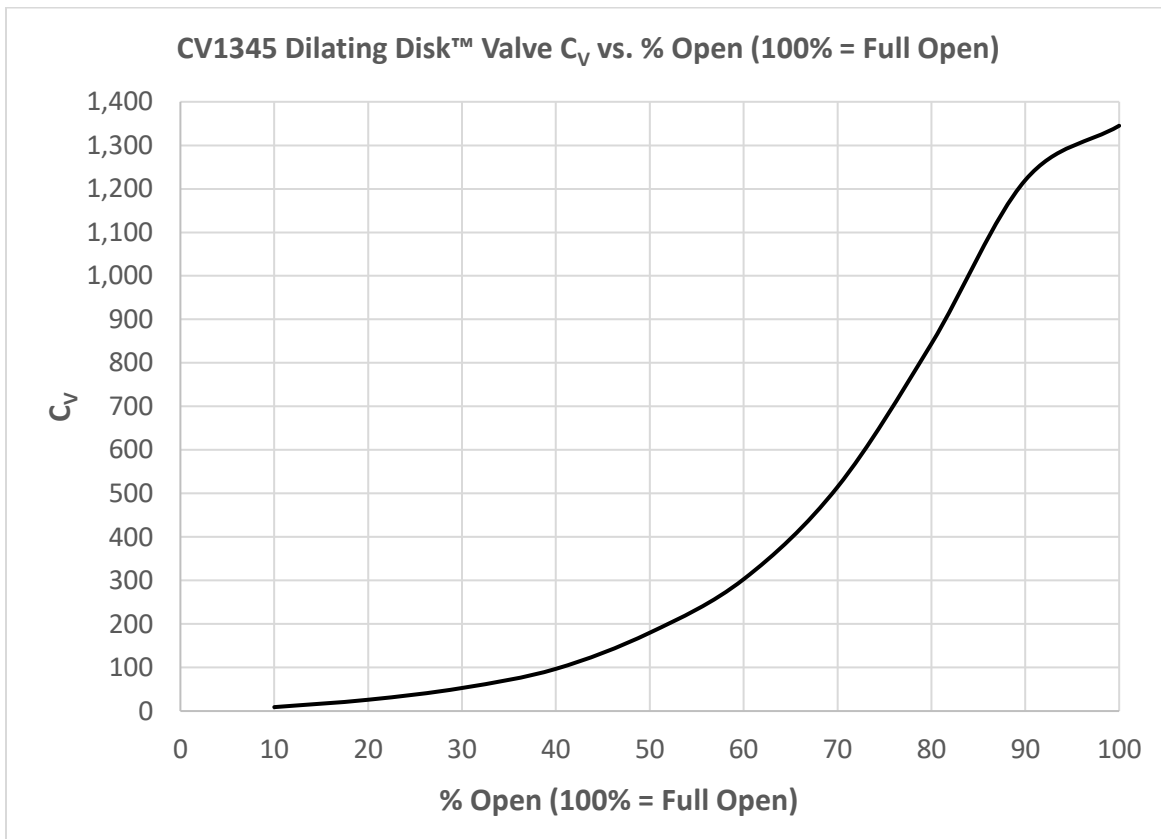
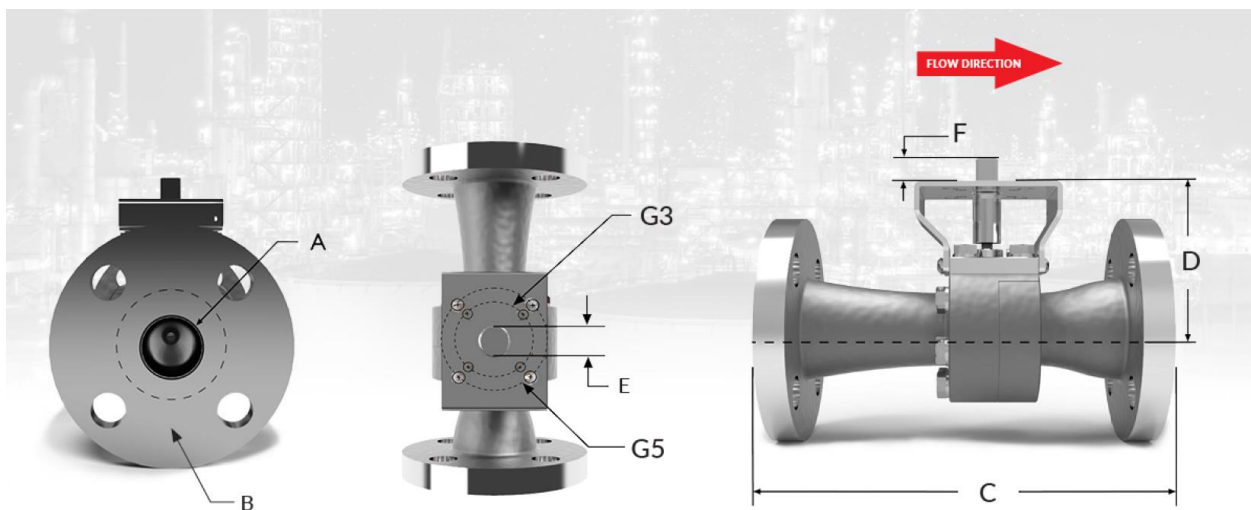


Table 15: CV2 Dilating Disk™ Valve Dimensions & Weight

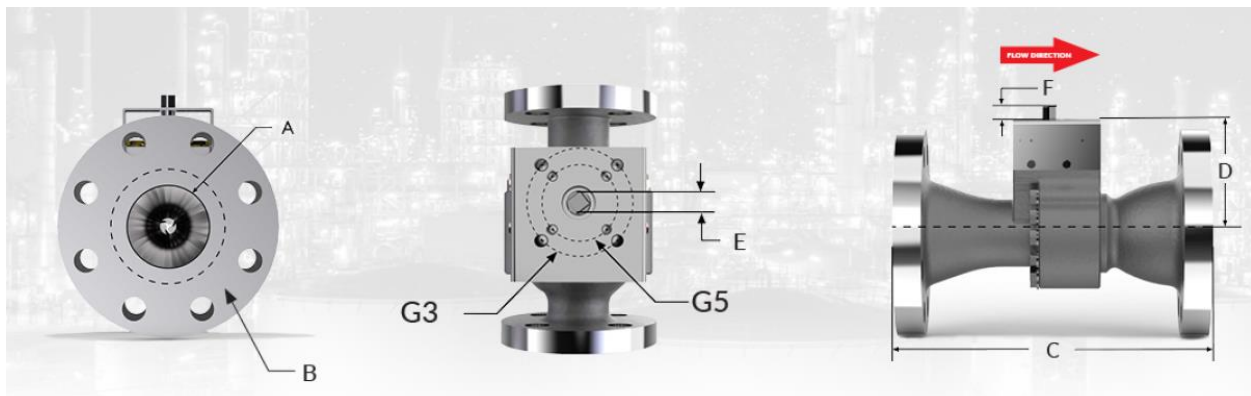
A		B	C	D	E	F	G	H	I
ASME B16.5 [NPS]		PRESSURE CLASS	ISA 75.08 [IN]	[IN]	DRIVE SQUARE WIDTH [IN]	DRIVE SQUARE HEIGHT [IN]	ISO 5211 Yoke PATTERN [in]	WEIGHT [lbs]	MAST [in-lbs]
NPT Only	0.25"	CL600	3.15	2.73	0.433	0.684	F3 – 1.417 F5 – 1.970	5	67
	0.5"	CL1500	3.15						
1"		CL150	7.25					9	
		CL300	7.75					12	
		CL600	8.25	13					
		CL1500	11.5	25					



CV2 Reference Image

Table 16: CV20 Dilating Disk™ Valve Dimensions & Weight

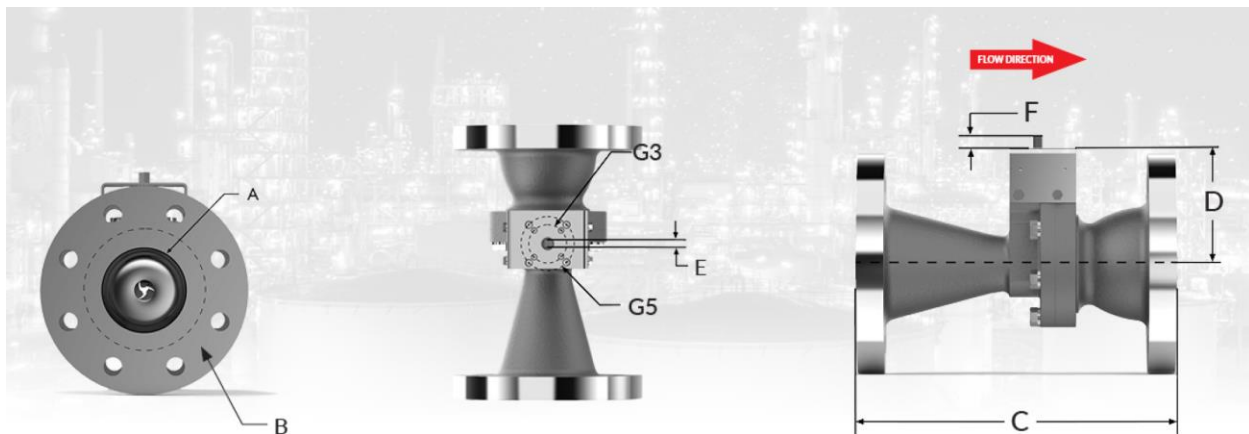
A	B	C	D	E	F	G	H	I
ASME B16.5 [NPS]	PRESSURE CLASS	ISA 75.08 [IN]	[IN]	DRIVE SQUARE [IN]	DRIVE ENGAGEMENT [IN]	ISO 5211 YOKE PATTERN [IN]	WEIGHT [LBS]	MAST [IN-LBS]
0.5"	CL150	7.25	4.515	0.433	0.535	F5 - 1.970 F7 - 2.760	19	1656
	CL300	7.50					20	
	CL600	8.00					21	
	CL900	10.75					42	
	CL1500	10.75					42	
0.75"	CL150	7.25					20	
	CL300	7.62					22	
	CL600	8.12					23	
	CL900	10.75					45	
	CL1500	10.75					45	
1"	CL150	7.25					21	
	CL300	7.75					24	
	CL600	8.25					25	
	CL900	10.75					50	
	CL1500	10.75					50	
1.5"	CL150	8.75	26					
	CL300	9.25	31					
	CL600	9.88	33					
	CL900	12.25	84					
	CL1500	12.25	84					
2"	CL150	10.00	32					
	CL300	10.50	36					
	CL600	11.25	39					
	CL900	14.75	84					
	CL1500	14.75	84					
3"	CL150	11.75	45					
	CL300	12.50	53					
	CL600	13.25	59					
	CL900	17.38	105					
	CL1500	18.12	129					



CV20 Reference Image

Table 17: CV71 Dilating Disk™ Valve Dimensions & Weight

A	B	C	D	E	F	G	H	I
ASME B16.5 [NPS]	PRESSURE CLASS	ISA 75.08 [IN]	[IN]	DRIVE SQUARE WIDTH [IN]	DRIVE SQUARE HEIGHT [IN]	ISO 5211 YOKE PATTERN [IN]	WEIGHT [LBS]	MAST [IN-LBS]
1 1/2"	CL150	8.75	5.23	0.433	0.584	F5 - 1.97 F7 - 2.76	31	1522
	CL300	9.25					36	
	CL600	9.88					46	
	CL900	13.12					81	
	CL1500	13.12					81	
2"	CL150	10.00					35	
	CL300	10.50					39	
	CL600	11.25					52	
	CL900	14.75					103	
	CL1500	14.75					103	
3"	CL150	11.75					48	
	CL300	12.50					57	
	CL600	13.25					73	
	CL900	17.38					103	
	CL1500	18.12					149	
4"	CL150	13.88	62					
	CL300	14.50	80					
	CL600	15.50	117					
	CL900	20.12	147					
	CL1500	20.87	205					
6"	CL300	18.62	128					



CV71 Reference Image

Table 18: CV308 Dilating Disk™ Valve Dimensions & Weight

A	B	C	D	E	F	G	H	I
ASME B16.5 [NPS]	PRESSURE CLASS	ISA 75.08 [IN]	[IN]	DRIVE SQUARE WIDTH [IN]	DRIVE SQUARE HEIGHT [IN]	ISO 5211 YOKE PATTERN [IN]	WEIGHT [LBS]	MAST [IN-LBS]
3"	CL150	11.75	8.027	0.55	0.574	F5- 1.970 F7- 2.760 F10- 4.016	87	2566
	CL300	12.50					100	
	CL600	13.25					127	
4"	CL150	13.88					99	
	CL300	14.50					122	
	CL600	15.50					170	
6"	CL150	17.75					131	
	CL300	18.62					172	
	CL600	20.00					248	

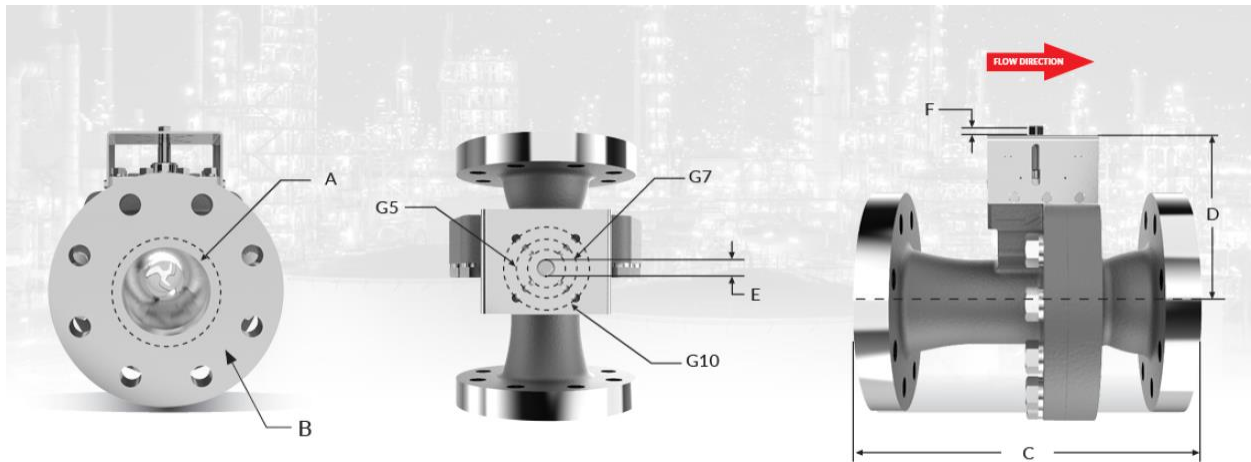
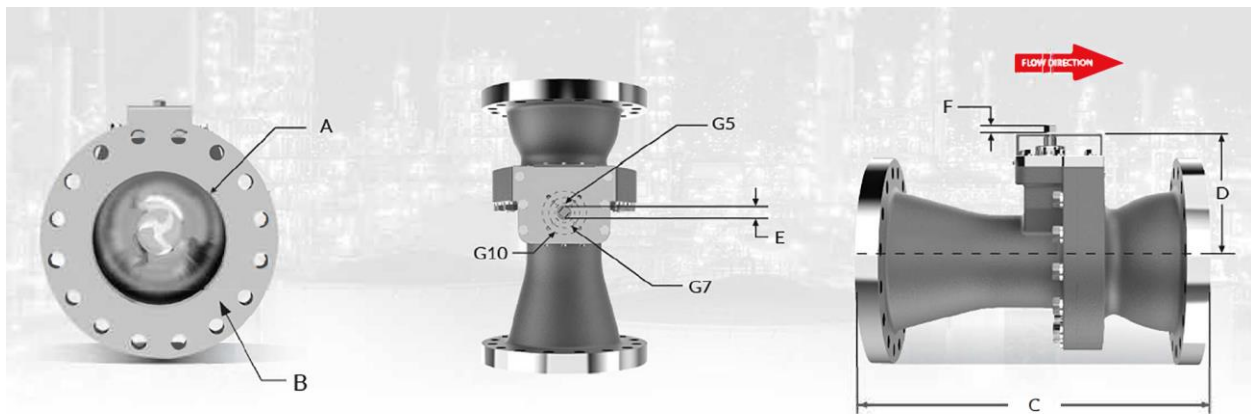

CV308 Reference Image

Table 19: CV1345 Dilating Disk™ Valve Dimensions & Weight

A	B	C	D	E	F	G	H	I
ASME B16.5 [NPS]	PRESSURE CLASS	ISA 75.08 [IN]	[IN]	DRIVE SQUARE WIDTH [IN]	DRIVE SQUARE HEIGHT [IN]	ISO 5211 YOKE PATTERN [IN]	WEIGHT [LBS]	MAST [IN-LBS]
6	CL150	17.75	10.827	0.866	0.700	F5- 1.970 F7- 2.760 F10- 4.016	312	8641
	CL300	18.62					361	
	CL600	20.00					443	
8	CL150	21.38					370	
	CL300	22.38					441	
	CL600	24.00					535	
10	CL150	26.50					458	
	CL300	27.88					551	
	CL600	32.25					717	
12	CL150	29.00					542	
	CL300	30.50					665	
	CL600	32.25					819	



CV1345 Reference Image

For more information about Clarke Valve, please visit the company website at:

<http://www.clarkevalve.com/>

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