

Durco TX3

Triple Offset Butterfly Valve

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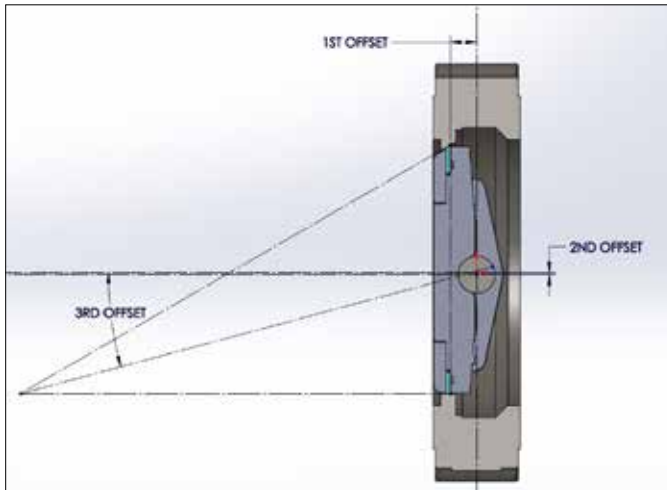
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Triple Offset Butterfly Valve

The Flowserve TX3 triple offset butterfly valve offers excellent shutoff capabilities, with the low torque and reduced wear benefits of a triple offset design. The laminated disc seal, in conjunction with the triple offset geometry, results in a design that can provide bidirectional, bubble-tight shutoff.



About Triple Offset Valve Technology

Flowserve triple offset metal seated valves feature a special sealing mechanism, comprised of contacts of an inclined and conical body seat with laminated seal ring. As a result, the friction and abrasion between the sealing elements (i.e., seal ring and body seat) are eliminated. The unique feature of this design is that it provides low torque, broad sealing and tight shutoff.

Single Offset

The rotation axis of the disc is moved back from the sealing surfaces of the body seat. The purpose of this offset is to have a continuous sealing surface on the seal ring and body seat.

Double Offset

The rotation axis of the disc is moved away from the center line of the valve body. The purpose of this offset is to lift the disc and seal ring quickly off and away from the body seat while decreasing the friction during operation.

Triple Offset

The virtual conic axis, extended from the sealing surfaces of the body seat, is inclined from the rotation axis of the disc. The purpose of this offset is to eliminate friction, galling and wear generated at the sealing surface during operation and provide bubble-tight shutoff on high pressure and temperature.

Product Specifications

The Flowserve TX3 triple offset butterfly valve meets a number of industry standards for performance:

Table 1 – Product Specifications

Design Standards	ASME B16.34, API 609 (Category B), PED
Sizes	3 to 24 NPS
Pressure Classes	ANSI Class 150, 300, 600, 900, 1500
End Connections	Lugged, Wafer, Double Flanged (long and short), Butt-weld (cryogenic)
Face-to-Face	API 609 (lug and wafer), API 609 and B16.10 (long pattern), API 609 and ISO 5752 (short pattern)
Operating Temperature	Standard -58°F (-50°C) to 800°F (427°C), High Temperature to 1500°F (820°C), Cryogenic to -320°F (-196°C)
Leakage Rates	API 598 and ISO 5208 Rate A (laminated seat); Rate CC (metal seat)
Fire Safety	API 607, ISO 10497
Fugitive Emissions	ISO 15848 Tightness Class BH, Endurance Class C01 (low emissions packing)
Country Approvals	PED (EU), TRCU (Russia), CRN (Canada)

Features and Benefits

- Triple offset design — eliminates wear associated with sealing surface contact and maintains sealing integrity during high cycle
- Laminated graphite or metal-to-metal sealing provides robust performance in a wide range of harsh and difficult services
- Robust, anti-blowout shaft meets requirements of API 609
- Bi-directional, tight shut-off
- Low-operating torque for compact, cost-effective actuation
- Meets industry standards for design, fire safety and fugitive emissions

Sealing System

Principle of Sealing System

TX3 triple offset valves operate using a camming action which reduces the possibility of galling or scratching on the sealing surfaces between the sealing elements (i.e., disc and seat). It also reduces the possibility of jamming between the sealing elements, which can happen with valves that rely on single-point sealing.

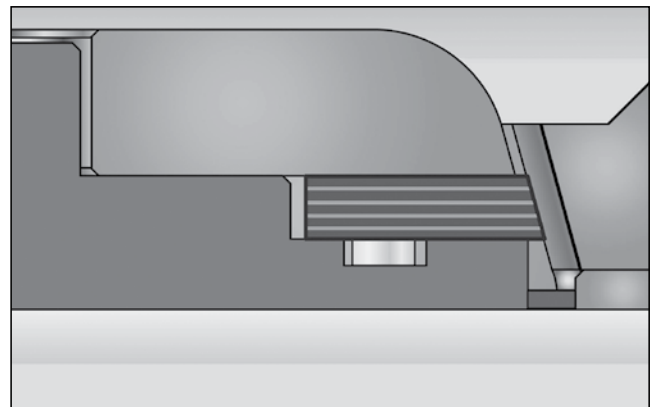
The sealing surfaces of the Flowserve valve disc have different angles in all points. The Flowserve TX3 valve has an elliptical sealing system. The sealing surfaces of an elliptical sealing system are completely in contact at the final position only, and upon opening, all contact points are released immediately from the seat ring. This mechanism provides flawless bubble-tight shutoff. Therefore, the seat ring is not directly influenced by fluid in open positions.

The TX3 triple offset butterfly valve is a torque-seated valve, utilizing the torque provided by the operator to create a seal, rather than by positioning of the disc. This provides a robust, positive means for shut-off, particularly for high-pressure and/or high-temperature applications.

Laminated Seal Ring

The laminated seal ring is composed of alternating layers of metal and graphite. The laminated seal ring of a TX3 valve provides bubble-tight shutoff, even in gas applications. Each individual layer performs an independent sealing and is unaffected by the damages to other layers. The elements of the laminated metal plate can be offered with various metals, including 316SS, Duplex, Inconel, Monel and Hastelloy®, depending on the application.

Additionally, for high-temperature and more severe applications, a solid metal seal ring is available. The solid metal seal ring is also used for cryogenic applications.



Packing and Bearings

The TX3 butterfly valve uses proven packing designs to provide trouble-free stem seal performance for a variety of applications. Material options include PTFE for optimum leakage control, while graphite provides fire-safe protection. Options include single and double packing sets, purge ports and spring loading for high-cycle or high-temperature swing services.

Robust bearing design provides solid shaft support to maximize service life and control valve performance. Materials are offered to provide corrosion resistance in a variety of harsh chemical services.

End Connections, Flanges and Bolting

The TX3 butterfly control valve is offered in several standard end connections to meet a variety of industry standards and customer applications. Lug, wafer and double-flanged styles are offered as standard. Face to face dimensions for all styles will meet the API 609 standard.

Table 2 – Bearings

Bearing Material	Recommended Shaft Materials
316 SS Nitrided	410SS, Nitronic 50, 17-4 PH, Monel, Inconel
Stellite, 316 Stellite	410SS, Nitronic 50, Inconel, Monel

The standard 316SS bearing with Nitride treatment is compatible with all shaft materials and will work acceptably in most applications. For special applications where a customer's application or specifications demand a more durable bearing, a solid stellite or stellite overlaid 316SS bearing is available.

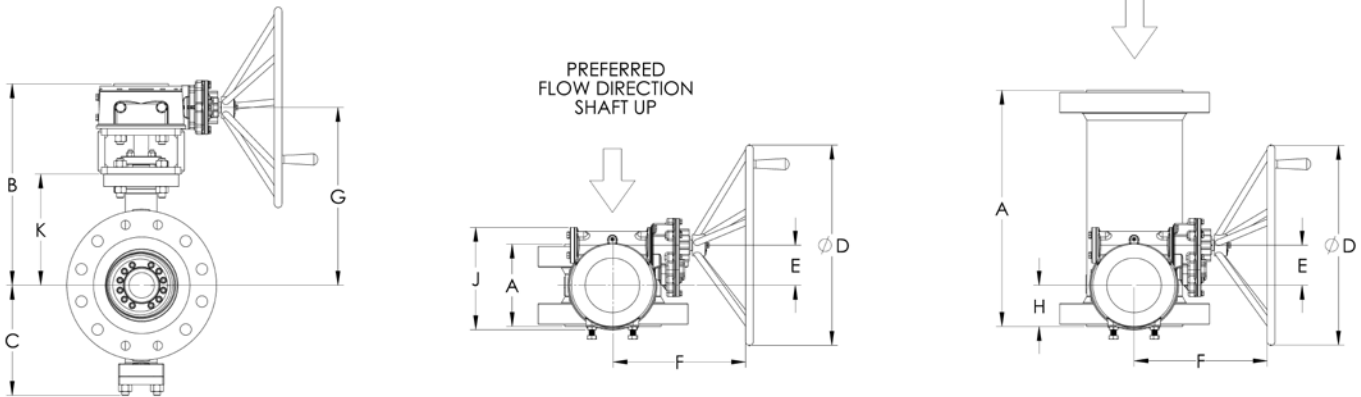
Note: Valves with shaft diameters 1.5" or smaller must use a solid stellite bearing; overlay is not possible on these sizes of bearings.

Table 3 – Packing Options

Packing System	Packing Description	Max. Pressure		Max. Temp		Options Availability	Certification Approvals
		psi	bar	F	C		
Standard PTFE V-Ring	Virgin PTFE V-rings	4000	276	-148 to 400	-100 to 204	Single/Twin/Live Loading	-
	Filled PTFE V-rings	4500	310	-148 to 500	-100 to 260	Single/Twin/Live Loading	-
Graphite Rib-Braided	Combination of braided carbon rings and die-formed graphite square rings	4400	300	-320 to 1200	-196 to 650	Single/Twin/Live Loading	API 607
Safeguard (Live Loaded)	Combination of virgin and carbon-filled PTFE V-rings	3000	207	-60 to 450	-51 to 230	Single/Twin	-
Sureguard	Combination of perfluoroelastomer and filled PTFE V-ring	2000	138	-20 to 450	-29 to 230	Single/Twin/Live Loading	-
Sureguard XT	Combination of perfluoroelastomer and Vespel® V-rings	4000	276	-20 to 450	-29 to 230	Single/Twin/Live Loading	-

Note: Cryogenic stem extension required for temperatures below -60°F / -51°C. Higher temperature limits can be achieved with stem extensions. Consult factory for details. Graphite Rib packing is limited to 842°F (450°C) in oxidizing service.

Flanged and Double Flanged Dimensions — U.S.



Notes: Flange dimensions per B16.5. Some sizes have tapped holes around the shaft area (top and bottom); consult factory for actual dimensions. Consult factory for Class 900 and Class 1500 dimensions.

ASME CLASS 150 (inch dimensions)

SIZE	A (Face to Face)		B	C	Ø D	E	F	G	H	J	K	Weight, lbs	
	Short	Long										Short	Long
3	4.50	8.00	11.51	6.02	7.87	1.65	5.91	9.94	2.25	5.20	5.43	49	53
4	5.00	9.00	12.87	6.18	7.87	1.65	5.91	11.30	2.50	5.20	6.31	66	75
6	5.50	10.50	14.50	7.37	7.87	1.65	5.91	12.93	2.75	5.20	7.30	86	99
8	6.00	11.50	18.48	8.75	11.81	2.76	10.20	16.69	3.00	8.27	10.75	148	170
10	6.50	13.00	20.86	10.13	11.81	2.76	10.20	19.07	3.25	8.27	12.00	214	247
12	7.00	14.00	22.49	12.37	11.81	3.27	11.34	20.72	3.50	9.27	13.50	309	353
14	7.50	15.00	24.35	13.50	11.81	3.27	11.34	22.58	3.75	9.27	14.90	388	441
16	8.50	16.00	26.77	15.00	22.05	4.41	14.69	24.40	4.25	12.28	16.15	551	617
18	8.75	17.00	28.06	15.64	22.05	4.41	14.69	25.69	4.38	12.28	16.90	666	758
20	9.00	18.00	29.49	17.80	22.05	5.00	15.39	26.89	4.50	13.37	18.66	908	1032
24	10.50	20.00	34.80	20.97	24.80	6.02	17.68	31.76	5.25	16.46	22.39	1367	1530

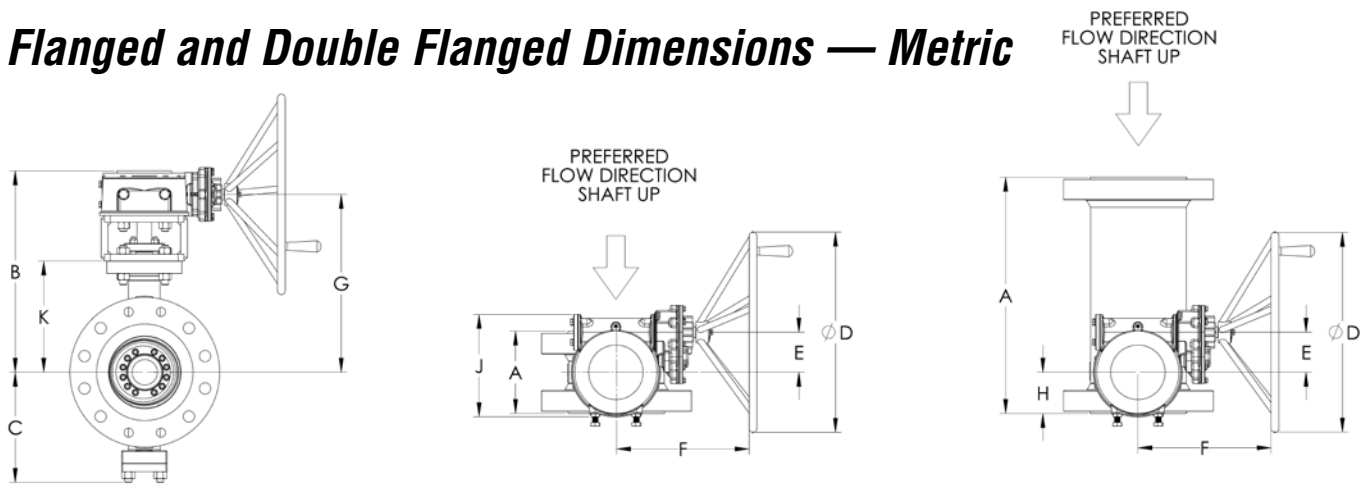
ASME CLASS 300 (inch dimensions)

SIZE	A (Face to Face)		B	C	Ø D	E	F	G	H	J	K	Weight, lbs	
	Short	Long										Short	Long
3	4.50	11.12	12.98	6.02	7.87	1.65	5.91	11.41	2.25	5.20	5.93	57	68
4	5.00	12.00	13.54	6.68	7.87	1.65	5.91	11.97	2.50	5.20	6.81	82	99
6	5.50	15.88	16.53	8.38	11.81	2.76	10.20	14.74	2.75	8.27	9.14	154	192
8	6.00	16.50	20.67	10.37	11.81	3.27	11.34	18.90	3.00	9.27	11.51	238	289
10	6.50	18.00	22.64	11.69	19.69	3.82	12.56	20.45	3.25	11.10	12.75	348	425
12	7.00	19.75	24.07	14.49	22.05	4.41	14.69	21.70	3.50	12.28	14.25	503	626
14	7.50	30.00	26.54	15.66	22.05	5.00	15.39	23.94	3.75	13.37	15.90	699	979
16	8.50	33.00	29.05	17.50	24.80	6.02	17.68	26.01	4.25	16.46	17.39	972	1329
18	8.75	36.00	31.24	18.37	24.80	6.02	17.68	28.20	4.38	16.46	19.20	1190	1669
20	9.00	39.00	35.14	19.56	27.95	7.09	18.86	32.03	4.50	18.48	21.16	1523	2183
24	10.50	45.00	38.67	23.12	22.05	7.95	21.65	35.40	5.25	20.33	25.00	2306	3250

ASME CLASS 600 (inch dimensions)

SIZE	A (Face to Face)		B	C	Ø D	E	F	G	H	J	K	Weight, lbs	
	Short	Long										Short	Long
3	7.09	14.00	11.16	6.52	7.87	1.65	5.91	9.59	3.55	5.20	5.93	73	82
4	7.48	17.00	16.75	7.69	11.81	2.76	10.20	14.96	3.74	8.27	8.27	146	174
6	8.27	22.00	19.10	9.25	11.81	3.27	11.34	17.33	4.14	9.27	10.61	245	311
8	9.06	26.00	22.06	12.12	22.05	4.41	14.69	19.69	4.53	12.28	12.25	432	556
10	9.84	31.00	24.58	14.32	22.05	5.00	15.39	21.98	4.92	13.37	14.00	686	917
12	10.63	33.00	27.77	15.75	24.80	6.02	17.68	24.73	5.32	16.46	15.11	908	1259
14	11.42	35.00	29.10	17.60	27.95	7.09	18.86	25.99	5.71	18.48	16.28	1164	1567
16	12.20	39.00	32.96	18.12	22.05	7.95	21.65	29.69	6.10	20.33	19.67	1565	2125
18	12.99	43.00	37.41	20.12	31.50	9.06	22.80	33.71	6.50	24.45	21.79	2167	2961
20	13.78	47.00	41.49	22.25	31.50	9.06	22.80	37.79	6.89	24.45	24.63	2718	3776
24	15.35	55.00	47.59	26.15	27.95	11.06	29.53	43.06	7.68	28.46	27.25	4039	5849

Flanged and Double Flanged Dimensions — Metric



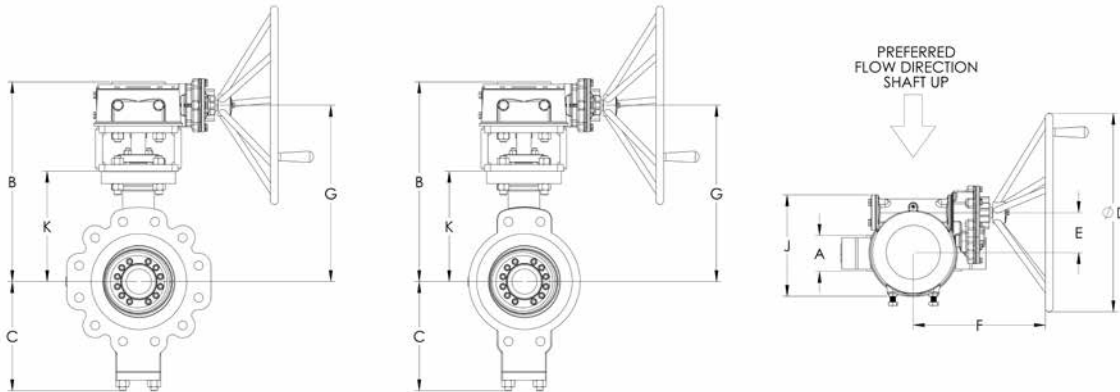
Notes: Flange dimensions per B16.5. Some sizes have tapped holes around the shaft area (top and bottom); consult factory for actual dimensions. Consult factory for Class 900 and Class 1500 dimensions.

ASME CLASS 150 (metric dimensions)													
SIZE	A (Face to Face)		B	C	Ø D	E	F	G	H	J	K	Weight, kg	
	Short	Long										Short	Long
3	114	203	292	153	200	42	150	252	57	132	138	22	24
4	127	229	327	157	200	42	150	287	64	132	160	30	34
6	140	267	368	187	200	42	150	328	70	132	185	39	45
8	152	292	469	222	300	70	259	424	76	210	273	67	77
10	165	330	530	257	300	70	259	484	83	210	305	97	112
12	178	356	571	314	300	83	288	526	89	235	343	140	160
14	191	381	618	343	300	83	288	574	95	235	378	176	200
16	216	406	680	381	560	112	373	620	108	312	410	250	280
18	222	432	713	397	560	112	373	653	111	312	429	302	344
20	229	457	749	452	560	127	391	683	114	340	474	412	468
24	267	508	884	533	630	153	449	807	133	418	569	620	694

ASME CLASS 300 (metric dimensions)													
SIZE	A (Face to Face)		B	C	Ø D	E	F	G	H	J	K	Weight, kg	
	Short	Long										Short	Long
3	114	282	330	153	200	42	150	290	57	132	151	26	31
4	127	305	344	170	200	42	150	304	64	132	173	37	45
6	140	403	420	213	300	70	259	374	70	210	232	70	87
8	152	419	525	263	300	83	288	480	76	235	292	108	131
10	165	457	575	297	500	97	319	519	83	282	324	158	193
12	178	502	611	368	560	112	373	551	89	312	362	228	284
14	191	762	674	398	560	127	391	608	95	340	404	317	444
16	216	838	738	444	630	153	449	661	108	418	442	441	603
18	222	914	793	467	630	153	449	716	111	418	488	540	757
20	229	991	893	497	710	180	479	814	114	469	537	691	990
24	267	1143	982	587	560	202	550	899	133	516	635	1046	1474

ASME CLASS 600 (metric dimensions)													
SIZE	A (Face to Face)		B	C	Ø D	E	F	G	H	J	K	Weight, kg	
	Short	Long										Short	Long
3	180	356	283	166	200	42	150	244	90	132	151	33	37
4	190	432	425	195	300	70	259	380	95	210	210	66	79
6	210	559	485	235	300	83	288	440	105	235	269	111	141
8	230	660	560	308	560	112	373	500	115	312	311	196	252
10	250	787	624	364	560	127	391	558	125	340	356	311	416
12	270	838	705	400	630	153	449	628	135	418	384	412	571
14	290	889	739	447	710	180	479	660	145	469	414	528	711
16	310	991	837	460	560	202	550	754	155	516	500	710	964
18	330	1092	950	511	800	230	579	856	165	621	553	983	1343
20	350	1194	1054	565	800	230	579	960	175	621	626	1233	1712
24	390	1397	1209	664	710	281	750	1094	195	723	692	1832	2653

Lug and Wafer Dimensions — U.S.



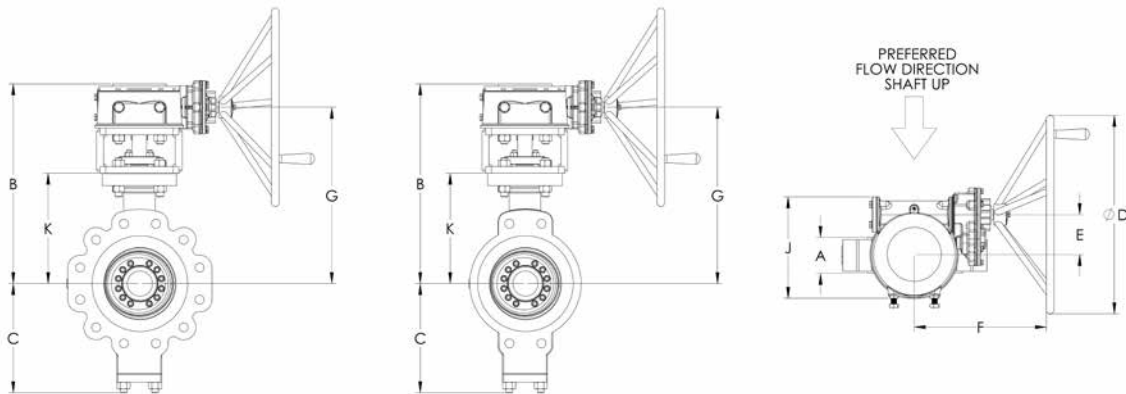
Notes: Flange dimensions per B16.5. Some sizes have tapped holes around the shaft area (top and bottom); consult factory for actual dimensions. Consult factory for Class 900 and Class 1500 dimensions.

ASME CLASS 150 (inch dimensions)												
SIZE	A		B	C	Ø D	E	F	G	J	K	Weight, lbs	
	Lug	Wafer									Lug	Wafer
3	1.88	1.88	11.51	6.02	7.87	1.65	5.91	9.94	5.20	5.43	33	29
4	2.12	2.12	12.87	6.18	7.87	1.65	5.91	11.30	5.20	6.31	51	42
6	2.25	2.25	14.50	7.37	7.87	1.65	5.91	12.93	5.20	7.30	64	53
8	2.50	2.50	18.48	8.75	11.81	2.76	10.20	16.69	8.27	10.75	119	108
10	2.81	2.81	20.86	10.13	11.81	2.76	10.20	19.07	8.27	12.00	176	157
12	3.19	3.19	22.49	12.37	11.81	3.27	11.34	20.72	9.27	13.50	267	234
14	3.62	3.62	24.35	13.50	11.81	3.27	11.34	22.58	9.27	14.90	344	300
16	4.00	4.00	26.77	15.00	22.05	4.41	14.69	24.40	12.28	16.15	489	432
18	4.50	4.50	28.06	15.64	22.05	4.41	14.69	25.69	12.28	16.90	602	525
20	5.00	5.00	29.49	17.80	22.05	5.00	15.39	26.89	13.37	18.66	840	730
24	6.06	6.06	34.80	20.97	24.80	6.02	17.68	31.76	16.46	22.39	1283	1155

ASME CLASS 300 (inch dimensions)												
SIZE	A		B	C	Ø D	E	F	G	J	K	Weight, lbs	
	Lug	Wafer									Lug	Wafer
3	1.88	1.88	12.98	6.02	7.87	1.65	5.91	11.41	5.20	5.93	42	37
4	2.12	2.12	13.54	6.68	7.87	1.65	5.91	11.97	5.20	6.81	57	44
6	2.31	2.31	16.53	8.38	11.81	2.76	10.20	14.74	8.27	9.14	115	101
8	2.88	2.88	20.67	10.37	11.81	3.27	11.34	18.90	9.27	11.51	183	163
10	3.25	3.25	22.64	11.69	19.69	3.82	12.56	20.45	11.10	12.75	282	243
12	3.62	3.62	24.07	14.49	22.05	4.41	14.69	21.70	12.28	14.25	403	344
14	4.62	4.62	26.54	15.66	22.05	5.00	15.39	23.94	13.37	15.90	642	540
16	5.25	5.25	29.05	17.50	24.80	6.02	17.68	26.01	16.46	17.39	895	756
18	5.88	5.88	31.24	18.37	24.80	6.02	17.68	28.20	16.46	19.20	1133	944
20	6.25	6.25	35.14	19.56	27.95	7.09	18.86	32.03	18.48	21.16	1442	1208
24	7.12	7.12	38.67	23.12	22.05	7.95	21.65	35.40	20.33	25.00	2213	1854

ASME CLASS 600 (inch dimensions)												
SIZE	A		B	C	Ø D	E	F	G	J	K	Weight, lbs	
	Lug	Wafer									Lug	Wafer
3	2.12	2.12	11.16	6.52	7.87	1.65	5.91	9.59	5.20	5.93	46	42
4	2.50	2.50	16.75	7.69	11.81	2.76	10.20	14.96	8.27	8.27	97	82
6	3.06	3.06	19.10	9.25	11.81	3.27	11.34	17.33	9.27	10.61	161	137
8	4.00	4.00	22.06	12.12	22.05	4.41	14.69	19.69	12.28	12.25	322	280
10	4.62	4.62	24.58	14.32	22.05	5.00	15.39	21.98	13.37	14.00	529	450
12	5.50	5.50	27.77	15.75	24.80	6.02	17.68	24.73	16.46	15.11	743	646
14	6.12	6.12	29.10	17.60	27.95	7.09	18.86	25.99	18.48	16.28	1005	869
16	7.00	7.00	32.96	18.12	22.05	7.95	21.65	29.69	20.33	19.67	1369	1177
18	7.88	7.88	37.41	20.12	31.50	9.06	22.80	33.71	24.45	21.79	1953	1700
20	8.50	8.50	41.49	22.25	31.50	9.06	22.80	37.79	24.45	24.63	2471	2149
24	9.13	9.13	47.59	26.15	27.95	11.06	29.53	43.06	28.46	27.25	3558	3150

Lug and Wafer Dimensions — Metric



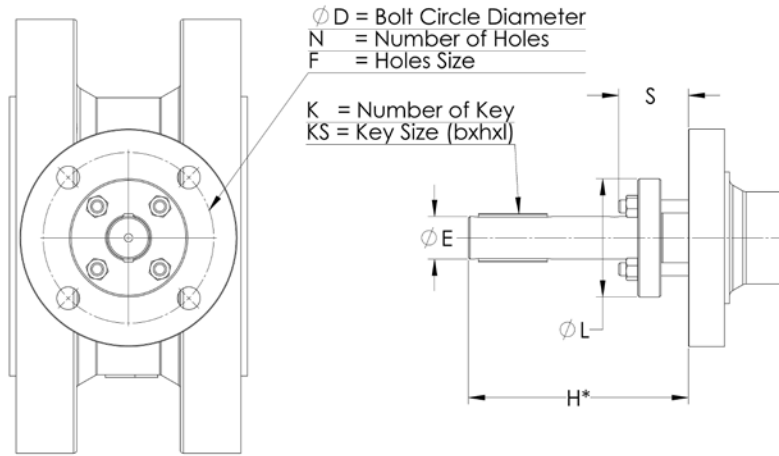
Notes: Flange dimensions per B16.5. Some sizes have tapped holes around the shaft area (top and bottom); consult factory for actual dimensions. Consult factory for Class 900 and Class 1500 dimensions.

ASME CLASS 150 (metric dimensions)												
SIZE	A		B	C	Ø D	E	F	G	J	K	Weight, kg	
	Lug	Wafer									Lug	Wafer
3	48	48	292	153	200	42	150	252	132	138	15	13
4	54	54	327	157	200	42	150	287	132	160	23	19
6	57	57	368	187	200	42	150	328	132	185	29	24
8	64	64	469	222	300	70	259	424	210	273	54	49
10	71	71	530	257	300	70	259	484	210	305	80	71
12	81	81	571	314	300	83	288	526	235	343	121	106
14	92	92	618	343	300	83	288	574	235	378	156	136
16	102	102	680	381	560	112	373	620	312	410	222	196
18	114	114	713	397	560	112	373	653	312	429	273	238
20	127	127	749	452	560	127	391	683	340	474	381	331
24	154	154	884	533	630	153	449	807	418	569	582	524

ASME CLASS 300 (metric dimensions)												
SIZE	A		B	C	Ø D	E	F	G	J	K	Weight, kg	
	Lug	Wafer									Lug	Wafer
3	48	48	330	153	200	42	150	290	132	151	19	17
4	54	54	344	170	200	42	150	304	132	173	26	20
6	59	59	420	213	300	70	259	374	210	232	52	46
8	73	73	525	263	300	83	288	480	235	292	83	74
10	83	83	575	297	500	97	319	519	282	324	128	110
12	92	92	611	368	560	112	373	551	312	362	183	156
14	117	117	674	398	560	127	391	608	340	404	291	245
16	133	133	738	444	630	153	449	661	418	442	406	343
18	149	149	793	467	630	153	449	716	418	488	514	428
20	159	159	893	497	710	180	479	814	469	537	654	548
24	181	181	982	587	560	202	550	899	516	635	1004	841

ASME CLASS 600 (metric dimensions)												
SIZE	A		B	C	Ø D	E	F	G	J	K	Weight, kg	
	Lug	Wafer									Lug	Wafer
3	54	54	283	166	200	42	150	244	132	151	21	19
4	64	64	425	195	300	70	259	380	210	210	44	37
6	78	78	485	235	300	83	288	440	235	269	73	62
8	102	102	560	308	560	112	373	500	312	311	146	127
10	117	117	624	364	560	127	391	558	340	356	240	204
12	140	140	705	400	630	153	449	628	418	384	337	293
14	155	155	739	447	710	180	479	660	469	414	456	394
16	178	178	837	460	560	202	550	754	516	500	621	534
18	200	200	950	511	800	230	579	856	621	553	886	771
20	216	216	1054	565	800	230	579	960	621	626	1121	975
24	232	232	1209	664	710	281	750	1094	723	692	1614	1429

Topworks Dimensions — U.S.



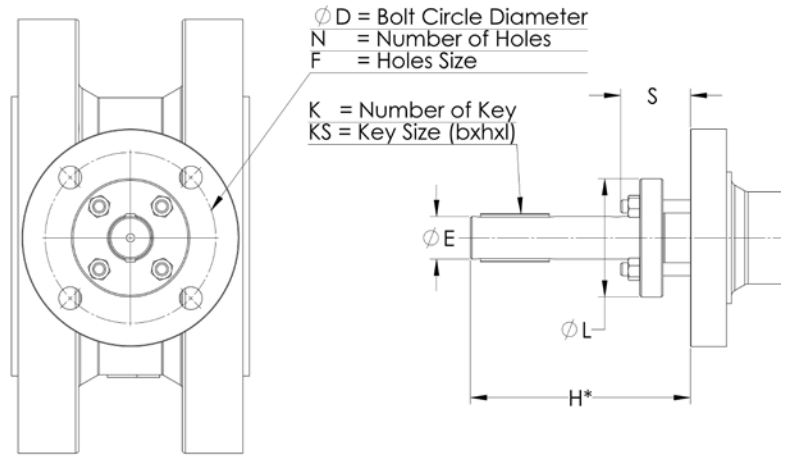
Notes: Dimension "H" will vary depending on Operator Shaft Option. In the table below, H(A) shows dimension for valve with "9" Operator Code (Bare Stem). H(M) shows the dimension for valve with "1" Operator Code (Enclosed Gear).

ASME CLASS 150 (inch dimensions)													
SIZE	ISO Pattern	Ø E	H(A)	H(M)	K	KS (b x h x l)			Ø D	N	F	Ø L	S
3	F07	0.56	3.38	4.38	1	0.19	0.13	1.19	2.76	4	0.35	2.88	1.50
4	F10	0.62	3.96	5.21	1	0.19	0.13	1.25	4.02	4	0.43	3.29	1.50
6	F10	0.62	4.06	4.63	1	0.19	0.13	1.19	4.02	4	0.43	3.29	1.50
8	F12	1.00	5.03	6.25	2	0.25	0.19	1.75	4.92	4	0.51	3.63	1.75
10	F14	1.12	5.90	7.38	2	0.25	0.19	1.75	5.51	4	0.71	4.00	2.50
12	F14	1.37	6.10	7.63	2	0.31	0.25	2.25	5.51	4	0.71	4.00	2.62
14	F16	1.37	6.80	8.50	2	0.31	0.25	2.66	6.50	4	0.87	4.50	2.75
16	F16	1.62	7.00	9.25	2	0.38	0.25	3.07	6.50	4	0.87	4.50	2.62
18	F16	1.87	7.30	9.22	2	0.50	0.38	2.50	6.50	4	0.87	5.25	2.88
20	F25	2.12	7.60	9.50	2	0.50	0.38	3.50	10.00	8	0.71	6.00	2.50
24	F25	2.62	8.20	10.25	2	0.63	0.44	3.50	10.00	8	0.71	6.50	3.25

ASME CLASS 300 (inch dimensions)													
SIZE	ISO Pattern	Ø E	H(A)	H(M)	K	KS (b x h x l)			Ø D	N	F	Ø L	S
3	F10	0.56	3.38	4.38	1	0.19	0.13	1.19	4.02	4	0.43	2.88	1.50
4	F10	0.62	4.30	5.38	1	0.19	0.13	1.25	4.02	4	0.43	3.29	1.50
6	F12	0.87	5.40	6.13	1	0.19	0.13	2.00	4.92	4	0.51	3.38	2.12
8	F14	1.25	5.56	7.30	2	0.25	0.19	1.75	5.51	4	0.67	4.10	1.88
10	F16	1.37	6.80	8.50	2	0.31	0.25	2.75	6.50	4	0.87	4.50	2.50
12	F16	1.62	6.80	8.50	2	0.38	0.25	3.13	6.50	4	0.87	4.50	2.75
14	F25	2.12	7.30	9.13	2	0.50	0.38	3.31	10.00	8	0.71	6.13	2.75
16	F25	2.37	7.60	9.50	2	0.63	0.44	3.50	10.00	8	0.71	6.00	3.75
18	F30	2.62	8.37	9.88	2	0.63	0.44	3.50	11.73	8	0.87	6.50	3.25
20	F30	2.87	10.17	12.42	2	0.75	0.50	4.38	11.73	8	0.87	8.50	4.12
24	F35	3.37	11.11	12.25	2	0.88	0.63	4.75	14.02	8	1.26	8.50	4.62

ASME CLASS 600 (inch dimensions)													
SIZE	ISO Pattern	Ø E	H(A)	H(M)	K	KS (b x h x l)			Ø D	N	F	Ø L	S
3	F10	0.62	3.50	3.88	1	0.19	0.13	1.38	4.02	4	0.43	3.00	1.50
4	F14	1.00	4.60	5.50	1	0.25	0.19	1.25	5.51	4	0.71	3.62	1.88
6	F14	1.12	6.50	7.63	1	0.25	0.19	3.00	5.51	4	0.71	3.88	2.50
8	F16	1.62	6.70	8.38	2	0.38	0.25	3.01	6.50	4	0.87	4.50	2.62
10	F25	2.12	7.30	9.13	2	0.50	0.38	3.37	10.00	8	0.71	6.13	3.25
12	F25	2.25	7.60	9.50	2	0.50	0.38	2.50	10.00	8	0.71	6.00	3.50
14	F30	2.62	8.90	10.90	2	0.63	0.44	4.00	11.73	8	0.87	7.19	3.00
16	F30	2.87	9.50	11.50	2	0.75	0.50	4.38	11.73	8	0.87	8.50	3.62
18	F35	3.37	10.10	12.63	2	0.88	0.63	4.75	14.02	8	1.26	8.50	4.62
20	F40	3.87	11.20	13.88	2	1.00	0.75	4.75	15.98	12	1.50	9.00	5.00
24	F40	4.50	13.60	16.40	2	1.25	0.88	4.88	15.98	8	1.50	10.25	6.00

Topworks Dimensions — Metric



Notes: Dimension "H" will vary depending on Operator Shaft Option. In the table below, H(A) shows dimension for valve with "9" Operator Code (Bare Stem). H(M) shows the dimension for valve with "1" Operator Code (Enclosed Gear).

ASME CLASS 150 (metric dimensions)													
SIZE	ISO Pattern	$\varnothing E$	H(A)	H(M)	K	KS (b x h x l)			$\varnothing D$	N	F	$\varnothing L$	S
3	F07	14	86	111	1	5	3	30	70	4	9	73	38
4	F10	16	101	132	1	5	3	32	102	4	11	83	38
6	F10	16	103	118	1	5	3	30	102	4	11	83	38
8	F12	25	128	159	2	6	5	44	125	4	13	92	44
10	F14	29	150	187	2	6	5	44	140	4	18	102	64
12	F14	35	155	194	2	8	6	57	140	4	18	102	67
14	F16	35	173	216	2	8	6	67	165	4	22	114	70
16	F16	41	178	235	2	10	6	78	165	4	22	114	67
18	F16	48	185	234	2	13	10	64	165	4	22	133	73
20	F25	54	193	241	2	13	10	89	254	8	18	152	64
24	F25	67	208	260	2	16	11	89	254	8	18	165	83

ASME CLASS 300 (metric dimensions)													
SIZE	ISO Pattern	$\varnothing E$	H(A)	H(M)	K	KS (b x h x l)			$\varnothing D$	N	F	$\varnothing L$	S
3	F10	14	86	111	1	5	3	30	102	4	11	73	38
4	F10	16	109	137	1	5	3	32	102	4	11	83	38
6	F12	22	137	156	1	5	3	51	125	4	13	86	54
8	F14	32	141	185	2	6	5	44	140	4	17	104	48
10	F16	35	173	216	2	8	6	70	165	4	22	114	64
12	F16	41	173	216	2	10	6	79	165	4	22	114	70
14	F25	54	185	232	2	13	10	84	254	8	18	156	70
16	F25	60	193	241	2	16	11	89	254	8	18	152	95
18	F30	67	213	251	2	16	11	89	298	8	22	165	83
20	F30	73	258	316	2	19	13	111	298	8	22	216	105
24	F35	86	282	311	2	22	16	121	356	8	32	216	117

ASME CLASS 600 (metric dimensions)													
SIZE	ISO Pattern	$\varnothing E$	H(A)	H(M)	K	KS (b x h x l)			$\varnothing D$	N	F	$\varnothing L$	S
3	F10	16	89	98	1	5	3	35	102	4	11	76	38
4	F14	22	117	140	1	6	5	32	140	4	18	92	48
6	F14	29	165	194	1	6	5	76	140	4	18	98	64
8	F16	41	170	213	2	10	6	76	165	4	22	114	67
10	F25	54	185	232	2	13	10	86	254	8	18	156	83
12	F25	57	193	241	2	13	10	64	254	8	18	152	89
14	F30	67	226	277	2	16	11	102	298	8	22	183	76
16	F30	73	241	292	2	19	13	111	298	8	22	216	92
18	F35	86	257	321	2	22	16	121	356	8	32	216	117
20	F40	98	284	352	2	25	19	121	406	12	38	229	127
24	F40	114	345	417	2	32	22	124	406	8	38	260	152

Flow Coefficients — Shaft Upstream

Valve Size		Class 150, Cv										
NPS	DN	5%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
3	80	4.1	8.2	23.8	44.1	70.8	96.6	116	129	137	140	132
4	100	5.3	16.5	43.1	76.6	120	167	206	234	247	248	228
6	150	19.1	37.9	90.4	172	283	415	550	671	761	807	800
8	200	28.0	72.0	193	340	497	674	873	1093	1305	1411	1411
10	250	62.8	125	297	566	932	1363	1808	2207	2503	2652	2630
12	300	74.0	189	537	851	1157	1558	2088	2728	3372	3788	3808
14	350	125	192	485	872	1326	1899	2650	3581	4574	5319	5240
16	400	170	261	659	1184	1802	2580	3600	4866	6215	7227	7120
18	450	219	336	850	1527	2323	3327	4642	6274	8013	9318	9180
20	500	125	352	1048	1648	2400	3530	5041	6964	9133	10 900	11 368
24	600	423	647	1636	2941	4475	6407	8940	12 083	15 433	17 946	17 680

Valve Size		Class 300, Cv										
NPS	DN	5%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
3	80	4.1	8.2	23.8	44.1	70.8	96.6	116	129	137	140	132
4	100	5.3	16.5	43.1	76.6	120	167	206	234	247	248	228
6	150	15.5	30.8	73.5	140	230	337	447	546	619	655	650
8	200	31.3	62.1	148	282	464	679	900	1099	1247	1321	1310
10	250	58.1	115	275	523	861	1259	1670	2039	2313	2450	2430
12	300	74.0	184	507	804	1071	1462	1990	2615	3270	3676	3673
14	350	114	174	440	790	1202	1721	2402	3246	4146	4822	4750
16	400	152	233	589	1058	1610	2305	3216	4347	5552	6456	6360
18	450	201	308	779	1401	2131	3051	4258	5755	7350	8547	8420
20	500	252	386	976	1755	2670	3823	5335	7210	9209	10709	10550
24	600	275	490	1380	2175	3160	4687	6873	9600	12600	15000	15800

Valve Size		Class 600, Cv										
NPS	DN	5%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
3	80	4.1	8.2	23.8	44.1	70.8	96.6	116	129	137	140	132
4	100	5.3	10.4	24.9	47.4	77.9	114	151	185	209	222	220
6	150	15.0	35.0	93.0	164	259	371	489	587	636	637	590
8	200	25.8	51.2	122	233	383	560	743	907	1029	1090	1081
10	250	41.1	81.5	195	370	609	891	1182	1443	1637	1734	1720
12	300	64.0	165	462	794	1158	1526	1880	2230	2547	2693	2650
14	350	97.3	149	377	677	1030	1475	2058	2782	3553	4131	4070
16	400	107	259	752	1243	1787	2440	3118	3808	4446	4853	4757
18	450	179	274	692	1243	1892	2709	3780	5109	6525	7588	7475
20	500	235	360	910	1635	2488	3562	4970	6718	8581	9978	9830
24	600	305	467	1180	2121	3227	4620	6447	8714	11130	12942	12750

Consult factory for Class 900 and Class 1500 flow coefficients.

Use PerformanceNXT software for complete flow rate, pressure drop, cavitation and noise calculations.

Contact factory for more information.

Flow Coefficients — Shaft Downstream

Valve Size		Class 150, Cv										
NPS	DN	5%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
3	80	4.1	8.2	24.5	44.3	67.6	92.4	115	130	137	138	132
4	100	5.1	16.9	43.7	78.2	116	152	182	205	216	224	223
6	150	19.1	37.9	90.4	172	283	415	550	671	761	807	800
8	200	26.0	74.0	184	325	483	642	814	990	1150	1277	1317
10	250	62.8	125	297	566	932	1363	1808	2207	2503	2652	2630
12	300	69.0	190	519	828	1125	1475	1927	2440	2988	3381	3520
14	350	125	192	485	872	1326	1899	2650	3581	4574	5319	5240
16	400	170	261	659	1184	1802	2580	3600	4866	6215	7227	7120
18	450	219	336	850	1527	2323	3327	4642	6274	8013	9318	9180
20	500	165	382	1077	1767	2451	3487	4844	6672	8701	10 623	11 329
24	600	423	647	1636	2941	4475	6407	8940	12 083	15 433	17 946	17 680

Valve Size		Class 300, Cv										
NPS	DN	5%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
3	80	4.1	8.2	24.5	44.3	67.6	92.4	115	130	137	138	132
4	100	5.1	16.9	43.7	78.2	116	152	182	205	216	224	223
6	150	15.5	30.8	73.5	140	230	337	447	546	619	655	650
8	200	31.3	62.1	148	282	464	679	900	1099	1247	1321	1310
10	250	58.1	115	275	523	861	1259	1670	2039	2313	2450	2430
12	300	88.0	189	503	827	1099	1460	1935	2429	2974	3351	3445
14	350	114	174	440	790	1202	1721	2402	3246	4146	4822	4750
16	400	152	233	589	1058	1610	2305	3216	4347	5552	6456	6360
18	450	201	308	779	1401	2131	3051	4258	5755	7350	8547	8420
20	500	252	386	976	1755	2670	3823	5335	7210	9209	10709	10550
24	600	285	574	1400	2312	3290	4723	6660	9100	11 900	14 500	15 200

Valve Size		Class 600, Cv										
NPS	DN	5%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
3	80	4.1	8.2	24.5	44.3	67.6	92.4	115	130	137	138	132
4	100	5.3	10.4	24.9	47.4	77.9	114	151	185	209	222	220
6	150	12.0	34.0	92.0	165	253	352	458	539	584	595	587
8	200	24.8	49.3	118	224	368	539	715	873	990	1049	1040
10	250	41.1	81.5	195	370	609	891	1182	1443	1637	1734	1720
12	300	54.0	153	448	767	1115	1437	1790	2086	2353	2550	2623
14	350	97.3	149	377	677	1030	1475	2058	2782	3553	4131	4070
16	400	89.0	256	680	1165	1650	2294	2931	3571	4083	4390	4477
18	450	179	274	692	1243	1892	2709	3780	5109	6525	7588	7475
20	500	235	360	910	1635	2488	3562	4970	6718	8581	9978	9830
24	600	305	467	1180	2121	3227	4620	6447	8714	11 130	12 942	12 750

Consult factory for Class 900 and Class 1500 flow coefficients.

Use PerformanceNXT software for complete flow rate, pressure drop, cavitation and noise calculations.

Contact factory for more information.

TX3 Shut-Off Torque

ASME CLASS 150, Torque lbf-in				
NPS	Operating Shutoff Pressure			
	0 psi	75 psi	150 psi	300 psi
3	250	250	250	420
4	386	386	386	769
6	865	865	865	1722
8	1709	1709	1709	3402
10	3636	3636	3636	7229
12	5409	5409	5409	10756
14	6773	6773	6773	13468
16	9409	9409	9409	18712
18	12320	12 320	12 320	24 508
20	15903	15 903	15 903	31 641
24	29 099	29 099	29 099	57 877

ASME CLASS 150, Torque Nm				
NPS	Operating Shutoff Pressure			
	0 bar	5 bar	10 bar	20 bar
3	28	28	28	47
4	44	44	44	87
6	98	98	98	195
8	193	193	193	384
10	411	411	411	817
12	611	611	611	1215
14	765	765	765	1522
16	1063	1063	1063	2114
18	1392	1392	1392	2769
20	1797	1797	1797	3575
24	3288	3288	3288	6539

ASME CLASS 300, Torque lbf-in				
NPS	Operating Shutoff Pressure			
	0 psi	150 psi	300 psi	750 psi
3	300	300	411	1025
4	386	386	769	1829
6	905	905	1801	4489
8	1802	1802	3589	8948
10	3759	3759	7477	18 628
12	5570	5570	11 080	27 609
14	7633	7633	15 187	37 848
16	10 534	10 534	20 964	52 256
18	13 585	13 585	27 039	67 401
20	20 501	20 501	40 783	101 629
24	31 190	31 190	62 062	154 679

ASME CLASS 300, Torque Nm				
NPS	Operating Shutoff Pressure			
	0 bar	10 bar	20 bar	50 bar
3	34	34	46	116
4	44	44	87	207
6	102	102	203	507
8	204	204	406	1011
10	425	425	845	2105
12	629	629	1252	3119
14	862	862	1716	4276
16	1190	1190	2369	5904
18	1535	1535	3055	7615
20	2316	2316	4608	11 483
24	3524	3524	7012	17 476

ASME CLASS 600, Torque lbf-in				
NPS	Operating Shutoff Pressure			
	0 psi	300 psi	750 psi	1500 psi
3	600	600	1072	2141
4	850	850	1908	3813
6	2611	2611	6505	12995
8	5012	5012	12491	24955
10	8489	8489	21 159	42275
12	12 430	12 430	30 985	61910
14	18 608	18 608	46 366	92 628
16	25 005	25 005	62 309	124 483
18	33 124	33 124	82 555	164 939
20	42 717	42 717	106 478	212 746
24	68 107	68 107	169 813	339 323

ASME CLASS 600, Torque Nm				
NPS	Operating Shutoff Pressure			
	0 bar	20 bar	50 bar	100 bar
3	68	68	121	242
4	96	96	216	431
6	295	295	735	1468
8	566	566	1411	2820
10	959	959	2391	4776
12	1404	1404	3501	6995
14	2102	2102	5239	10 466
16	2825	2825	7040	14 065
18	3743	3743	9327	18 636
20	4826	4826	12 030	24 037
24	7695	7695	19 186	38 338

Table values represent maximum torque required to provide shut-off. Additional information may be required for detailed actuator sizing. Torque values are provided for the Shaft Upstream (preferred flow direction) configuration. Values are provided with no factor of safety. Flowserve reserves the right to change the contents without prior notice.

Consult factory for the following:

- Sizing and selection software (PerformanceNXT! or AutoSize)
- Specific actuator sizing guidelines
- Maximum allowable stem torques

Materials of Construction

Item	Description	Carbon Steel Construction	Stainless Steel Construction
1	Body	ASTM A216 Gr WCB	ASTM A351 CF8M
1a	Body Seat	Alloy 21	Alloy 21
2	Seal Ring	Duplex UNS S31803 + Graphite	Duplex UNS S31803 + Graphite
3	Seal Retainer	ASTM A516 Gr 70 or A105	ASTM A240 Type 316 or A182 F316
4	Disc	ASTM A216 Gr WCB	ASTM A351 CF8M
5	Shaft	ASTM A479 UNS S41000	ASTM A564 Type 630 (17-4PH)
7, 31	Keys	UNS S41000	17-4PH
8	Seat Gasket	316 SS + Graphite	316 SS + Graphite
9	Bottom Flange Gasket	316 SS + Graphite	316 SS + Graphite
10	Retainer Screws	ISO 898-1 Gr 10.9	Stainless Steel
11	Bottom Flange	ASTM A216 Gr WCB or A105	ASTM A351 CF8M or A182 F316
12	Bottom Flange Stud	ASTM A193 Gr B7	ASTM A193 Gr B8M
13	Bottom Flange Nut	ASTM A194 Gr 2H	ASTM A194 Gr 8M
14, 15, 16, 27	Bearings	316 SS Nitrided	316 SS Nitrided
17	Bearing Seal	Graphite	Graphite
18, 19, 20	Spacers	316 SS	316 SS
21	Packing	Graphite	Graphite
22	Packing Follower	316 SS	316 SS
23	Gland Flange	ASTM A516 Gr 70	316 SS
24	Packing Stud	ASTM A193 Gr B7	ASTM A193 Gr B8M
25	Packing Nut	ASTM A194 Gr 2H	ASTM A194 Gr 8M
26	Washer	Carbon Steel	Stainless Steel

Refer to Figure 1: Exploded View

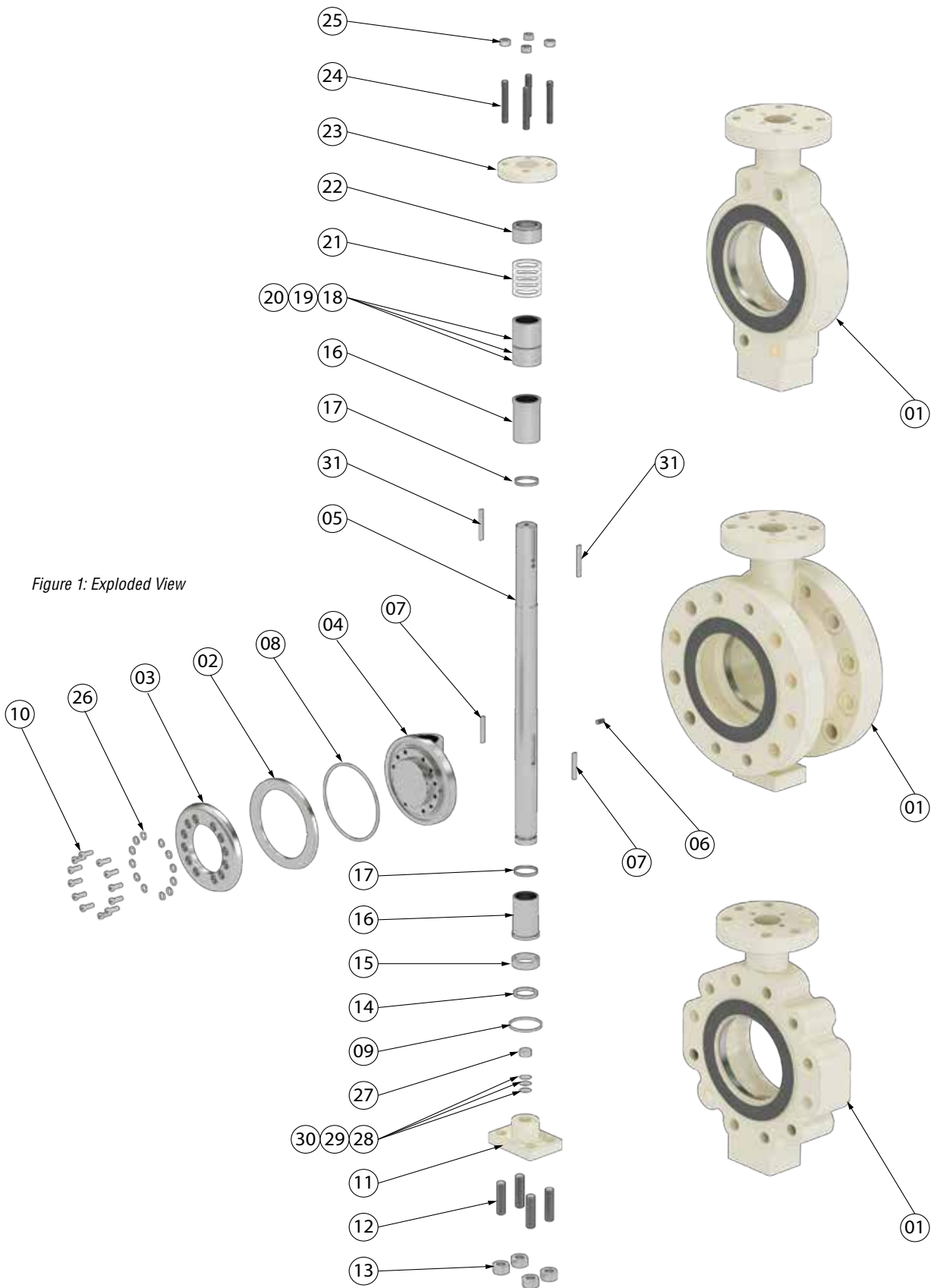


Figure 1: Exploded View

TX3 Model Code (Ordering Information)

Valve Size	-	Model	-	Body Style	End Connection Option	Pressure Class	-	Body Material	Disc Material	Shaft Material	Bearing Material	Packing Style	Packing Material	Seal Ring	Body Seat Surface	-	Operator	Options (two digits) [to be appended as needed]	
3" (DN 80)	03	-																N5	NACE MR0175
4" (DN 100)	04	-																O2	O ₂ Cleaned
6" (DN 150)	06	-																CL	Cl Cleaned
8" (DN 200)	08	-																CR	Cryogenic Stem Extension
10" (DN 250)	10	-																1	Enclosed Gear
12" (DN 300)	12	-																9	Bare Stem
14" (DN 350)	14	-																N	Stellite 21
18" (DN 450)	18	-																S	Stellite 6
20" (DN 500)	20	-																C	Laminated 316 SS / Graphite
24" (DN 600)	24	-																H	Laminated Duplex 31803/ Graphite
	Standard	TX3	-															A	Laminated 304 SS / Graphite
		Flanged (Short)	F															W	Laminated Inconel / Graphite
		Flanged (Long)	G															J	Laminated Monel / Graphite
		Lug	L															K	Laminated Hastelloy / Graphite
		Wafer	W															9	304 SS (Hardface)
		Raised Face	0															1	316 SS (Hardface)
		Flat Face	F															R	XM19 (Hardface)
		RTJ	R															6	Hastelloy
					Cl.150	1	-											T	PTFE V-Ring
					Cl.300	3	-											R	Reinforced (Glass) PTFE V-Ring
					Cl.600	6	-											G	Graphite Rib Braid (Firesafe)
					Cl.900	9	-											Q	Quickset 9001 (Graphite V-Ring)
					Cl.1500	5	-											1	Single Set
								WCB	B									2	Double Set
								LCC	C									3	Live-loaded Single Set
								CF8M	1									4	Live-Loaded Double Set
								CF3M	L									5	Double Set Ported for Vacuum
								Inconel	N									1	316 SS (Nitrided)
								CE3MN	M									B	316 SS (Stellite 6)
								Monel	3									S	Stellite 6
								Hastelloy C	6									4	440C SS
								Alloy 20	2									4	410 SS
								WCB (ENP)	B	R									Nitronic 50
								LCC (ENP)	C	1									17-4 PH
								CF8M	1	N									Inconel
								CF3M	L	3									Monel
								Inconel	N										
								CE3MN	M										
								Monel	3										
								Hastelloy C	6										
								Alloy 20	2										

Example:
08-TX3-F03-B1411TCN-1N5

Refers to an 8 inch TX3 Triple offset Butterfly Valve, with Short Flange, Raised Face, Class 300, Carbon Steel (WCB) Body, Stainless (CF8M) Disc, Stainless (410) Shaft, 316SS Nitrided Bearing, Single Set PTFE V-Ring Packing, Laminated 316SS/Graphite Seal Ring, Stellite 21 Overlay Seat Surface, Gear Operator, with special materials meeting NACE MR0175 requirements.



Notes



Notes

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