KF Global Ball Valves

KF Industries

Superior Fluid Control Products for the Petrochemical and Industrial Markets

A division of CIRCOR International, Inc.

Suzhou KF and CIRCOR's International Petrochemical Group

As globally sourced products were becoming more and more acceptable to the valve market, KF realized that to remain competitive and still offer quality products, it was prudent to develop an international manufacturing source in which we held ownership. Additionally, careful selection of independent international sources for valve products and materials has been accomplished. Having executed this strategic global sourcing plan, KF continues to offer competitively priced, high quality flow control products worthy of our hard-earned, historical reputation.

Contents

Specifications Conformance

KF global ball valves are designed, manufactured and tested in accordance with API, ANSI, ASME and B.S. requirements. The following list contains the most important applicable standards for ball valves. These valves may be produced in accordance with other international standards on request.

ANSI-American National Standard Institute	
B 16.5	Steel pipe flanges and flanged fittings.
B 16.10	Face-to-face and end-to-end dimensions of ferrous valves.
B 16.25	Butt welding ends.
B 16.34	Steel valves-flanged and butt welding ends.

API-American Petroleum Institute	
Spec. 6A	Specification for wellhead valves.
Spec. 6D	Specification for pipeline valves.
Spec. 6FA	Specification for fire testing of valves.
Std. 607	Fire test for soft seated quarter-turn valves.
Spec. Q1	Quality program.

BSI-British Standard Institute	
BS 5351	Steel Ball Valves
BS 5750	Steel Ball Valves
BS 6755	Testing of Valves

Canadian Standard Association	
CSA	Z245.15-01

ISO 9001-International Organization for Standardization	
ISO 9001	Quality systems-model for quality assurance in design, development, production, installation and servicing.

MSS-Manufactures Standardization Society	
SP-6	Standard finishes for contact faces of pipe flanges and connecting-end flanges of valves and fittings.
SP-25	Standard marking system for valves, fittings, flanges and unions.
SP-55	Quality standard for steel castings.

NACE-National Association of Corrosion Engineers	
MR0175	Sulfide stress cracking resistant metallic materials for oil field equipment.

Our Quality Commitment

To ensure Customer Satisfaction, KF establishes Quality as a priority and focuses on continual improvement through manufacturing its products right the first time.

We strive to continually improve our management system and processes to provide technologies that help customers worldwide use fluids safely and efficiently while improving everyday life.

Our mission is to create and deliver fluid control solutions by focusing the considerable talents of our employees to meet diverse customer and regulatory requirements worldwide.

Other additional non-destructive or destructive examination may be performed to customer requirements or specifications.

Series M3 Trunnion Mounted Ball Valves

A large trunnion design ensures central positioning under the highest working pressure. Independent floating spring loaded seats provide a tight seal even at low differential pressures. Service and maintenance is simplified with a bolted body design incorporating double O-rings or a combination of O-rings and gaskets, suitable for buried or above ground installation. Series M3 valves are offered in 2"FP-24"FP, ANSI classes 150, 300 and 600, 2"FP-16"FP class 900 and 2"FP-12"FP, class 1500.*

*Consult factory for sizes not shown.

General Design Features

- Three-piece body design
- Double block and bleed
- Trunnion supported design reduces operating torque
- Anti-static device for grounding of the ball, stem and body
- Two sets of O-rings plus firesafe stem packing prevents leakage
- Corrosion resistant low friction bearings
- Inconel seat springs
- Sealant injection fittings for emergency stem or seal sealing
- Direct mount top works pad for actuator or gear operator
- API Spec Q1 6A, 6D, 6FA and 607
- ASME Section III Div. 1-NCA 4000
- BS 5351, 5750 and 6755
- ISO 9001/9002
- CSA - Z245.15-01
- 8" & larger valves are equipped with lifting lugs
- Locking device (lock not included)
- NACE MR0175
- Anti-blowout trunnion stem design

Body & Trim Materials

Part	Material
Body/Adapter	A105, LF2, F316SS
Ball/Stem	F316SS or CS+3 mil ENP
Seat	Devlon, Teflon®, PEEK (HT4)

Pressure Rating (psig)

Material	ANSI Cl. 150	ANSI Cl. 300	ANSI Cl. 600	ANSI Cl. 900	ANSI Cl. 1500
A105, LF2	285	740	1480	2220	3705
F316	275	720	1440	2160	3600

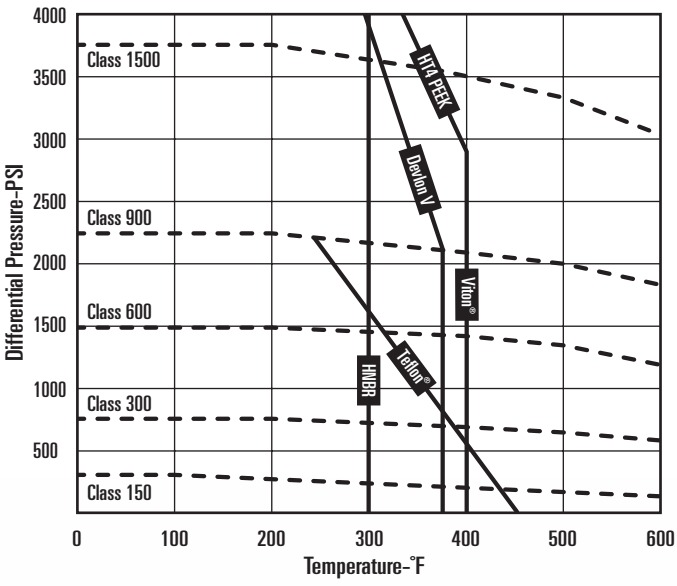
Low Temperature Limits

Body Material	°F	°C
A105	-20	-29
LF2	-50	-46
F316	-50	-46

Seat Material	°F	°C
Devlon V	-50	-46
HT4 (PEEK)	-50	-46
Teflon®	-50	-46

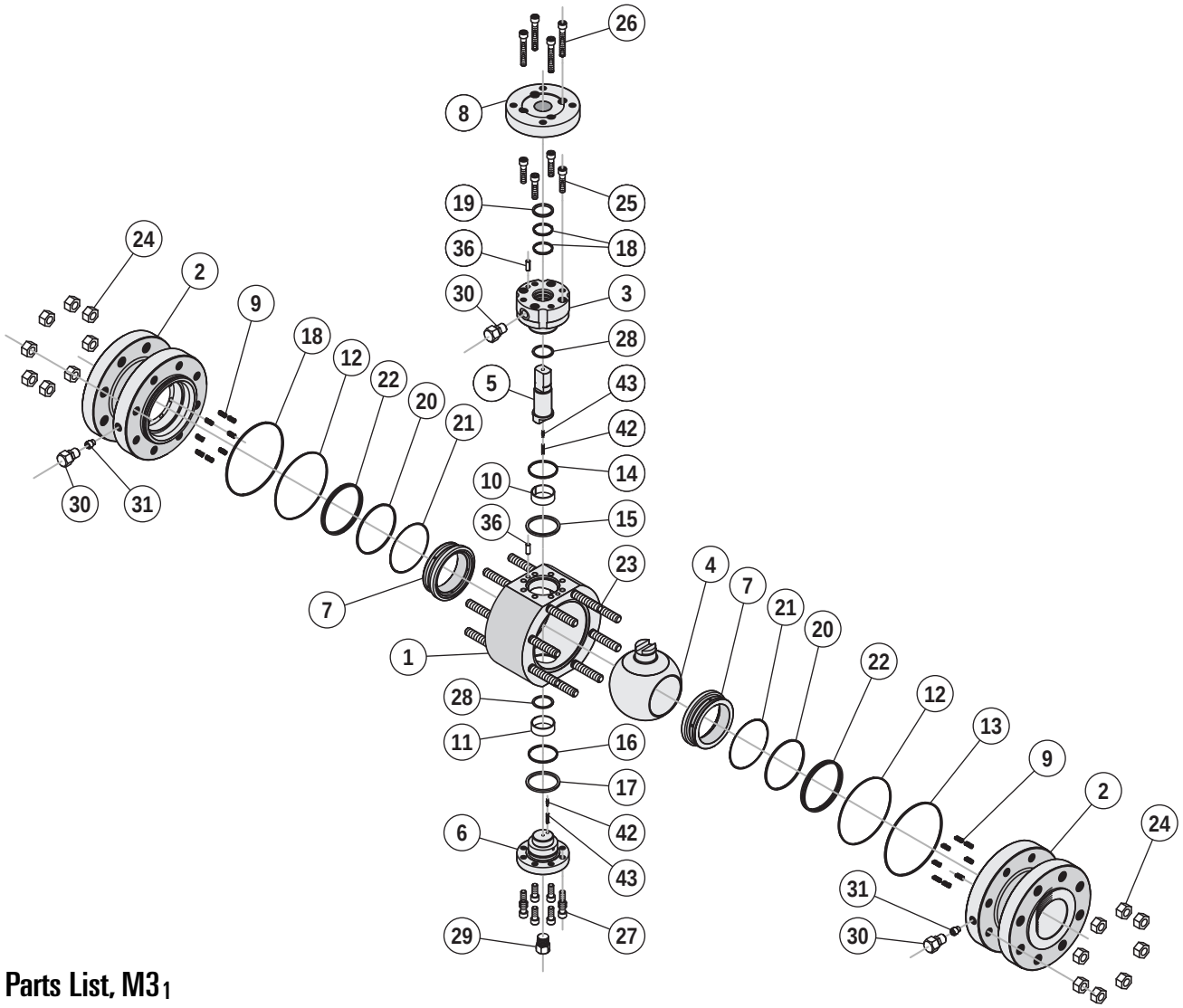
Seal Material	°F	°C
Viton®	-20	-29
HNBR	-40	-40

Pressure Temperature Chart**



**Teflon® not offered for Class 1500.

Series M3$_1$ • Component Parts • 2", 3" & 4" (All Classes)

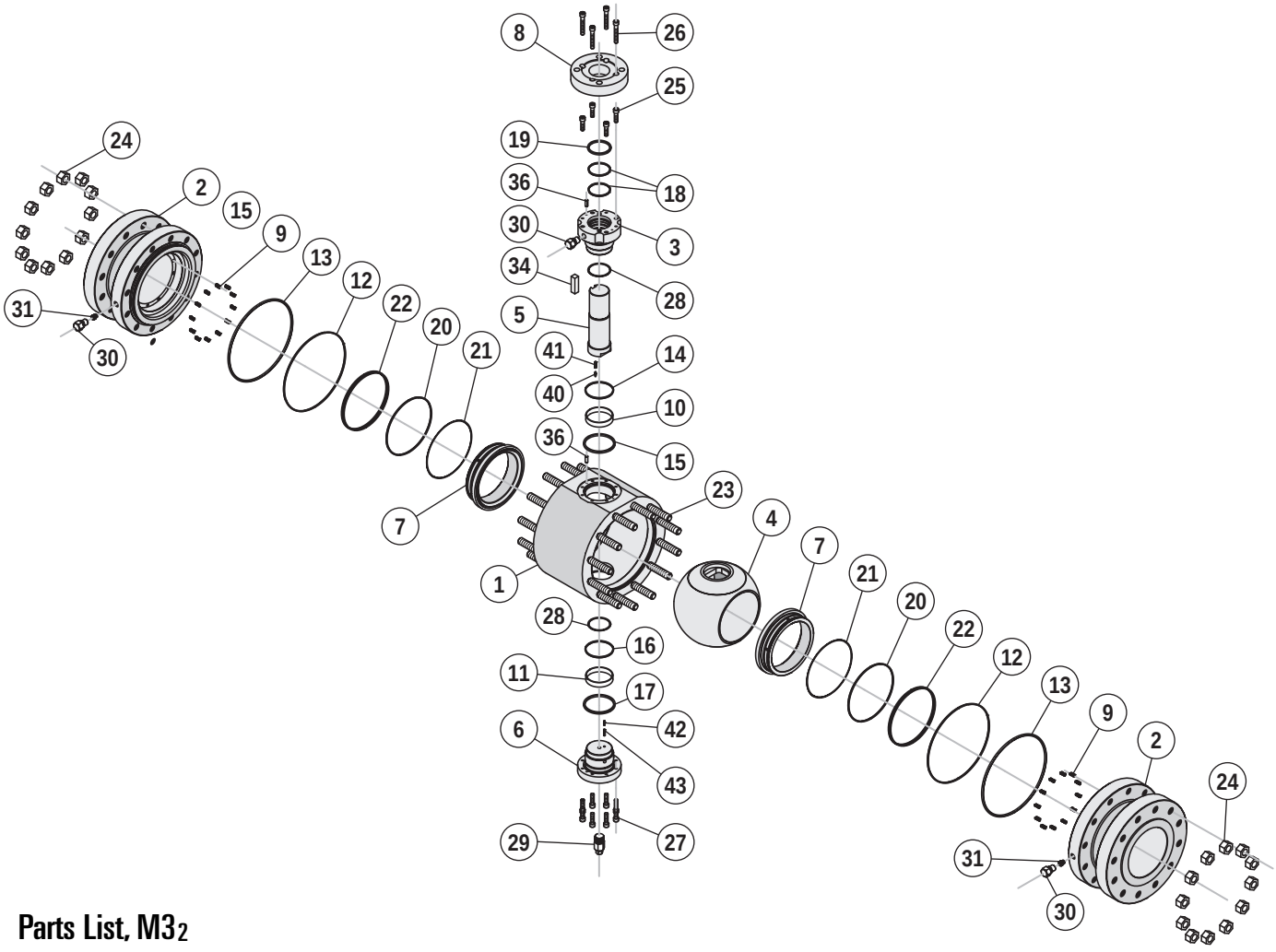


Parts List, M3$_1$

Part No.	Description
1	Body
2	Adapter
3	Bonnet
4	Ball
5	Stem
6	Lower Trunnion
7	Seat Assembly
8	Top Cover
9	Seat Springs
10	Stem Bearing
11	Lower Trunnion Bearing
12	Adapter Primary Seal
13	Adapter Sub-Seal
14	Bonnet Primary Seal
15	Bonnet Sub-Seal
16	Lower Trunnion Primary Seal
17	Lower Trunnion Sub-Seal
18	Stem Seal

Part No.	Description
19	Stem Sub-Seal
20	Seat Seal
21	Seat Seal Backup
22	Seat Sub-Seal
23	Stud, Body
24	Nut, Body
25	Cap Screw, Bonnet
26	Cap Screw, Top Cover
27	Cap Screw, Lower Trunnion
28	Thrust Bearing
29	Bleed/Drain Valve
30	Injection Fitting
31	Ball Check
32	Drain Plug
34	Key
36	Alignment Pin, Bonnet
42	Anti-Static Pin
43	Anti-Static Spring

Series M3$_2$ • Component Parts • 6"-12" (Class 150, 300 & 600)

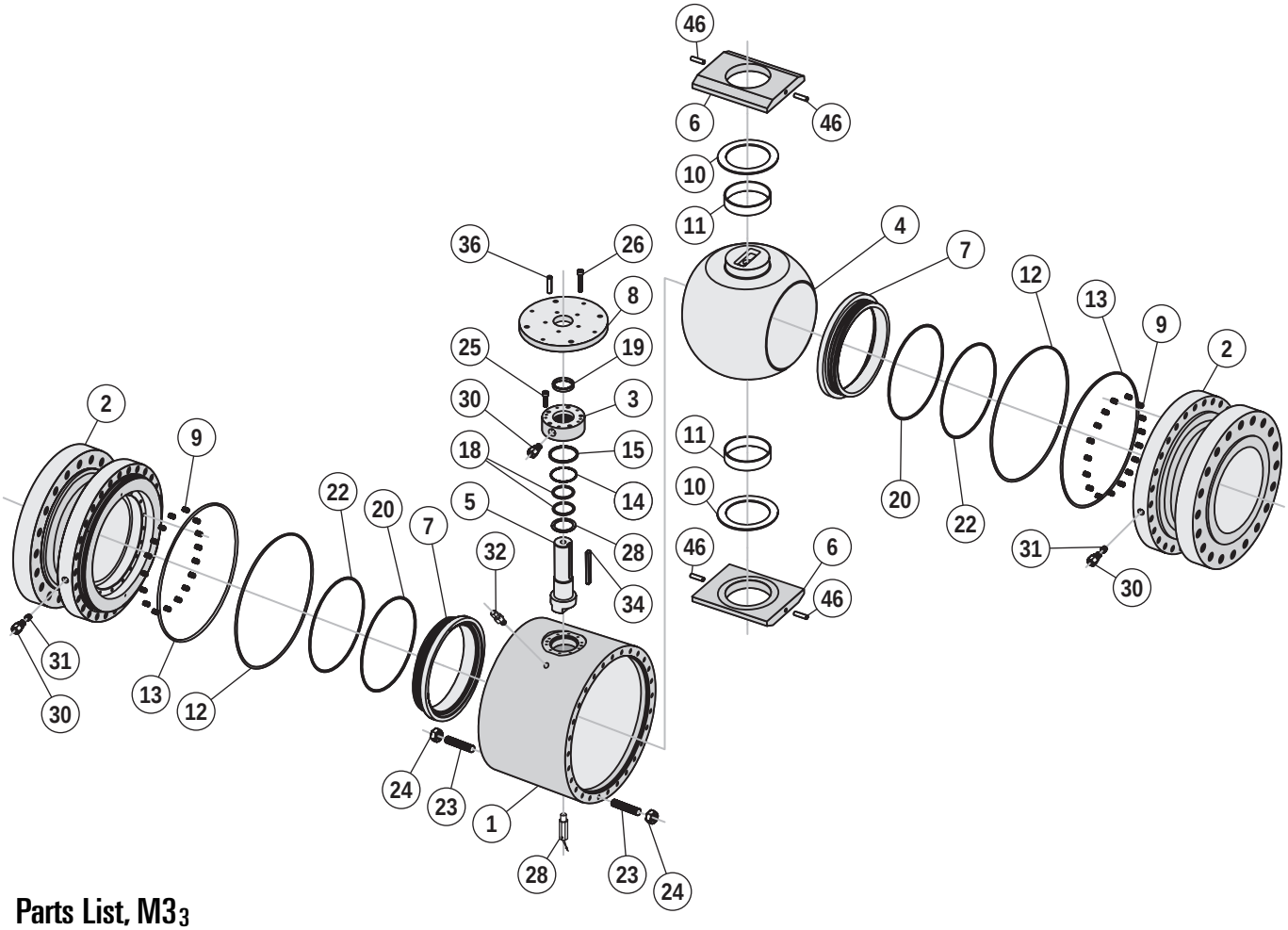


Parts List, M3$_2$

Part No.	Description
1	Body
2	Adapter
3	Bonnet
4	Ball
5	Stem
6	Lower Trunnion
7	Seat Assembly
8	Top Cover
9	Seat Springs
10	Stem Bearing
11	Lower Trunnion Bearing
12	Adapter Primary Seal
13	Adapter Sub-Seal
14	Bonnet Primary Seal
15	Bonnet Sub-Seal
16	Lower Trunnion Primary Seal
17	Lower Trunnion Sub-Seal
18	Stem Seal

Part No.	Description
19	Stem Sub-Seal
20	Seat Seal
21	Seat Seal Backup
22	Seat Sub-Seal
23	Stud, Body
24	Nut, Body
25	Cap Screw, Bonnet
26	Cap Screw, Top Cover
27	Cap Screw, Lower Trunnion
28	Thrust Bearing
29	Bleed/Drain Valve
30	Injection Fitting
31	Ball Check
32	Drain Plug
34	Key
36	Alignment Pin, Bonnet
42	Anti-Static Pin
43	Anti-Static Spring

Series M3$_3$ • Component Parts • 6"-12" (Class 900 & 1500)
14" & Larger (All Classes)

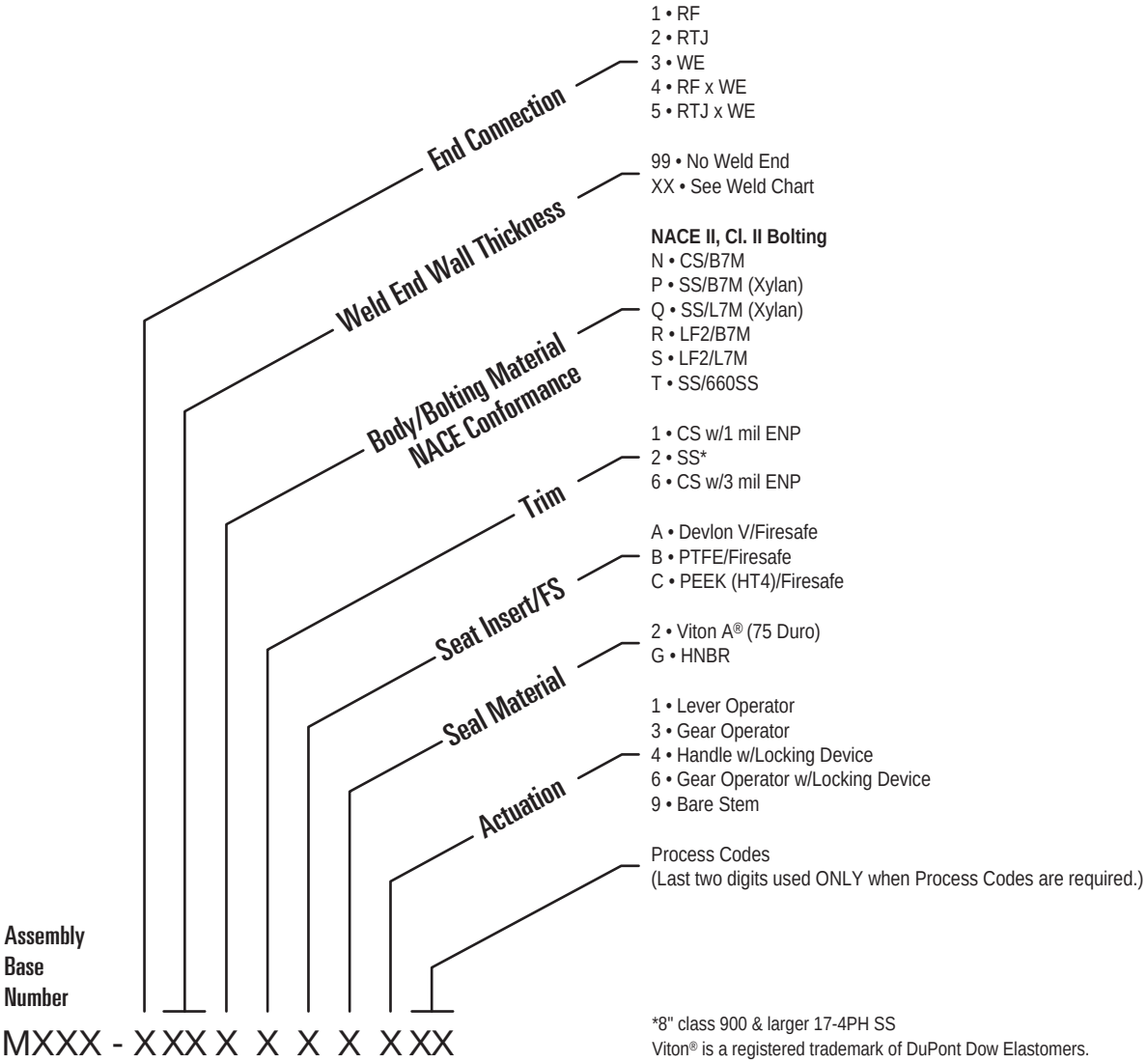


Parts List, M3$_3$

Part No.	Description
1	Body
2	Adapter
3	Bonnet
4	Ball
5	Stem
6	Trunnion Block
7	Seat Assembly
8	Top Cover
9	Seat Springs
10	Stem Bearing
11	Lower Trunnion Bearing
12	Adapter Primary Seal
13	Adapter Sub-Seal
14	Bonnet Primary Seal
15	Bonnet Sub-Seal
16	Lower Trunnion Primary Seal
17	Lower Trunnion Sub-Seal

Part No.	Description
18	Stem Seal
19	Stem Sub-Seal
20	Seat Seal
21	Seat Seal Backup
22	Seat Sub-Seal
23	Stud, Body
24	Nut, Body
25	Cap Screw, Bonnet
26	Cap Screw, Top Cover
28	Thrust Bearing
29	Bleed/Drain Valve
30	Injection Fitting
31	Ball Check
32	Drain Plug
34	Key
36	Alignment Pin, Bonnet
46	Trunnion Block Pin

Series M3 • Part Number Codes
2"FP-24"FP, Classes 150, 300, 600, 900 & 1500



*8" class 900 & larger 17-4PH SS
Viton® is a registered trademark of DuPont Dow Elastomers.

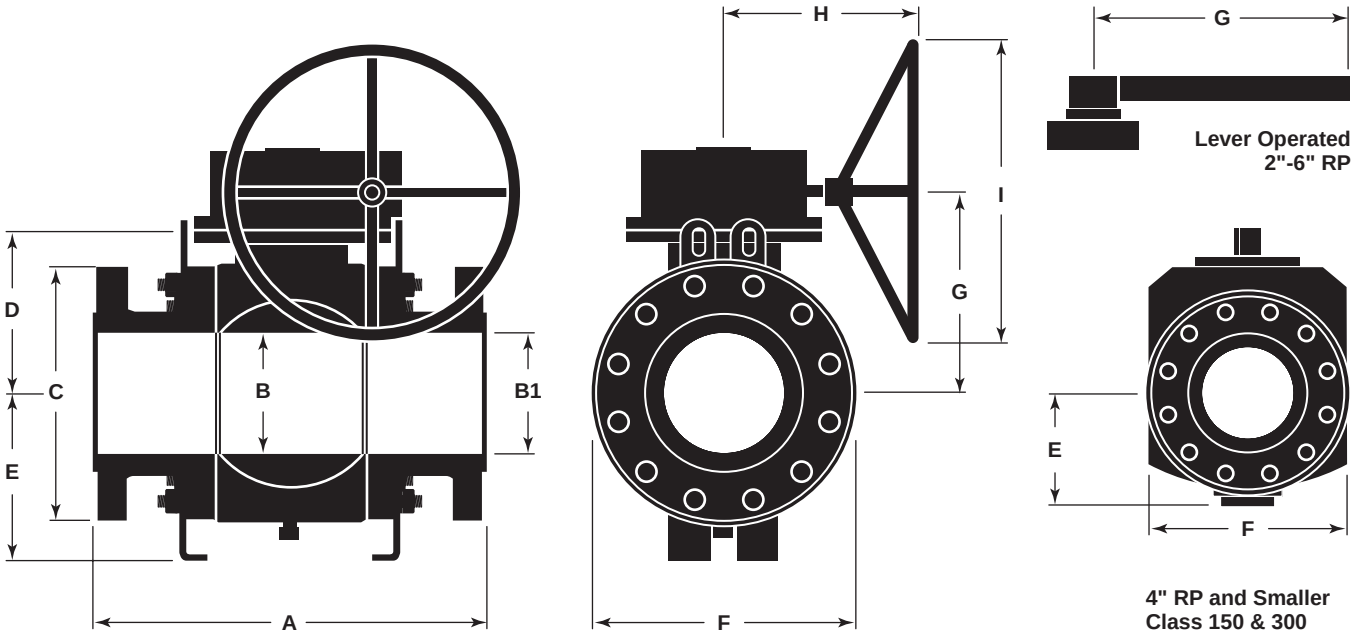
Series M3 Assembly Base Numbers, 2"FP–24"FP**

Class	Size (In.)											
	2FP	3RP	3FP	4RP	4FP	6RP	6FP	8RP	8FP	10RP	10FP	12RP
150	M111	M112	M113	M114	M115	M116	M117	M118	M119	M120	M121	M122
300	M211	M212	M213	M214	M215	M216	M217	M218	M219	M220	M221	M222
600	M311	M312	M313	M314	M315	M316	M317	M318	M319	M320	M321	M322
900	M411	M412	M413	M414	M415	M416	M417	M418	M419	M420	M421	M422
1500	M511	M512	M513	M514	M515	M516	M517	M518	M519	M520	M521	M522

Class	Size (In.)										
	12FP	14RP	14FP	16RP	16FP	18RP	18FP	20RP	20FP	24RP	24FP
150	M123	M124	M125	M126	M127	M128	M129	M130	M131	M134	M135
300	M223	M224	M225	M226	M227	M228	M229	M230	M231	M234	M235
600	M323	M324	M325	M326	M327	M328	M329	M330	M331	M334	M335
900	M423	M424	M425	M426	M427	M428	M429	M430	M431	M434	M435
1500	M523										

**Consult factory for sizes not shown.

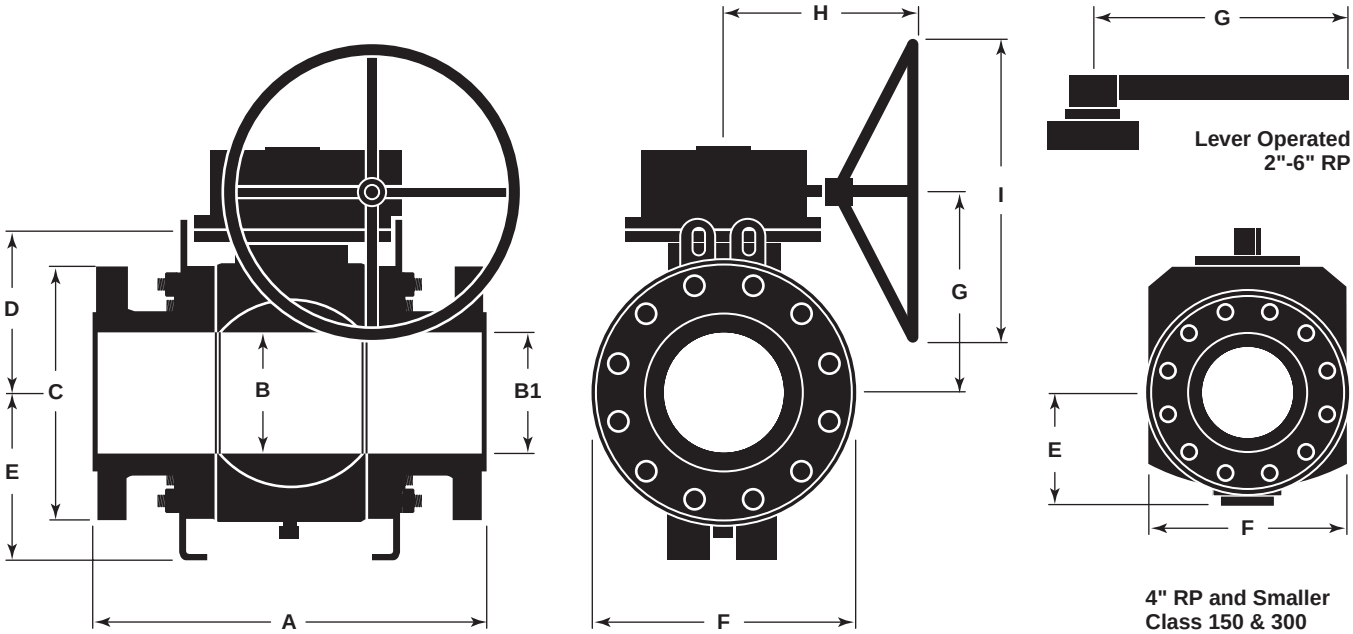
Series M3 Class 150 • Dimensional Data (in., mm)



Dimensional Data, 2"FP-24"FP, Class 150

Size (in.)	Dimension (in./mm)																							
	A						B		B1		C		D		E		F		G		H		I	
	RF		RTJ		WE																			
	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm
2	7	178	7.5	190	8.5	216	2	51	2	50	6	152.4	4.252	108	3.071	78	4.961	126	8.054	216	—	—	—	—
3 x 2	8	203	8.5	216	11.125	283	2	51	3	76.2	7.5	190.5	4.252	108	3.071	78	4.961	126	8.054	216	—	—	—	—
3	8	203	8.5	216	11.125	283	3	76.2	3	76.2	7.5	190.5	6.004	152.5	4.961	146	7.244	184	15	381	—	—	—	—
4 x 3	9	229	9.5	241	12	305	3	76.2	4	101.6	9	228.6	6.004	152.5	4.961	146	7.244	184	15	381	—	—	—	—
4	9	229	9.5	241	12	305	4	101.6	4	101.6	9	228.6	7.48	190	5.433	158	10.433	265	9.409	239	9.055	230	7.874	200
6 x 4	15.5	394	16	406	18	457	4	101.6	6	152.4	11	279.4	7.48	190	5.433	158	10.433	265	9.409	239	9.055	230	7.874	200
6	15.5	394	16	406	18	457	6	152.4	6	152.4	11	279.4	9.055	230	6.89	195	12.559	319	10.571	268.5	14.173	360	19.685	500
8 x 6	18	457	18.5	470	20.5	521	6	152.4	8	203.2	13.5	342.9	9.055	230	6.89	195	12.559	319	10.571	268.5	14.173	360	19.685	500
8	18	457	18.5	470	20.5	521	7.992	203	8	203.2	13.5	342.9	11.378	289	11.319	287.5	16.339	415	13.543	344	14.173	360	19.685	500
10 x 8	21	533	21.5	546	22	559	7.992	203	10	254	16	406.4	11.378	289	11.319	287.5	16.339	415	13.543	344	14.173	360	19.685	500
10	21	533	21.5	546	22	559	10	254	10	254	16	406.4	12.48	317	12.992	330	19.685	500	10.591	369	14.173	360	19.685	500
12 x 10	24	610	24.5	622	25	635	10	254	12	304.8	19	482.6	12.48	317	12.992	330	19.685	500	10.591	369	14.173	360	19.685	500
12	24	610	24.5	622	25	635	12	304.8	12	304.8	19	482.6	15.11	383.8	15.551	395	23.228	590	17.165	436	17.323	440	27.559	700
14 x 12	27	686	27.5	698	30	762	12	304.8	13.268	337	21	533.4	15.11	383.8	15.551	395	23.228	590	17.165	436	17.323	440	27.559	700
16 x 12	30	762	30.5	775	33	838	12	304.8	15.25	387	23.5	596.9	15.11	383.8	15.551	395	23.228	590	17.165	436	17.323	440	27.559	700
14	27	686	27.5	698	30	762	13.268	337	13.268	337	21	533.4	15.748	400	16.496	419	25.118	638	17.795	452	17.323	440	27.559	700
16	30	762	30.5	775	33	838	15.25	387.4	15.25	387	23.5	596.9	16.654	423	16.823	427.3	27.953	710	19.409	493	18.11	460	27.559	700
20 x 16	36	914	36.5	927	39	991	15.25	387.4	19.252	489	27.5	698.5	16.654	423	16.823	427.3	27.953	710	19.409	493	18.11	460	27.559	700
18	34	864	34.5	876	36	914	17.244	438	17.244	438	25	635	19.094	485	21.102	536	31.89	810	21.85	555	22.638	575	27.559	700
20	36	914	36.5	927	39	991	19.252	489	19.252	489	27.5	698.5	21.142	537	18.366	466.5	34.055	865	24.331	618	22.638	575	27.559	700
24 x 20	42	1067	42.5	1080	45	1143	19.252	489	23.268	591	32	812.8	21.142	537	18.366	466.5	34.055	865	24.331	618	22.638	575	27.559	700
24	42	1067	42.5	1080	45	1143	23.268	591	23.268	591	32	812.8	24.252	616	23.563	598.5	40.354	1025	27.756	705	22.795	579	27.559	700

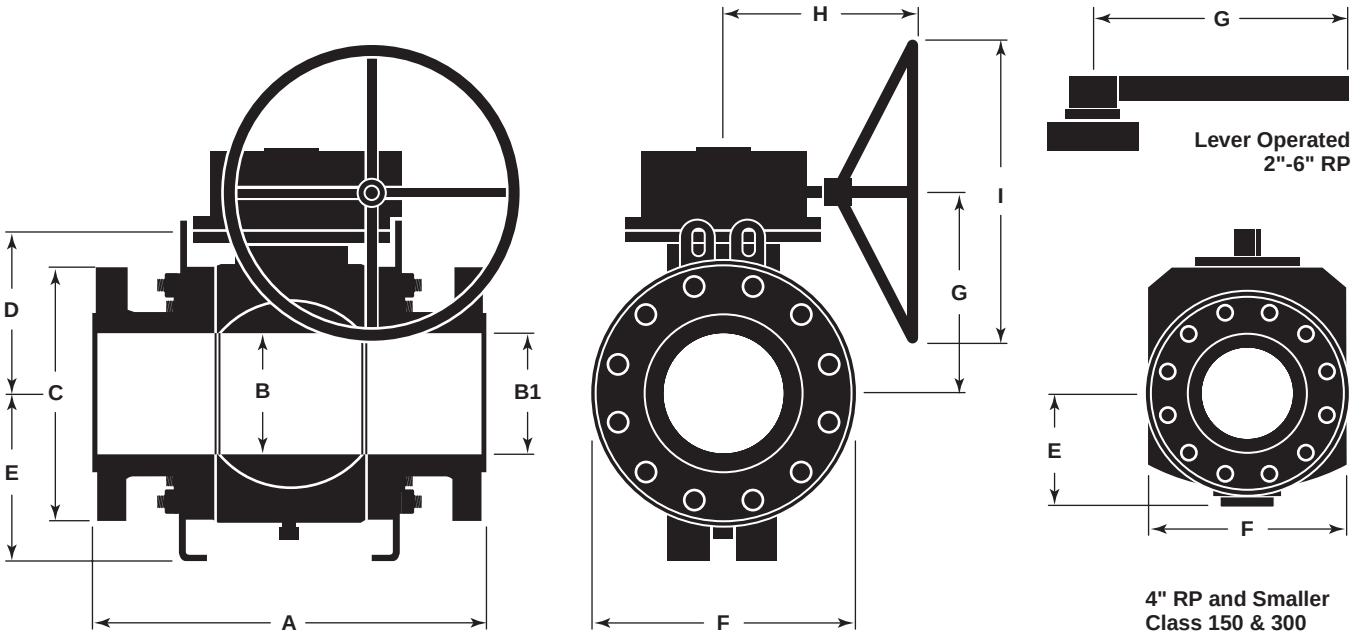
Series M3 Class 300 • Dimensional Data (in., mm)



Dimensional Data, 2"FP-24"FP, Class 300

Size (in.)	Dimension (in./mm)																							
	A						B		B1		C		D		E		F		G		H		I	
	RF		RTJ		WE																			
	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm
2	8 1/2	216	9 1/8	232	8 1/2	216	2	51	2	50.8	6.496	165	4.252	108	3.071	78	4.961	126	8.504	216	—	—	—	—
3x2	11 1/8	283	11 3/4	298	11 1/8	283	2	51	3	76.2	8.268	210	4.252	108	3.071	78	4.961	126	8.504	216	—	—	—	—
3	11 1/8	283	11 3/4	298	11 1/8	283	3	76.2	3	76.2	8.268	210	6.004	152.5	5.748	146	7.244	184	15	381	—	—	—	—
4x3	12	305	12 5/8	321	12	305	3	76.2	4	101.6	10	254	6.004	152.5	5.748	146	7.244	184	15	381	—	—	—	—
4	12	305	12 5/8	321	12	305	4	101.6	4	101.6	10	254	7.677	195	6.22	158	10.433	265	9.409	239	9.055	230	7.874	200
6x4	15 7/8	403	16 1/2	419	18	457	4	101.6	6	152.4	12.52	318	7.677	195	6.22	158	10.433	265	9.409	239	9.055	230	7.874	200
6	15 7/8	403	16 1/2	419	18	457	6	152.4	6	152.4	12.52	318	9.055	230	7.677	195	12.559	319	10.571	268.5	14.173	360	19.685	500
8x6	19 3/4	501.6	20 3/8	517	20 1/2	521	6	152.4	8	203.2	15	381	9.055	230	7.677	195	12.559	319	10.571	268.5	14.173	360	19.685	500
8	19 3/4	501.6	20 3/8	517	20 1/2	521	8	203	8	203.2	15	381	11.378	289	13.78	350	16.339	415	13.543	344	13.386	340	27.559	700
10x8	22 3/8	568	23	584	22	559	8	203	10	254	17.52	445	11.378	289	13.78	350	16.339	415	13.543	344	13.386	340	27.559	700
10	22 3/8	568	23	584	22	559	10	254	10	254	17.52	445	12.717	323	12.992	330	19.882	505	14.528	369	14.173	360	19.685	500
12x10	25 1/2	648	26 1/8	664	25	635	10	254	12	304.8	20.5	520.7	12.717	323	12.992	330	19.882	505	14.528	369	14.173	360	19.685	500
12	25 1/2	648	26 1/8	664	25	635	12	304.8	12	304.8	20.5	520.7	15.618	396.7	15.551	395	24.213	615	17.165	436	17.323	440	27.559	700
14 x12	30	762	30 5/8	778	30	762	12	304.8	13.268	337	22.992	584	15.618	396.7	15.551	395	24.213	615	17.165	436	17.323	440	27.559	700
16x12	33	838	33 5/8	854	33	838	12	304.8	15.252	387.4	25.512	648	15.618	396.7	15.551	395	24.213	615	17.165	436	17.323	440	27.559	700
14	30	762	30 5/8	778	30	762	13.268	337	13.268	337	22.992	584	15.748	400	16.496	419	25.118	638	17.795	452	17.323	440	27.559	700
16	33	738	33 5/8	854	33	838	15.252	387.4	15.252	387.4	25.512	648	16.654	423	16.823	427.3	27.953	710	19.409	493	18.11	460	27.559	700
20x16	39	991	39 3/4	991	39	1010	15.252	387.4	19.252	489	30.512	775	16.654	423	16.823	427.3	27.953	710	19.409	493	18.11	460	27.559	700
18	36	914	36 5/8	914	36	930	17.244	438	17.244	438	27.992	711	19.213	488	21.102	536	32.283	820	21.85	555	22.638	575	27.559	700
20	39	991	39 3/4	991	39	1010	19.252	489	19.252	489	30.512	775	21.339	542	18.366	466.5	34.409	874	24.331	618	22.638	575	27.559	700
24x20	45	1143	43 7/8	1143	45	1165	19.252	489	26.268	591	35.984	914	21.339	542	18.366	466.5	34.409	874	24.331	618	22.638	575	27.559	700
24	45	1143	43 7/8	1143	45	1165	23.268	591	26.268	591	35.984	914	24.567	624	23.563	598.5	40.945	1040	27.756	705	22.795	575	27.559	700

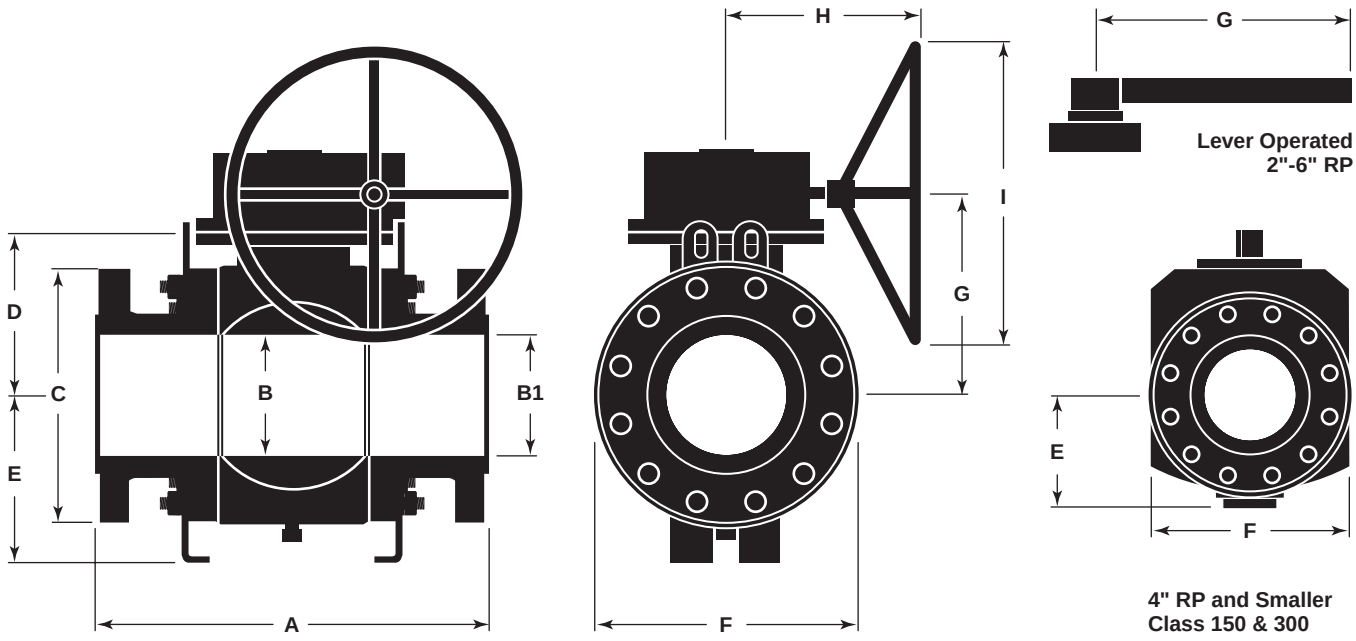
Series M3 Class 600 • Dimensional Data (in., mm)



Dimensional Data, 2"FP-24"FP, Class 600

Size (in.)	Dimension (in./mm)																							
	A						B		B1		C		D		E		F		G		H		I	
	RF		RTJ		WE																			
	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm
2	11.496	292	11.625	295	11.496	292	2	51	2	51	6.496	165	6.102	155	4.134	105	6.496	165	23.622	600	—	—	—	—
3x2	14.016	356	14.125	359	14.016	356	2	51	3	76.2	8.268	210	6.102	155	4.134	105	6.496	165	23.622	600	—	—	—	—
3	14.016	356	14.125	359	14.016	356	3	76.2	3	76.2	8.268	210	6.693	170	5.315	135	9.016	229	27.559	700	—	—	—	—
4x3	17.008	432	17.125	435	17.008	432	3	76.2	4	101.6	10.748	273	6.693	170	5.315	135	9.016	229	27.559	700	—	—	—	—
4	17.008	432	17.125	435	17.008	432	4	101.6	4	101.6	10.748	273	7.756	197	6.142	156	10.394	264	39.37	1000	—	—	—	—
6x4	22.008	559	22.125	562	22.008	559	4	101.6	6	152.4	14.016	356	7.756	197	6.142	156	10.394	264	39.37	1000	—	—	—	—
6	22.008	559	22.125	562	22.008	559	6	152.4	6	152.4	14.016	356	9.055	230	7.677	195	12.559	319	8.268	210	13.386	340	19.685	500
8x6	25.984	660	26.125	664	25.984	660	6	152.4	8	203.2	16.496	419	9.055	230	7.677	195	12.559	319	8.268	210	13.386	340	19.685	500
8	25.984	660	26.125	664	25.984	660	8	203	8	203.2	16.496	419	11.437	290.5	11.654	296	17.008	432	13.484	342.5	13.386	340	27.559	700
10x8	30.984	787	31.125	791	30.984	787	8	203	10	254	20	508	11.437	290.5	11.654	296	17.008	432	13.484	342.5	13.386	340	27.559	700
10	30.984	787	31.125	791	30.984	787	10	254	10	254	20	508	9.921	252	13.346	339	20.394	518	11.89	302	21.457	545	27.756	705
12x10	32.992	838	33.125	841	32.992	838	10	254	12	304.8	22.008	559	9.921	252	13.346	339	20.394	518	11.89	302	21.457	545	27.756	705
12	32.992	838	33.125	841	32.992	838	12	304.8	12	304.8	22.008	559	15.945	405	16.181	411	24.488	622	19.134	486	21.457	545	27.559	700
14 x12	35	889	35.125	892	35	889	12	304.8	13.268	337	23.74	603	15.945	405	16.181	411	24.488	622	19.134	486	21.457	545	27.559	700
16x12	39.016	991	39.125	994	39.016	991	12	304.8	15.252	387.4	27.008	686	15.945	405	16.181	411	24.488	622	19.134	486	21.457	545	27.559	700
14	35	889	35.125	892	35	889	13.268	337	13.268	337	23.74	603	15.748	400	16.496	419	25.118	638	18.701	475	22.638	575	27.559	700
16	39.016	991	39.125	994	39.016	991	15.252	387.4	15.252	387.4	27.008	686	17.441	443	18.425	468	28.937	735	20.63	524	22.638	575	27.559	700
20x16	47.008	1194	47.25	1200	47.008	1194	15.252	387.4	19.252	489	32.087	815	17.441	443	18.425	468	28.937	735	20.63	524	22.638	575	27.559	700
18	42.992	1092	43.125	1095	42.992	1092	17.244	438	17.244	438	29.252	746	19.606	498	20.827	529	33.071	840	23.11	587	22.785	579	27.559	700
20	47.008	1194	47.25	1200	47.008	1194	19.252	489	19.252	489	32.087	815	22.244	565	21.457	545	36.22	920	26.969	685	26.378	670	27.559	700
24x20	55	1397	55.375	1407	55	1397	19.252	489	23.268	591	37.008	940	22.244	565	21.457	545	36.22	920	26.969	685	26.378	670	27.559	700
24	55	1397	55.375	1407	55	1397	23.268	591	23.268	591	37.008	940	28.858	733	23.819	605	41.732	1060	—	—	—	—	—	—

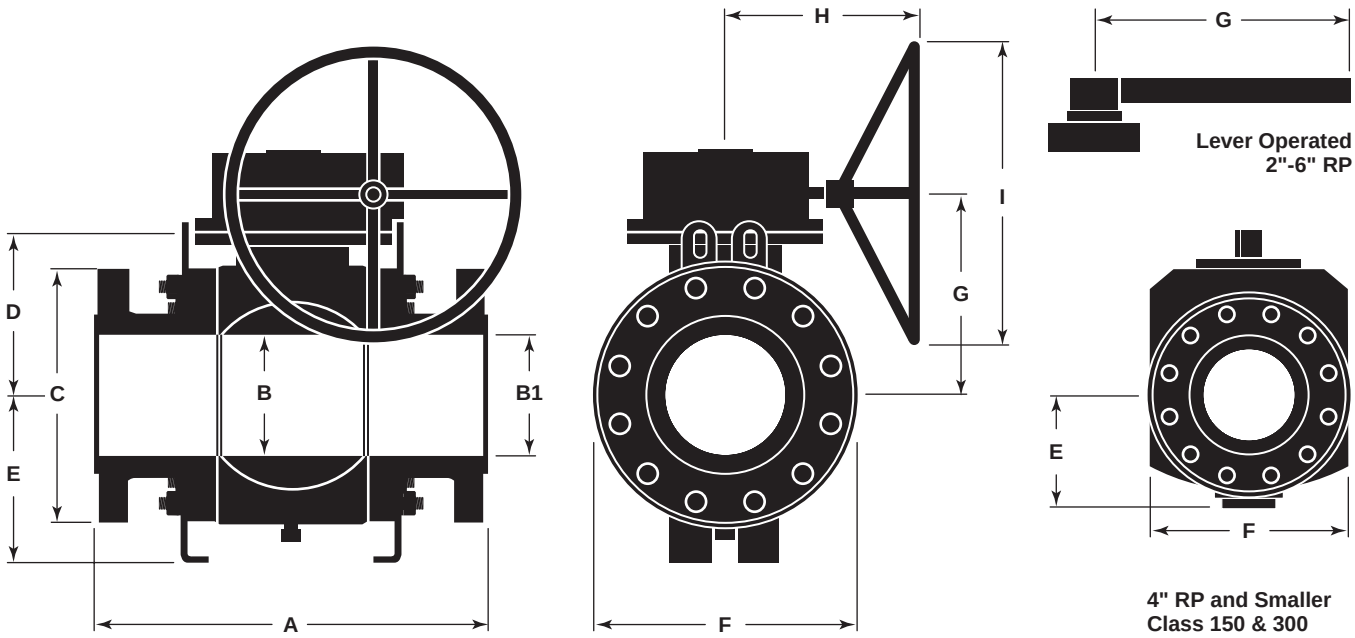
Series M3 Class 900 • Dimensional Data (in., mm)



Dimensional Data, 2"FP-16"FP, Class 900

Size (in.)	Dimension (in./mm)																							
	A						B		B1		C		D		E		F		G		H		I	
	RF		RTJ		WE																			
	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm
2	14.488	368	14.606	371	14.488	368	2	50.8	2	50.8	8.5	215.9	5.846	148.5	4.528	115	7.283	185	23.622	600	—	—	—	—
3x2	15	381	15.118	384	15	381	2	50.8	3	76.2	9.5	241.3	5.846	148.5	4.528	115	7.283	185	23.622	600	—	—	—	—
3	15	381	15.118	384	15	381	3	76.2	3	76.2	9.5	241.3	7.047	179	5.63	143	9.331	237	27.559	700	—	—	—	—
4x3	17.992	457	18.11	460	17.992	457	3	76.2	4.067	101.6	11.5	292.1	7.047	179	5.63	143	9.331	237	27.559	700	—	—	—	—
4	17.992	457	18.11	460	17.992	457	4.067	103.3	4.067	103.3	11.5	292.1	8.504	216	6.693	170	11.339	288	39.37	1000	—	—	—	—
6x4	24.016	610	24.134	613	24.016	610	4.067	103.3	6	152.4	15	381	8.504	216	6.693	170	11.339	288	39.37	1000	—	—	—	—
6	24.016	610	24.134	613	24.016	610	6	152.4	8	152.4	15	381	10.039	255	10.236	260	14.173	360	12.087	307	14.646	372	27.559	700
8x6	29.016	737	29.134	740	29.016	737	6	152.4	8	203.2	18.504	470	10.039	255	10.236	260	14.173	360	12.087	307	14.646	372	27.559	700
8	29.016	737	29.134	740	29.016	737	8	203.2	8	203.2	18.504	470	11.654	296	11.811	300	17.323	440	13.701	348	21.457	545	27.559	700
10x8	32.992	838	33.11	841	32.992	838	8	203.2	10	254	21.496	546	11.654	296	11.811	300	17.323	440	13.701	348	21.457	545	27.559	700
10	32.992	838	33.11	841	32.992	838	10	254	10	254	21.496	546	13.465	342	13.622	346	20.945	532	16.417	417	17.323	440	27.559	700
12x10	37.992	965	38.11	968	37.992	965	10	254	12	304.8	24.016	610	13.465	342	13.622	346	20.945	532	16.417	417	17.323	440	27.559	700
12	37.992	965	38.11	968	37.992	965	12	304.8	12	304.8	24.016	610	16.378	416	15.748	400	25.394	645	19.567	497	22.638	575	27.559	700
14 x12	40.512	1029	40.866	1038	40.512	1029	12	304.8	12.756	324	25.276	642	16.378	416	15.748	400	25.394	645	19.567	497	22.638	575	27.559	700
16x12	44.488	1130	44.882	1140	44.488	1130	12	304.8	14.752	374.7	27.756	705	16.378	416	15.748	400	25.394	645	19.567	497	22.638	575	27.559	700
14	40.512	1029	40.866	1038	40.512	1029	12.756	324	12.756	324	25.276	642	16.89	429	16.535	420	26.85	682	20.394	518	22.638	575	27.559	700
16	44.488	1130	44.882	1140	44.488	1130	14.752	374.7	14.752	374.7	27.756	705	19.488	495	18.898	480	31.496	800	23.031	585	22.795	579	27.559	700

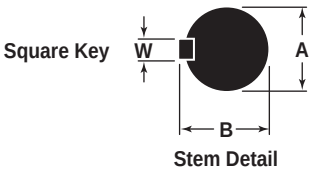
Series M3 Class 1500 • Dimensional Data (in., mm)

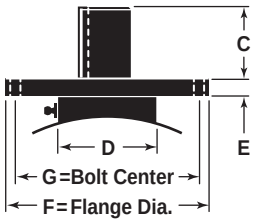


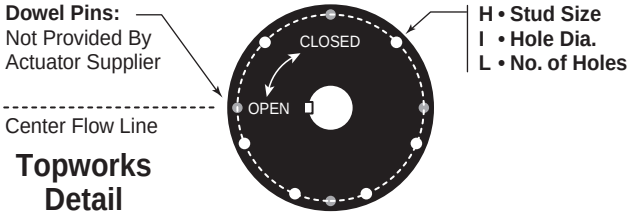
Dimensional Data, 2"FP–12"FP, Class 1500

Size (in.)	Dimension (in./mm)																							
	A						B		B1		C		D		E		F		G		H		I	
	RF		RTJ		WE																			
	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm
2	14 1/4	368	14 5/8	371	14 1/4	368	2	50.8	2	50.8	8.5	215.9	6.811	173	5.236	133	8.425	214	21.969	558	—	—	—	—
3x2	18 1/2	470	18 5/8	473	18 1/2	470	2	50.8	3	76.2	10.5	266.7	6.811	173	5.236	133	8.425	214	21.969	558	—	—	—	—
3	18 1/2	470	18 5/8	473	18 1/2	470	3	76.2	3	76.2	10.5	266.7	8.622	219	7.047	179	11.811	300	11.811	300	14.173	360	19.685	500
4x3	21 1/2	546	21 5/8	549	21 1/2	546	3	76.2	4.067	103.3	12.244	311	8.622	219	7.047	179	11.811	300	11.811	300	14.173	360	19.685	500
4	21 1/2	546	21 5/8	549	21 1/2	546	4.067	103.3	4.067	103.3	12.244	311	9.232	234.5	7.52	191	12.992	330	10.748	273	13.386	340	27.559	700
6x4	27 3/4	705	28	711	27 3/4	705	4.067	103.3	5.748	146	15.512	394	9.232	234.5	7.52	191	12.992	330	10.748	273	13.386	340	27.559	700
6	27 3/4	705	28	711	27 3/4	705	5.748	146	5.748	146	15.512	394	11.339	288	11.417	290	16.535	420	13.386	340	21.457	545	27.559	700
8x6	32 3/4	832	33 1/8	841	32 3/4	832	5.748	146	7.638	194	19.016	483	11.339	288	11.417	290	16.535	420	13.386	340	21.457	545	27.559	700
8	32 3/4	832	33 1/8	841	32 3/4	832	7.638	194	7.638	194	19.016	483	13.661	347	14.528	369	21.181	538	16.417	417	22.638	575	27.559	700
10x8	39	991	39 3/8	1000	39	991	7.638	194	9.488	241	23.031	585	13.661	347	14.528	369	21.181	538	16.417	417	22.638	575	27.559	700
10	39	991	39 3/8	1000	39	991	9.488	241	9.488	241	23.031	585	16.181	411	16.811	427	25.709	653	19.37	492	22.638	575	27.559	700
12x10	44 1/2	1130	45 1/8	1146	44 1/2	1130	9.488	241	11.378	289	26.496	673	16.181	411	16.811	427	25.709	653	19.37	492	22.638	575	27.559	700
12	44 1/2	1130	45 1/8	1146	44 1/2	1130	11.378	289	11.378	289	26.496	673	19.134	486	19.291	490	30.709	780	22.638	575	22.795	579	27.559	700

Series M3 Topworks & Stem Torque Data (in.)







Topworks Detail

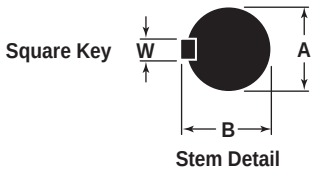
Valve Size (in.)	ANSI Class	A	B	C	D	E	F	G	H Stud Size	I Hole Dia.	L No. of Holes	W	Max. Stem Shear Torque ft.-lbs.	Break Torque in.-lbs.	Torque Expressions (1) for P<=2160 PSI in.-lbs. (2) (3)
2	150	0.87	0.556	1.142	—	0.394	4.126	—	—	—	—	—	134.6	820	0.409*P+708.20
2	300	0.87	0.556	1.142	—	0.394	4.126	—	—	—	—	—	134.6	1003	0.409*P+708.20
2	600	0.819	0.556	1.315	3.74	0.709	5.039	—	—	—	—	—	134.3	1297	0.409*P+708.20
2	900	0.819	0.556	1.346	3.858	0.709	5.039	—	—	—	—	—	134.8	1592	0.409*P+708.20
2	1500	1.102	0.744	2.13	8.071	0.394	5.197	—	—	—	—	—	305.8	2181	0.409*P+708.20
3	150	1.233	0.746	1.319	—	0.63	4.331	—	—	—	—	—	335.8	2032	1.758*P+1548.75
3	300	1.233	0.746	1.319	—	0.63	4.331	—	—	—	—	—	335.8	2815	1.758*P+1548.75
3	600	1.378	0.992	1.984	4.409	0.787	5.906	—	—	—	—	—	404.8	4080	1.758*P+1548.75
3	900	1.378	0.992	1.984	5.118	0.945	6.693	—	—	—	—	—	629.9	5346	1.758*P+1548.75
3	1500	1.491	0.991	1.957	4.921	0.394	6.693	—	—	—	—	—	725.8	7878	1.758*P+1548.75
4	150	1.233	0.746	2.008	4.134	0.787	5.709	—	—	—	—	—	347	3248	2.319*P+2610.75
4	300	1.233	0.746	1.811	4.134	0.984	5.906	4.921	1/2	0.551	4	—	347	4280	2.319*P+2610.75
4	600	1.495	0.994	1.878	5	1.024	6.614	—	—	—	—	—	724.8	5950	2.319*P+2610.75
4	900	1.495	0.994	1.681	5	1.22	6.89	5.512	5/8	0.65	4	—	728.2	7620	2.319*P+2610.75
4	1500	1.772	1.245	2.402	5.906	1.22	8.268	6.496	3/4	0.827	4	—	1337.1	10959	2.319*P+2610.75
6	150	1.99	1.245	2.079	4.921	1.299	6.89	5.512	5/8	0.689	4	—	1623.7	5607	7.446*P+3559.47
6	300	1.99	1.245	2.079	4.921	1.299	6.89	5.512	5/8	0.689	4	—	1623.7	8921	7.446*P+3559.47
6	600	1.99	1.245	2.354	4.921	1.299	6.89	5.512	5/8	0.689	4	—	1623.7	14282	7.446*P+3559.47
6	900	1.99	1.245	1.988	4.921	1.378	8.268	6.496	3/4	0.787	4	—	1695.3	19643	7.446*P+3559.47
6	1500	2.491	1.741	2.717	6.496	1.181	11.811	6.496	3/4	0.827	4	—	3722	30365	7.446*P+3559.47
8	150	2.495	1.743	2.398	6.299	1.732	8.268	6.496	3/4	0.827	4	—	3713.2	8728	11.535*P+5556.03
8	300	2.495	1.743	2.398	6.299	1.732	8.268	6.496	3/4	0.827	4	—	3713.2	13861	11.535*P+5556.03
8	600	2.87	3.194	3.571	6.299	1.732	8.268	6.496	3/4	0.815	4	0.75	7455.9	22166	11.535*P+5556.03
8	900	2.87	3.194	3.78	6.496	1.575	11.811	10	5/8	0.669	8	0.75	7460.4	30472	11.535*P+5556.03
8	1500	2.87	3.194	3.299	6.496	1.575	11.811	10	5/8	0.669	8	0.75	7460.4	47082	11.535*P+5556.03
10	150	2.87	3.199	3.083	3.89	0.984	11.811	10	5/8	0.709	8	0.75	7450.4	11687	14.402*P+7726.94
10	300	2.87	3.199	3.083	6.89	0.984	11.811	10	5/8	0.709	8	0.75	7450.4	18098	14.402*P+7726.94
10	600	3.24	3.623	3.583	6.89	0.984	11.3	10	5/8	0.709	8	0.875	10631.1	28465	14.402*P+7726.94
10	900	3.24	3.623	3.976	7.087	1.26	11.811	10	5/8	0.669	8	0.875	10631.1	38852	14.402*P+7726.94
10	1500	3.24	3.623	3.78	7.087	1.457	11.811	10	5/8	0.669	8	0.875	10631.1	59560	14.402*P+7726.94
12	150	3.24	3.618	3.642	8.567	1.201	11.811	10	5/8	0.709	8	0.875	10631.1	14636	16.6*P+10071.30
12	300	3.24	3.618	3.642	8.567	1.201	11.811	10	5/8	0.709	8	0.875	10631.1	22023	16.6*P+10071.30
12	600	3.992	4.429	3.713	8.504	1.319	12	10	5/8	0.709	8	1	20314.5	33975	16.6*P+10071.30
12	900	3.992	4.429	4.213	9.055	1.732	13.78	11.732	3/4	0.787	8	1	20314.5	45927	16.6*P+10071.30
12	1500	3.992	4.429	4.213	9.449	1.811	13.78	11.732	3/4	0.787	8	1	20314.5	69831	16.6*P+10071.30
14	150	2.87	3.194	4.311	8.071	1.3	11.811	10	5/8	0.709	8	0.75	7443.7	24717	28.32*P+16929.17
14	300	2.87	3.194	4.311	8.071	1.3	11.811	10	5/8	0.709	8	0.75	7443.7	37320	28.32*P+16929.17
14	600	2.87	3.623	3.602	8.071	1.3	13.78	11.732	3/4	0.866	8	0.875	10631.1	57710	28.32*P+16929.17
16	150	3.24	3.623	3.859	8.228	1.299	11.811	10	5/8	0.709	8	0.875	10631.1	33226	37.48*P+22919.73
16	300	3.24	3.623	3.839	8.228	1.299	11.811	10	5/8	0.709	8	0.875	10631.1	49905	37.48*P+22919.73
16	600	4.33	4.752	4.114	9.055	1.299	13.228	10	3/4	0.866	8	1	26103	76891	37.48*P+22919.73
16	900	4.33	4.752	4.252	9.134	1	13.228	11.732	3/4	0.787	8	1	26103	103876	37.48*P+22919.73
18	150	4.33	4.752	3.996	9.055	1.299	11.811	11.732	3/4	0.866	8	1	26103	45035	62.74*P+27781.92
18	300	4.33	4.752	3.996	9.055	1.299	11.811	11.732	3/4	0.866	8	1	26103	72955	62.74*P+27781.92
18	600	4.33	4.752	3.996	9.055	1.299	13.78	11.732	3/4	0.866	8	1	26103	118127	62.74*P+27781.92
20	150	4.33	4.752	4.528	9.252	1.575	13.386	11.732	3/4	0.866	8	1	26103	56690	91.86*P+31428.12
20	300	4.33	4.752	4.449	9.252	1.575	13.386	11.732	3/4	0.866	8	1	26103	97567	91.86*P+31428.12
20	600	4.33	4.752	4.37	9.843	1	13.78	11.732	3/4	0.866	8	1	26103	163706	91.86*P+31428.12
24	150	4.33	4.752	4.429	9.252	1.339	13.78	11.732	3/4	0.866	8	1	26103	108815	141.23*P+69976.95
24	300	4.33	4.752	4.429	9.252	1.339	13.78	11.732	3/4	0.866	8	1	26103	171663	141.23*P+69976.95
24	600	4.724	5.217	4.331	11.024	2.362	18.7	15.984	1 1/8	1.22	8	1	35488.8	273348	141.23*P+69976.95

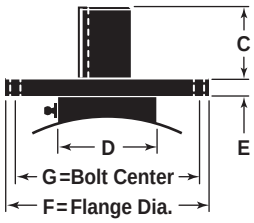
Note: (1) Torque at maximum differential pressure are tabulated
(2) Torques expressions are suggested for other differential pressure
(3) Differential pressure "P" in torque expressions is in PSI

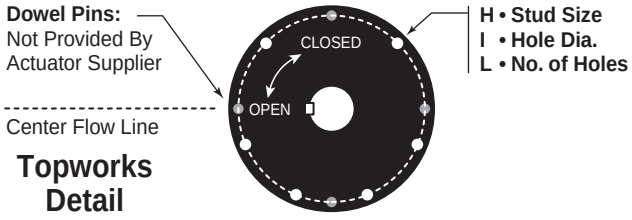
Pressure ratings are according to API 6D

Class 150	P = 275	Class 900	P = 2160
Class 300	P = 720	Class 1500	P = 3600
Class 600	P = 1440		

Series M3 Topworks (mm) & Stem Torque Data (Nm)







Topworks Detail

Valve Size (in.)	ANSI Class	A	B	C	D	E	F	G	H Stud Size	I Hole Dia.	L No. of Holes	W	Max. Stem Shear Torque Nm	Break Torque Nm	Torque Expressions (1) for P<=2160 PSI in.-lbs. (2) (3)
2	150	22.1	14.12	29	—	10	104.8	—	—	—	—	—	182.5	92.6	6.702*P+80.022
2	300	22.1	14.12	29	—	10	104.8	—	—	—	—	—	182.5	113.3	6.702*P+80.022
2	600	20.79	14.12	33.4	95	18	128	—	—	—	—	—	182.1	146.5	6.702*P+80.022
2	900	20.79	14.12	34.2	98	18	128	—	—	—	—	—	182.8	179.9	6.702*P+80.022
2	1500	28	18.91	54.1	107	10	132	—	—	—	—	—	414.6	246.4	6.702*P+80.022
3	150	31.32	18.95	33.5	—	16	110	—	—	—	—	—	455.3	229.6	28.808*P+175
3	300	31.32	18.95	33.5	—	16	110	—	—	—	—	—	455.3	318.1	28.808*P+175
3	600	35	25.2	50.4	112	20	150	—	—	—	—	—	548.8	460.9	28.808*P+175
3	900	35	25.2	50.4	130	24	170	—	—	—	—	—	854	604	28.808*P+175
3	1500	37.86	25.16	49.7	125	10	170	—	—	—	—	—	984	890	28.808*P+175
4	150	31.32	18.95	51	105	20	145	—	—	—	—	—	470.5	366.9	38.001*P+295
4	300	31.32	18.95	46	105	25	150	125	1/2	14	4	—	470.5	483.6	38.001*P+295
4	600	37.98	25.26	47.7	127	26	168	—	—	—	—	—	982.7	672.3	38.001*P+295
4	900	37.98	25.26	42.7	127	31	175	140	5/8	16.5	4	—	987.3	860.9	38.001*P+295
4	1500	45	31.63	61	150	31	210	165	3/4	21	4	—	1812.9	1238.2	38.001*P+295
6	150	50.55	31.63	52.8	125	33	175	140	5/8	17.5	4	—	2201.4	633.5	122.018*P+402.2
6	300	50.55	31.63	52.8	125	33	175	140	5/8	17.5	4	—	2201.4	1007.9	122.018*P+402.2
6	600	50.55	31.63	59.8	125	33	175	140	5/8	17.5	4	—	2201.4	1613.6	122.018*P+402.2
6	900	50.55	31.63	50.5	125	35	210	165	3/4	20	4	—	2298.5	2219.4	122.018*P+402.2
6	1500	63.28	44.22	69	160	30	300	165	3/4	21	4	—	5046.4	3430.8	122.018*P+402.2
8	150	63.37	44.28	60.9	160	44	210	165	3/4	21	4	—	5034.4	986.1	189.024*P+627.8
8	300	63.37	44.28	60.9	160	44	210	165	3/4	21	4	—	5034.4	1566.1	189.024*P+627.8
8	600	72.9	81.13	90.7	160	44	210	165	3/4	20.7	4	19.05	10108.8	2504.4	189.024*P+627.8
8	900	72.9	81.13	96	165	40	300	254	5/8	17	8	19.05	10114.9	3442.9	189.024*P+627.8
8	1500	72.9	81.13	83.8	165	40	300	254	5/8	17	8	19.05	10114.9	5319.6	189.024*P+627.8
10	150	72.9	81.25	78.3	175	25	300	254	5/8	18	8	19.05	10101.4	1320.5	236.006*P+873.101
10	300	72.9	81.25	78.3	175	25	300	254	5/8	18	8	19.05	10101.4	1566.1	236.006*P+873.101
10	600	82.3	92.03	91	175	25	287	254	5/8	18	8	22.23	14413.8	2504.4	236.006*P+873.101
10	900	82.3	92.03	101	180	32	300	254	5/8	17	8	22.23	14413.8	3442.9	236.006*P+873.101
10	1500	82.3	92.03	96	190	37	300	254	5/8	17	8	22.23	14413.8	5319.6	236.006*P+873.101
12	150	82.3	91.9	92.5	217.6	30.5	300	254	5/8	18	8	22.23	14413.8	1653.6	272.024*P+1138
12	300	82.3	91.9	92.5	217.6	30.5	300	254	5/8	18	8	22.23	14413.8	2488.3	272.024*P+1138
12	600	101.4	112.5	94.3	216	33.5	304.8	254	5/8	18	8	25.4	27542.8	3838.7	272.024*P+1138
12	900	101.4	112.5	107	230	44	350	298	3/4	20	8	25.4	27542.8	5189.1	272.024*P+1138
12	1500	101.4	112.5	107	240	46	350	298	3/4	20	8	25.4	27542.8	7889.8	272.024*P+1138
14	150	72.91	81.13	109.5	205	33	300	254	5/8	18	8	19.05	10092.3	2792.6	464.080*P+1912.901
14	300	72.91	81.13	109.5	205	33	300	254	5/8	18	8	19.05	10092.3	4216.6	464.080*P+1912.901
14	600	72.91	92.03	91.5	205	33	350	298	3/4	22	8	22.23	14413.8	6520.4	464.080*P+1912.901
16	150	82.3	92.03	97.5	209	33	300	254	5/8	18	8	22.23	14413.8	3754	614.185*P+2589.8
16	300	82.3	92.03	97.5	209	33	300	254	5/8	18	8	22.23	14413.8	5638.5	614.185*P+2589.8
16	600	110	120.7	104.5	230	33	336	298	3/4	22	8	25.4	35390.9	8687.5	614.185*P+2589.8
16	900	110	120.7	108	232	25.4	336	298	3/4	20	8	25.4	35390.9	11736.4	614.185*P+2589.8
18	150	110	120.7	101.5	230	33	300	298	3/4	22	8	25.4	35390.9	5088.3	1028.12*P+3139.2
18	300	110	120.7	101.5	230	33	300	298	3/4	22	8	25.4	35390.9	8242.8	1028.12*P+3139.2
18	600	110	120.7	101.5	230	33	350	298	3/4	22	8	25.4	35390.9	13346.6	1028.12*P+3139.2
20	150	110	120.7	115	235	40	340	298	3/4	22	8	25.4	35390.9	6405.1	1505.31*P+3551.2
20	300	110	120.7	113	235	40	340	298	3/4	22	8	25.4	35390.9	11023.6	1505.31*P+3551.2
20	600	110	120.7	111	250	25.4	350	298	3/4	22	8	25.4	35390.9	18490	1505.31*P+3551.2
24	150	110	120.7	112.5	235	34	350	298	3/4	22	8	25.4	35390.9	12294.4	2314.336*P+7907
24	300	110	120.7	112.5	235	34	350	298	3/4	22	8	25.4	35390.9	19395.3	2314.336*P+7907
24	600	120	132.5	110	280	60	475	406	1 1/8	31	8	25.4	48116.4	30880	2314.336*P+7907

Note: (1) Torque at maximum differential pressure are tabulated
(2) Torques expressions are suggested for other differential pressure
(3) Differential pressure "P" in torque expressions is in PSI

Pressure ratings are according to API 6D

Class 150	P = 275	Class 900	P = 2160
Class 300	P = 720	Class 1500	P = 3600
Class 600	P = 1440		

Flow Coefficient (C_v) and Operating Torque

Series FE Ball Valve

Size (In.)	Cv Value			Operating Torque (In.-Lbs.)		
	285 psi	740 psi	1480 psi	285 psi	740 psi	1480 psi
1FP	95	95	93	300	360	600
1 1/2FP	308	308	308	540	720	900
2RP	140	140	140	540	720	900
2FP	500	420	365	600	960	1200
3RP	220	210	185	600	960	1200
3FP	1390	1050	1000	1320	2160	2700
4RP	630	600	570	1320	2160	2700
4FP	2550	2000	1800	2160	3600	5280
6RP	925	910	900	2160	3600	5280
6FP	5249	5186	4600	5500	12,000	27,000
8RP	2500	2498	2235	5500	12,000	27,000
8FP	10,750	10,262	—	12,000	27,000	—
10RP	5000	4990	—	12,000	27,000	—
10FP	17,775	17,220	—	23,000	55,000	—
12RP	8400	8390	—	23,000	—	—

Series FAE Ball Valve

Size (In.)	Cv Value		Operating Torque (In.-Lbs.)	
	285 psi	740 psi	285 psi	740 psi
2FP	500	420	360	600
3RP	220	210	360	600
3FP	1390	1050	750	1356
4RP	630	600	750	1356
4FP	2550	2000	1360	1650
6RP	925	910	1360	1650
6FP	5249	5186	3175	5712
8RP	2500	2498	3175	5712
8FP	10,750	10,262	6445	10,900
10RP	5000	4990	6445	10,900
10FP	17,775	17,220	10,130	17,875
12RP	8400	8390	10,130	17,875
12FP	26,750	25,952	17,625	27,473

Series M3 Ball Valve

Size (In.)	Cv Value				
	285 psi	740 psi	1480 psi	2220 psi	3705 psi
2	500	420	350	320	330
3 x 2	220	210	190	185	187
3	1390	1050	1000	910	830
4 x 3	630	600	560	505	510
4	2550	2000	1850	1760	1660
6 x 4	925	910	800	730	742
6	5249	5186	4400	4300	4167
8 x 6	2500	2498	2150	2010	2033
8	10,750	10,262	8450	8400	8013
10 x 8	5000	4990	4500	4160	4051
10	17,775	17,220	14,250	14,160	13,309
12 x 10	8400	8390	8000	7300	7117
12	26,750	25,950	22,790	21,230	17,073
14 x 12	14,080	14,040	13,990	13,920	14,180
16 x 12	9030	9020	9010	9000	
14	32,600	30,900	28,600	26,600	24,276
16 x 14	14,780	14,750	14,720	14,690	14,247
16	44,700	42,600	39,250	36,600	33,215
20 x 16	14,870	14,860	14,850	14,830	14,795
18	57,825	56,225	57,410	48,665	43,402
20	74,775	71,800	65,463	62,239	55,931
24 x 20	26,768	26,755	25,698	26,659	—
22	91,789	88,537	81,305	—	—
24	113,284	109,414	98,963	93,993	83,926

Flow Coefficient (C_v) and Operating Torque

Series TE Ball Valve

Size (In.)	Cv Value		Operating Torque (In.-Lbs.)	
	1480 psi	2220 psi	1480 psi	2220 psi
2RP	135	125	690	1025
2FP	350	320	840	1200
3RP	190	185	840	1200
3FP	1000	910	1800	2250
4RP	560	505	1800	2250
4FP	1850	1760	4000	5150
6RP	800	730	4000	5150
6FP	4400	4300	8900	11,500
8RP	2150	2010	8900	11,500
8FP	8450	8400	14,500	24,000
10RP	4500	4160	14,500	24,000
10FP	17,250	14,160	29,000	48,200
12RP	80,000	7300	29,000	48,200
12FP	21,250	21,230	451,000	70,000

Series 1500/2500 Ball Valve

Size (In.)	Cv Value	Operating Torque (In.-Lbs.)
1 1/2 RP	90	180
2 RP	125	240
3 RP	430	520
4 RP	600	600
6 RP	1010	1440

Series 1800/2800 Ball Valve

Size (In.)	C_v Value	Operating Torque (In.-Lbs.)	
		285 psi	740 psi
1 FP	95	180	180
1 1/2 FP	265	280	280
2 FP	470	440	500
3 FP	1240	600	1000
4 FP	2470	1440	2500
6 FP	5249	5000	7000
8 RP	2500	5000	7000
8 FP	10,750	12,000	27,000
10 RP	5000	12,000	—
10 FP	17,775	30,000	—
12 RP	8400	30,000	—

Method of Calculating Flow

The Flow Coefficient "C_v" of a valve is the flow rate of water (gallons/minute) through a fully opened valve, with a pressure drop of 1 psi across the valve. To find the flow of liquid through valve from the C_v, use the following formulas:

Liquid Flow

QL = flow rate of liquid (gal./min.)
ΔP = differential pressure across the valve (psi)
G = specific gravity of liquid (for water, G=1)

$$QL = C_v \sqrt{\frac{\Delta P}{G}}$$

Gas Flow

Qg = flow rate of gas (CFH at STP)
P2 = outlet pressure (psia)
g = Specific gravity of gas (for air, g=1.000)

$$Qg = 61 C_v \sqrt{\frac{P_2 \Delta P}{g}}$$

For non-critical flow

$$\left\{\frac{\Delta P}{P_2} < 1.0\right\}$$

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