



STANDARDS

- Valve design: ASME B16.34
- Material certification: EN10204-3.1 MTR
- End connections: ASME B16.11, ASME B1.20.1, ASME B16.25
- Steel casting: MSS SP-55
- Valve marking: MSS SP-25
- Direct mount: ISO 5211
- Face to face: ASME B16.10
- Class / Pressure Rating: Class 600
- Sulfide stress cracking: NACE MR-01-75

DM4600 / OBDM4600 Series

Three Piece Direct Mount Ball Valves

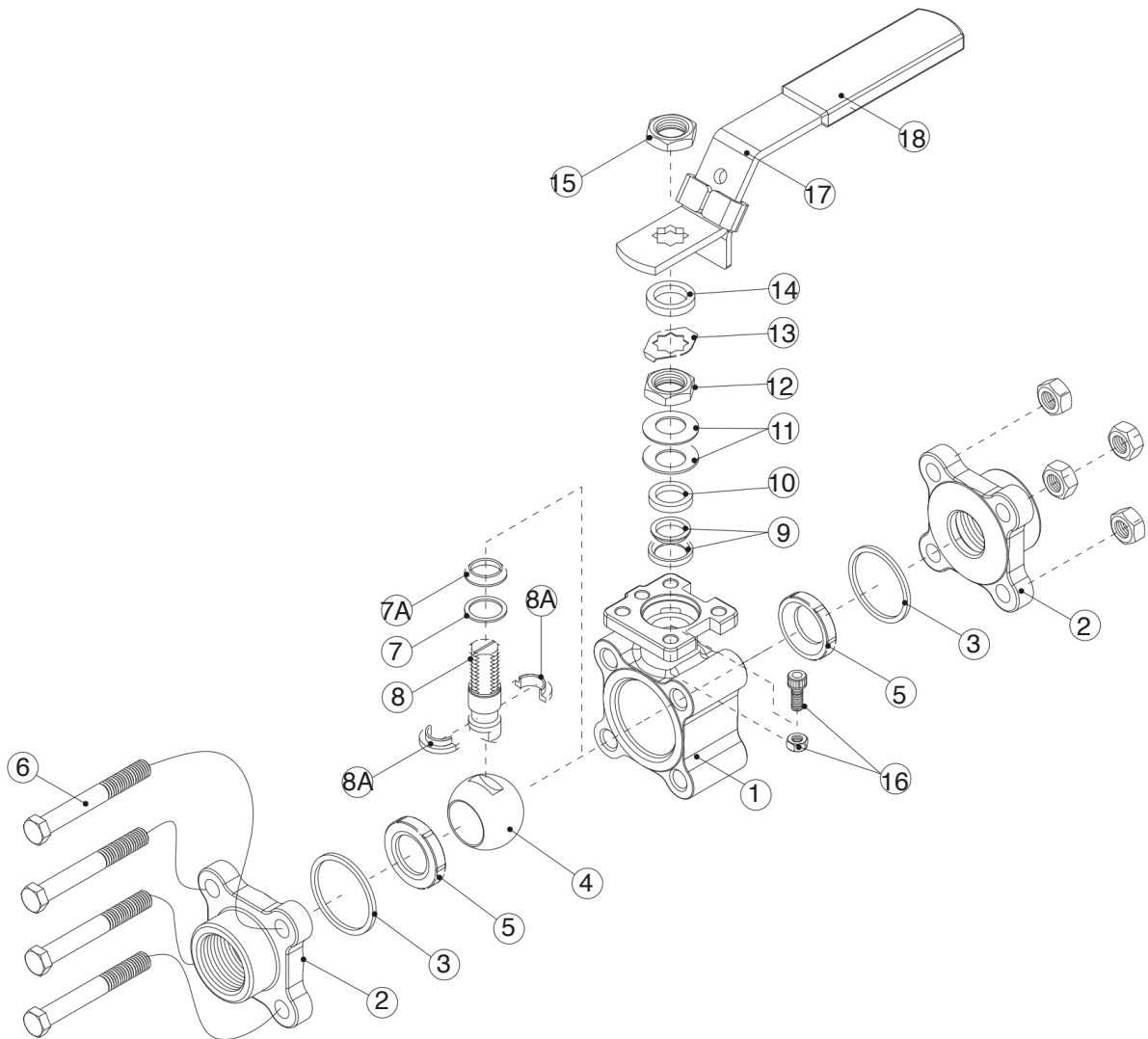
FEATURES & BENEFITS

- Body and end caps quality investment casting
- With ISO 5211 mounting pad
- With locking function
- Adjustable Stem Packing
- Standard in Stainless Steel or Carbon Steel
- Blow-out proof stem design
- 100% air tested under water at 100 psi
- Working pressure of 2160 psi
- Temperature range of -320°F to 800°F
- End type: butt weld, flanged, socket weld and threaded

OPTIONS

- Spring return (dead-man) handle
- Extended stem for isolation
- V-Ball for control valve in 15°, 30°, 60°, 90°, slot or custom
- Automation applicable
- Fugitive emissions bonnet
- PTFE / PFA coating (40-70 um)
- Alloy 20 / Monel / Hastelloy C276 / Titanium / Duplex 2507
- Cryogenic valve

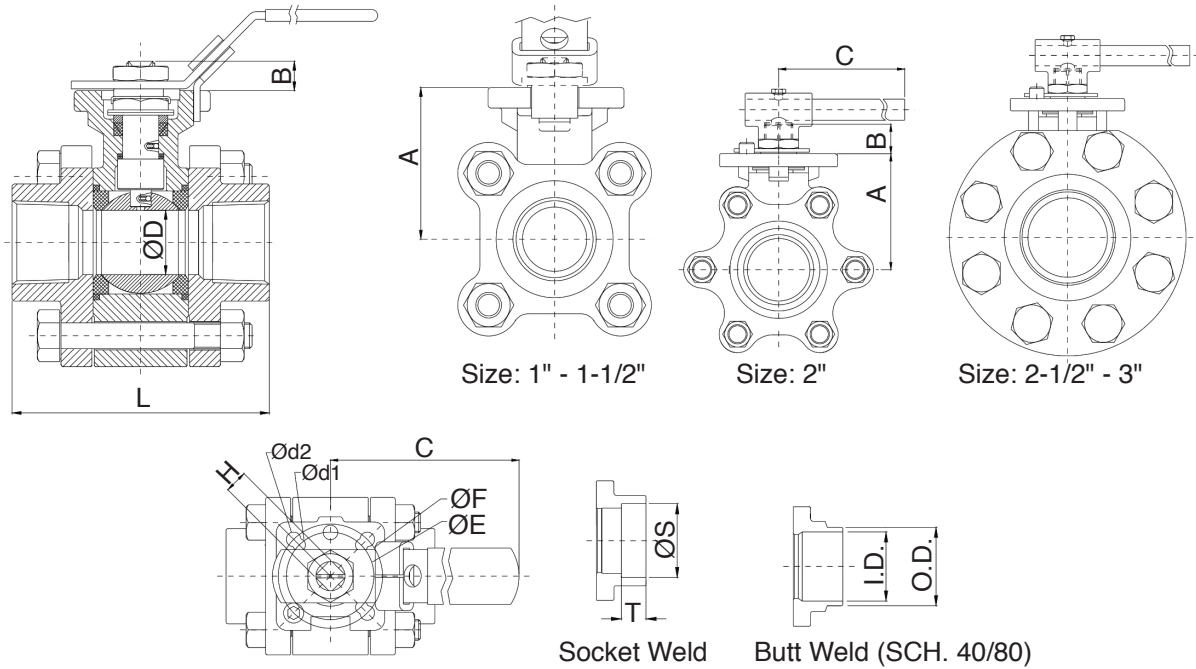
BILL OF MATERIALS



No	Part Name	Materials	No	Part Name	Materials
1	Body	CF8M/WCB	9	Stem Packing	TFM
2	End Cap	CF8M/WCB	10	Gland Washer	SS304
3	Gasket (Body)	TFM	11	Disk Washer	SS301
4	Ball	SS316	12	Stem Nut	SS304
5	Ball Seats	TFM / TCC / PEEK	13	Nut Stop	SS304
6	Bolts	SS304	14	Space Washer	SS304
7	Thrust Washer	TFM	15	Handle Nut	SS304
7A	Thrust Washer	PEEK	16	Stop Pin	SS304
8	Stem	SS316	17	Handle	SS304
8A	Half Split Ring	SS316	18	Handle Cover	Plastic

DM4600 Series Ball Valves

DIMENSIONS



Size	A	B	C	D	d1	d2	E	F	H	L
1/4"	1.81	0.37	5.12	0.43	0.24	0.24	1.42	1.65	0.35	2.62
3/8"	1.81	0.37	5.12	0.49	0.24	0.24	1.42	1.65	0.35	2.62
1/2"	1.89	0.37	5.12	0.59	0.24	0.24	1.42	1.65	0.35	2.76
3/4"	2.09	0.47	6.10	0.79	0.24	0.24	1.65	1.97	0.43	3.62
1"	2.32	0.47	6.10	0.98	0.24	0.28	1.65	1.97	0.43	4.13
1-1/4"	2.44	0.57	8.07	1.26	0.28	0.36	1.97	2.76	0.55	4.37
1-1/2"	2.76	0.57	8.07	1.50	0.28	0.36	1.97	2.76	0.55	4.88
2"	3.54	0.75	12.60	1.97	0.36	0.45	2.76	4.02	0.67	5.91
2-1/2"	4.13	0.71	13.78	2.50	0.36	0.45	2.76	4.02	0.67	6.50
3"	4.69	0.98	20.47	3.07	0.45	0.53	4.02	4.92	0.67	7.68

Size	SW		BW (40#)		BW (80#, std)	
	S	T	OD	ID	OD	ID
1/4"	0.56	0.44	0.55	0.36	0.55	0.30
3/8"	0.69	0.44	0.67	0.50	0.67	0.43
1/2"	0.86	0.50	0.84	0.63	0.84	0.54
3/4"	1.07	0.56	1.05	0.81	1.05	0.74
1"	1.33	0.63	1.31	1.05	1.31	0.96
1-1/4"	1.67	0.69	1.66	1.38	1.66	1.28
1-1/2"	1.92	0.72	1.92	1.59	1.92	1.50
2"	2.41	0.84	2.41	2.06	2.41	1.94
2-1/2"	2.91	0.87	2.91	2.47	2.91	2.32
3"	3.54	1.00	3.54	3.07	3.54	2.90

BREAK-TORQUE VALUE (IN-LB AT 0 PSI)

Size	1/4"	3/8"	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"
Seat	TFM	TFM	TFM	TFM	TFM	TFM	TFM	TFM	DELRIN	DELRIN
Grease	71	71	106	133	159	221	416	735	1460	2213

Note 1: The greases J Flow Controls uses include lubricants and anti-seize that are both SILICONE-FREE

Note 2: J Flow Controls strongly suggests increasing the torque at least 30% - 40% for safety factor when mounting an actuator

FLOW COEFFICIENT (FULL PORT VALVE)

Size	Cv Factor
1/4"	8.5
3/8"	8.5
1/2"	21
3/4"	50
1"	90
1-1/4"	110
1-1/2"	240
2"	400
2-1/2"	700
3"	980

FLOW COEFFICIENT (Slotted Ball) 3/4" and Smaller

1/16" Slotted

% Open	Cv Factor
0	0
10	0.02
20	0.08
30	0.23
40	0.38
50	0.52
60	0.68
70	0.83
80	1
90	1.13
100	1.25

1/8" Slotted

% Open	Cv Factor
0	0
10	0.00
20	0.15
30	0.23
40	0.62
50	0.97
60	1.30
70	1.58
80	1.85
90	1.98
100	2.08

V-Control Ball Valve Flow Coefficient Cv Charts

Valve Size	V-Port Angle	Percent and Angle of Ball Rotation										
		0% 0°	10% 9°	20% 18°	30% 27°	40% 36°	50% 45°	60% 54°	70% 63°	80% 72°	90% 81°	100% 90°
1/2"	15°	0	0.04	0.17	0.43	0.68	0.98	1.62	2.09	2.84	3.61	4.18
1/2"	30°	0	0.04	0.23	0.47	0.77	1.19	1.83	2.47	3.43	4.65	5.55
1/2"	60°	0	0.04	0.28	0.73	1.11	1.83	2.92	4.29	7.00	9.43	12.78
1/2"	90°	0	0.06	0.47	0.85	1.28	2.05	3.24	4.74	8.26	11.61	14.72
3/4"	15°	0	0.05	0.20	0.51	0.88	1.30	2.13	2.75	3.74	4.75	5.51
3/4"	30°	0	0.07	0.30	0.61	0.99	1.57	2.42	3.25	4.52	6.12	7.30
3/4"	60°	0	0.07	0.35	0.93	1.46	2.42	3.85	5.64	9.21	12.41	16.25
3/4"	90°	0	0.08	0.59	1.11	1.69	2.69	4.27	6.24	10.85	15.28	19.37
1"	15°	0	0.06	0.30	0.93	1.49	2.31	3.75	4.67	6.47	8.46	9.84
1"	30°	0	0.08	0.45	1.25	2.06	3.54	5.30	7.70	10.49	12.84	15.48
1"	60°	0	0.09	0.68	1.74	2.78	5.13	8.00	11.88	18.71	23.22	32.81
1"	90°	0	0.11	0.93	2.78	5.09	7.74	12.20	17.33	24.48	26.79	43.89
1-1/4"	15°	0	0.03	0.27	0.83	1.64	2.78	4.07	5.88	7.99	10.81	12.82
1-1/4"	30°	0	0.05	0.48	1.37	2.47	4.12	6.08	8.82	11.76	14.87	17.37
1-1/4"	60°	0	0.07	0.67	2.04	3.41	6.47	10.80	15.39	22.35	33.37	43.45
1-1/4"	90°	0	0.08	0.78	2.92	5.41	10.23	17.28	19.48	34.93	51.76	65.81
1-1/2"	15°	0	0.05	0.37	1.15	2.26	3.82	5.59	8.08	10.99	14.86	17.62
1-1/2"	30°	0	0.07	0.65	1.88	3.39	5.66	8.36	12.12	16.17	20.44	23.88
1-1/2"	60°	0	0.09	0.92	2.81	4.69	8.89	14.85	21.16	30.73	45.88	59.74
1-1/2"	90°	0	0.10	1.07	4.01	7.44	14.06	23.76	26.78	48.03	71.17	90.49
2"	15°	0	0.06	0.69	2.23	4.45	7.24	10.68	15.38	21.39	28.75	34.69
2"	30°	0	0.09	1.18	3.79	7.53	12.26	17.83	26.44	36.45	48.09	55.85
2"	60°	0	0.11	1.51	5.80	10.39	20.60	33.98	48.75	69.04	104.23	135.75
2"	90°	0	0.16	1.89	7.28	13.58	25.38	42.30	55.56	87.04	129.75	167.34
2-1/2"	15°	0	0.07	0.77	2.40	5.23	8.06	11.73	16.42	22.31	27.24	31.30
2-1/2"	30°	0	0.09	1.15	4.42	7.91	13.39	20.05	30.43	41.92	69.75	76.95
2-1/2"	60°	0	0.13	1.46	5.91	11.90	23.24	37.92	59.31	83.29	113.65	162.50
2-1/2"	90°	0	0.17	1.83	7.29	16.45	31.16	53.53	77.89	118.29	177.32	239.45
3"	15°	0	0.08	0.89	2.96	6.65	9.58	13.42	19.47	26.67	31.79	38.31
3"	30°	0	0.12	1.20	4.15	9.49	15.96	26.78	38.91	53.31	69.77	85.91
3"	60°	0	0.15	2.89	6.70	15.82	29.36	46.32	73.60	106.74	149.88	193.20
3"	90°	0	0.20	4.12	8.65	21.09	41.09	69.27	105.91	161.04	237.23	359.21
4"	15°	0	0.11	1.40	3.73	8.86	16.76	27.91	41.85	59.24	75.49	96.37
4"	30°	0	0.16	1.75	7.84	18.59	35.21	58.60	87.89	124.41	158.53	196.35
4"	60°	0	0.26	2.20	12.44	33.67	62.98	106.26	160.49	233.96	329.50	437.29
4"	90°	0	0.35	4.37	19.68	50.29	91.83	157.43	240.51	365.15	546.62	830.86
6"	15°	0	0.20	2.50	6.64	15.77	29.85	49.70	74.54	105.51	134.44	171.62
6"	30°	0	0.29	3.12	13.97	33.11	62.70	104.37	156.53	221.56	282.33	349.69
6"	60°	0	0.46	5.41	22.15	59.97	112.16	189.24	285.82	416.68	586.83	800.80
6"	90°	0	0.66	7.79	35.05	89.56	163.55	280.37	428.34	650.32	973.50	1479.70
8"	15°	0	0.34	4.23	11.32	26.84	50.80	84.58	126.84	395.03	503.35	292.07
8"	30°	0	0.49	5.32	23.77	56.35	106.70	177.62	266.39	377.06	480.47	595.11
8"	60°	0	0.79	6.66	23.81	102.06	190.87	322.06	486.41	709.11	998.69	1325.38
8"	90°	0	1.05	13.26	59.64	152.42	278.33	477.14	728.96	1106.69	1656.77	2518.18
10"	15°	0	0.53	6.62	17.69	41.94	79.38	132.15	198.20	617.24	786.48	456.36
10"	30°	0	0.77	8.31	37.14	88.05	166.73	277.53	416.24	589.16	750.74	929.87
10"	60°	0	1.23	10.41	37.20	159.47	298.23	503.22	760.02	1107.99	1560.45	2070.90
10"	90°	0	1.64	20.72	93.20	238.16	434.90	745.53	1139.00	1729.20	2588.70	3934.65
12"	15°	0	0.74	9.26	24.76	58.72	111.13	185.01	277.47	864.13	1101.07	638.90
12"	30°	0	1.07	11.63	52.00	123.27	233.42	388.54	582.73	824.82	1051.03	1301.81
12"	60°	0	1.72	14.57	52.08	223.25	417.52	704.51	1064.03	1551.19	2184.63	2899.26
12"	90°	0	2.29	29.00	130.47	333.42	608.85	1043.74	1594.59	2420.88	3624.18	5508.51

OBDM4600 Series Ball Valves

FLOW COEFFICIENT 60 Degree V-Ball

Percent Open	Cv (60° V-Port)								
	NPS 1/2	NPS 3/4	NPS 1	NPS 1-1/4	NPS 1-1/2	NPS 2	NPS 2-1/2	NPS 3	NPS 4
100	6.07	6.8	15.11	24.53	37.4	61.51	92.16	117.22	191.72
90	5.47	6.12	13.59	22.08	33.66	55.36	82.94	105.5	172.55
80	4.86	5.44	12.08	19.62	29.92	49.21	73.73	93.78	153.38
70	4.25	4.76	10.57	17.17	26.18	43.05	64.51	82.06	134.21
60	3.65	4.08	9.06	14.71	22.44	36.9	55.29	70.33	115.03
50	3.04	3.4	7.55	12.26	18.7	30.75	46.08	58.61	95.86
40	2.43	2.72	6.04	9.81	14.96	24.6	36.86	46.89	76.69
30	1.82	2.04	4.53	7.36	11.22	18.45	27.65	33.54	57.52
20	1.22	1.36	2.62	4.91	7.48	12.3	18.43	23.44	38.34
10	0.61	0.68	1.51	2.45	3.74	6.15	9.22	11.72	19.17
Approx. Flow Char.	EP	EP	EP	EP	EP	EP	EP	EP	EP
Shut-off Angle	23.9°	12.6°	17.3°	16.3°	14.4°	10.3°	8.5°	12.6°	8.5°

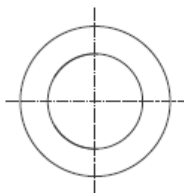
FLOW COEFFICIENT 90 Degree V-Ball

Percent Open	Cv (90° V-Port)								
	NPS 1/2	NPS 3/4	NPS 1	NPS 1-1/4	NPS 1-1/2	NPS 2	NPS 2-1/2	NPS 3	NPS 4
100	6.91	14.21	29.1	55.1	78.1	136	217.89	310.76	670.75
90	5.44	11.34	21.2	39.2	23.36	105.1	160.39	205.1	442.57
80	3.81	8.1	16.3	28.3	20.76	70.3	106.27	135.54	265.4
70	2.23	4.62	11.4	19	18.17	45	70.17	90.07	190.22
60	1.51	3.14	8.12	14.6	15.57	35	48.26	60.4	125.05
50	.91	2	5.1	8.53	12.98	22.09	27.88	35.83	75.87
40	.61	1.2	3.4	5.3	10.38	12.4	14.51	18.27	40.7
30	.43	.81	1.84	2.1	7.79	6.25	7.13	8.65	16.52
20	.2	.41	.61	.81	5.19	2.19	1.72	3.53	3.53
10	0.1	0.2	0.2	0.3	2.6	.52	.58	.7	1.1
Approx. Flow Char.	EP	EP	EP	EP	EP	EP	EP	EP	EP
Shut-off Angle	23.9°	12.6°	17.3°	16.3°	14.4°	10.3°	8.5°	12.6°	8.5°

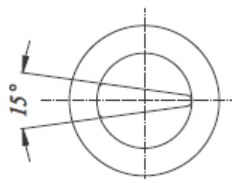
$K_v = 0.865 C_v$

$A_v = 24.0 \times 10^{-6} C_v$

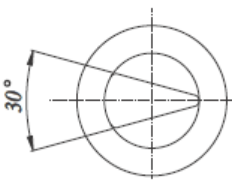
EP = Equal Percentage



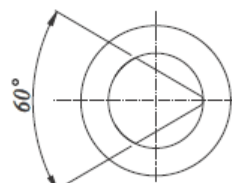
Straight Port



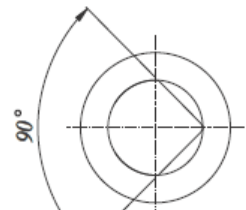
15° V-Port



30° V-Port



60° V-Port



90° V-Port

DM4600 Series Ball Valves

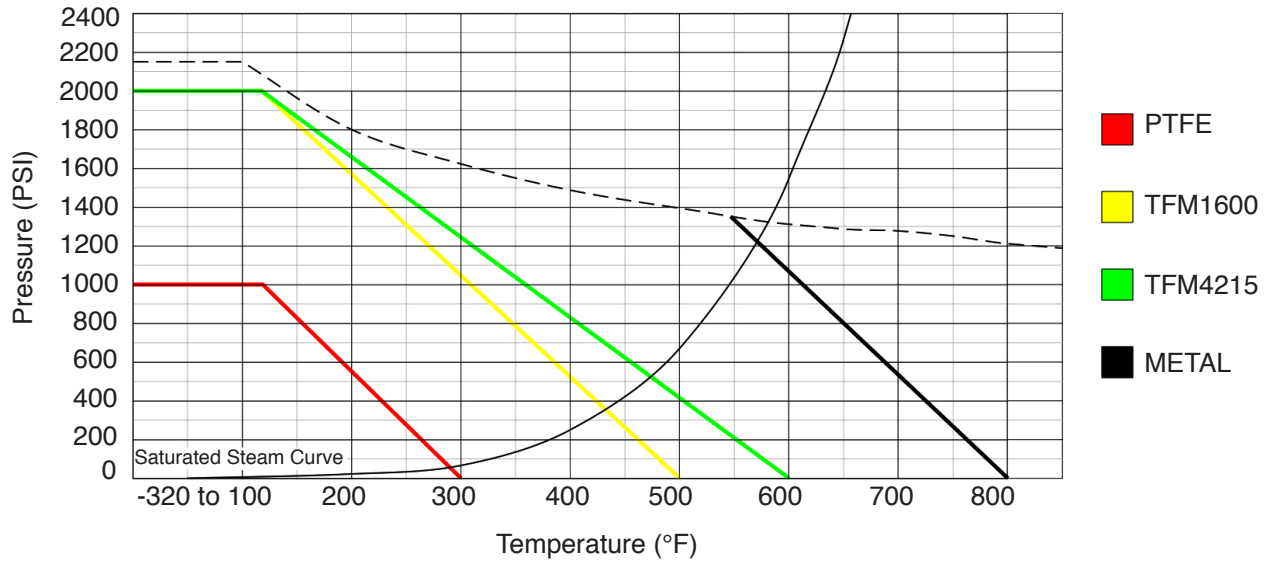
HOW TO ORDER

Series	Body ¹	Ball & Stem	Port	Packing/Body Seal Material	Seat
DM46	0 304	0 304	F Full Port	TM TFM1600	TM TFM1600
	0L 304L	0L 304L	15 15° V-Ball	TC TFM4215	TC TFM4215
	2 WCB/A015	3 316	30 30° V-Ball	GG Graphite	M3 CF8M
	3 316	4 Alloy 20	60 60° V-Ball		
	6L CF3M (316L)	5 Monel	90 90° V-Ball		
		6L CF3M (316L)			
		7 Hastelloy C276			
		8 Titanium			
		9 Duplex 2507			

¹ Please see the J Flow Controls Configurator for a full list of body materials

End Connections	Material Options	Design Options
F15 ANSI 150 RF Flange	NA Standard	NA Standard
F30 ANSI 300 RF Flange	BC TFM4215 Body Seal	
SCW Socket Weld	BG Graphite Body Seal	
FPT Female NPT		
W10 Butt Weld Sch 10		
W40 Butt Weld Sch 40		
W80 Butt Weld Sch 80		
E10 Extended Butt Weld Sch 10		
E40 Extended Butt Weld Sch 40		
E80 Extended Butt Weld Sch 80		
E16 Extended Butt Weld Sch 160		
FSW Female NPT X Socket Weld		
ESW Extended Socket Weld		

PRESSURE/TEMPERATURE CHART



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