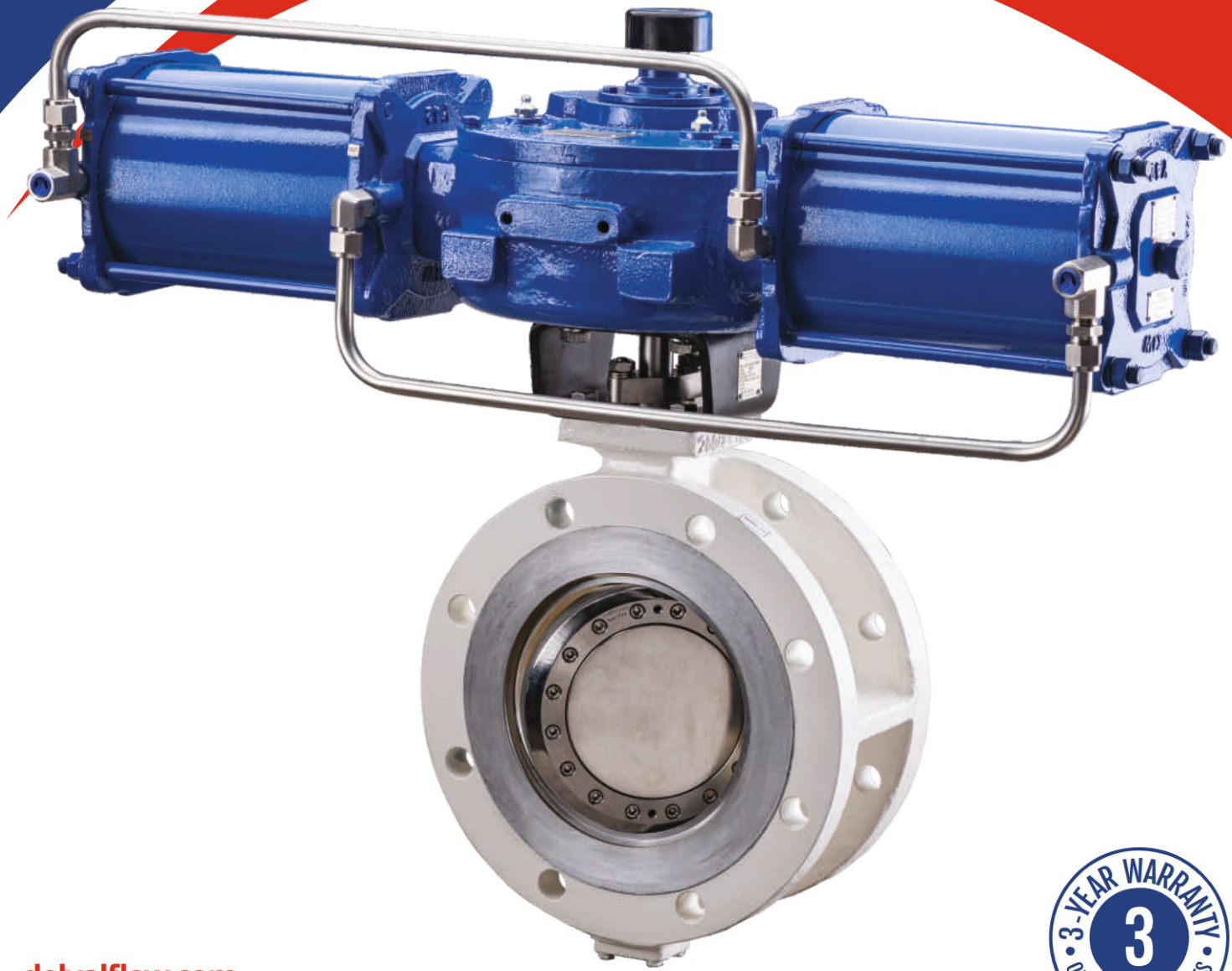
TriO® TRIPLE OFFSET VALVES

Wafer, Lug, Double Flanged and Butt Weld Ends

DelVal®
Flow Controls



3-YEAR WARRANTY
3
ON DELVAL PRODUCTS

delvalflow.com

1-833-DELVAL1

STANDARD FEATURES

Quality & Performance

DelVal Flow Controls provides a wide range of quality products with the reliability you can count on. All TriO® Triple Offset Valves are manufactured in ISO 9001 certified facilities with a robust quality management system and according to ASME B16.34 and API 609 standards.

Design Construction and Features

1. ISO Top Flange
The top flange is drilled as per ISO 5211 to accommodate direct mounting of a wide range of actuators.

2. Stem
Robust single piece stem, secured in stem bearings at drive and non-drive end of the body, supports the disc against the pressure exerted by the fluid and minimizes disc and stem deflection. Stem is positively retained with groove design and retainer ring to prevent accidental blow out.

3. Stem Seal
Stem seal assembly is live loaded with two Belleville Springs. This ensures continuous compression of packing and sealing. Rocker shaped gland bridge compensates for uneven adjustment of gland bolts. Adjustable stem packing with multiple graphite rings seal on high surface finish of the stem and ensures tight sealing, suitable for fugitive emission control.

4. Bearing
Heavy duty bearings are designed to withstand high radial and axial stem loads due to pressure and wear.

5. Disc
Disc is designed with a profile to minimize resistance to flow and pressure drop across the valve and maximize flow capacity.

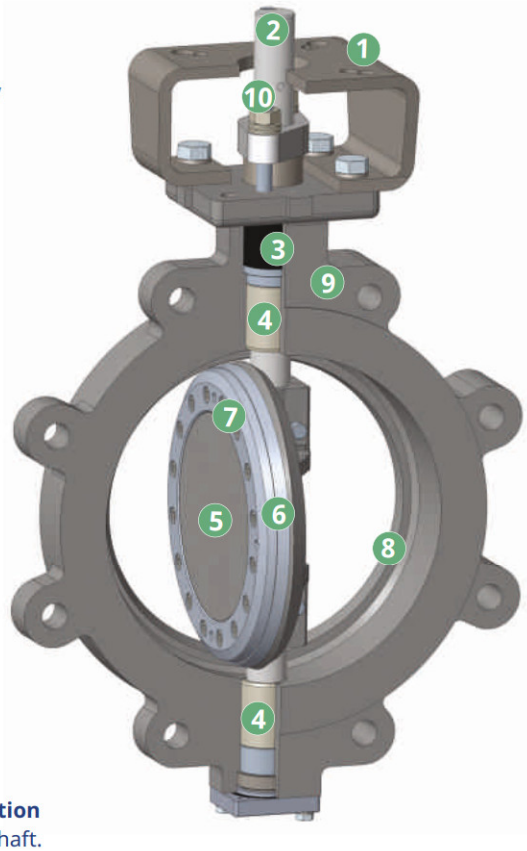
6. Seal Ring
Elliptical laminated seal ring is located on the disc. It is precisioNmachined for bi-directional, bubble tight sealing. Alternating layers of metal and graphite flex generate a circumferential compressive force on the precisioNmachined hard face seat on the body. Metal laminations in duplex stainless steel provide a rigid back up for the soft graphite laminations. This combinatioNmakes the seat suitable for bubble tight sealing at high and low temperatures alike. Seal ring is replaceable.

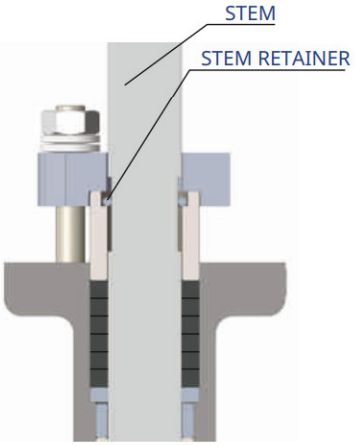
7. Retainer Ring
Seal ring is clamped rigidly on the disc face by the seal ring retainer. The retainer is made of identical metal as the disc and combines the disc, seal ring and retainer into a robust, composite unit for bubble tight, bi-directional sealing.

8. Seat
Seat is integral on body and is hard faced with Stellite® gr.21 or suitable alloy. Seat is precisioNmachined to ensure perfect match with the seal ring. This (a) provides bubble tight seal, (b) excellent durability during seating and unseating, and (c) resistance to erosion during high velocity fluid flow.

9. Body
Body is of single-piece cast construction, with options of wafer, lug, double flanged short or long pattern, or butt weld ends. Face to face dimensions and pressure ratings are conforming to international standards.

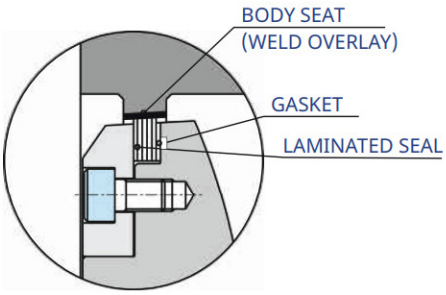
10. External Position Indicator for Disc Position
Disc position is indicated by a dimple on the shaft. When the dimple is in-line with flow axis, the disc is open.



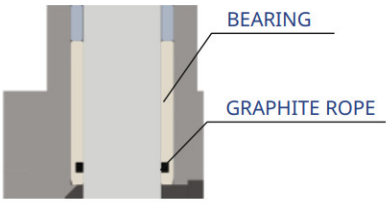


BLOW-OUT PROOF STEM

Valves are equipped with a retaining ring at the top of the stem to prevent movement of top portion of the shaft past the compression ring in case the shaft should break within the valve.



LAMINATED SEAL



BEARING PROTECTOR

Reinforced flexible graphite bearing protectors provide the highest level of protection to the bearings while extending service life.

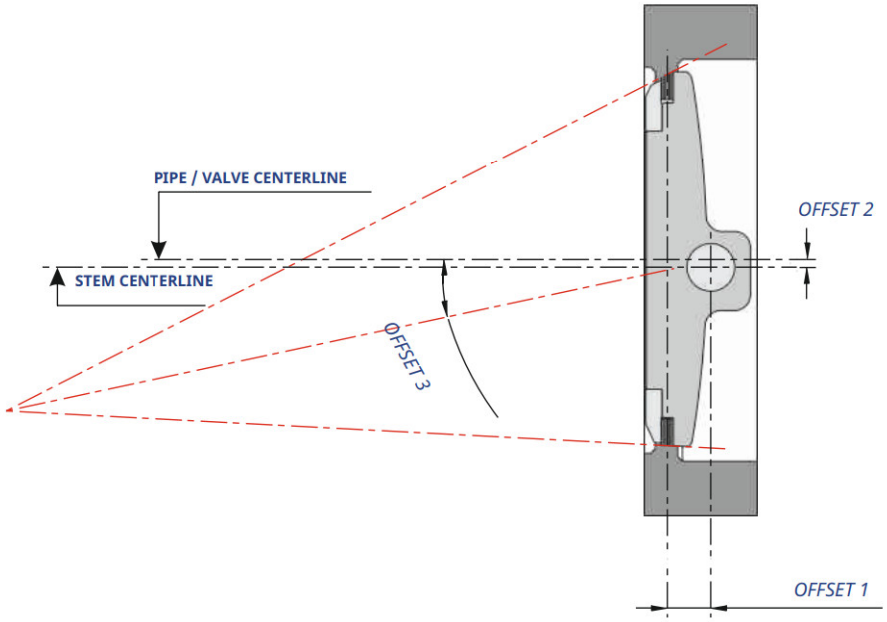
PRINCIPLE OF **OPERATION**

DelVal® TriO® Triple Offset Valves provide bi-directional bubble tight shut-off. This geometry ensures that the disc seal contacts the body seal only at the final shut-off position without rubbing or galling, providing a torque generated resilient seal with sufficient “wedging” to ensure a uniform seal contact.

Offset 1 : The shaft is located with an offset behind the sealing plane allowing complete sealing contact around the entire seat periphery.

Offset 2 : The shaft axis is offset with respect to the pipe and disc centerline providing interference free opening and closing of the valve.

Offset 3 : The seat cone axis is offset from the disc centerline to eliminate friction during opening and closing and to achieve uniform compressive sealing around the entire seat.



Valve Configuration and Options

Cryogenic
Extended stem and bonnets can be offered for low temperature and cryogenic applications. The design for extended stem and bonnet conforms to BS 6364.

High Temperature
Valves are available with stem extensions and fins for high temperature applications.

Steam Jackets
Steam jacketed valves are available for applications where the media tends to crystallize when cooled down.

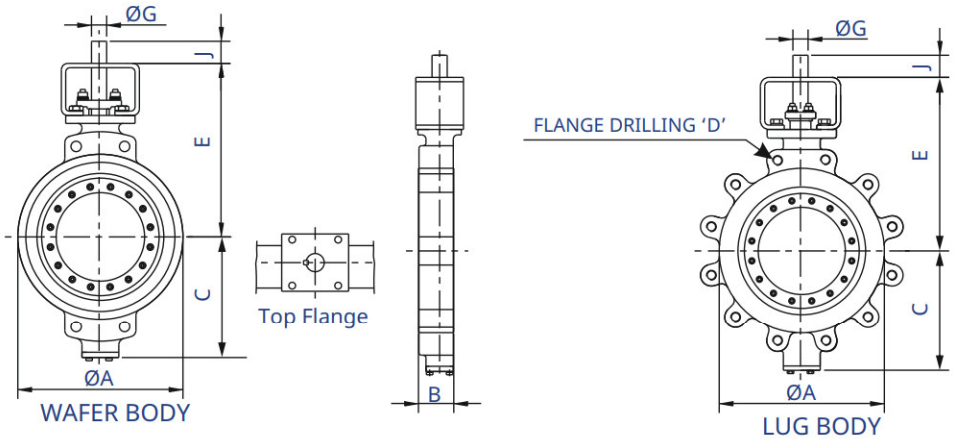
Standards and Specifications

DelVal TriO® Triple Offset Valves are designed and manufactured to meet the requirements of the following industry standards:

Design: API 609, ASME B16.34
Face to Face: API 609, ASME B16.10, ISO 5752, BS EN 558
Testing: API 598, ISO 5208
Pressure Temperature: ASME B16.34
Flange Accommodation: ASME B16.5, ASME B16.47, BS EN 1092-1
Butt Weld Ends: ASME B16.25
NACE: ANSI / ASME MR 0175 / ISO 15156-1

Fire Safe Certified: API 607
Fugitive Emission: ISO 15848
Compliance: PED 2014 / 68/EU
Body Style: Wafer, Lug, Double Flanged (short/long pattern), and Butt Weld End
Rating: Class 150 to class 600
Temp Range: -29°C to 425°C (Standard)
-196°C to 700°C (Optional)
Size Range: DN80 to DN2000

DIMENSIONS AND WEIGHTS



DIMENSIONS (mm)

ASME CLASS 150 WAFER/LUG (SERIES 4A/4B)

Valve Size		ØA	*B	E	C	Top Flange Details			ØG	J	Lug Tapping*				App. Weight (kg)	
INCH	DN					BC	No. of holes	Hole Dia.			Key Size	BC	No. of holes	Tapping/ UNC/UN2B	Wafer	Lug
3	**80**	127	48	190	117	70/102	4	9/11	16	32	5 X 5	152.4	4	5/8-11	9	11
4	**100**	157	54	225	144	70/102	4	9/11	20	32	6 X 6	190.5	8	5/8-11	15	17
6	**150**	216	57	230	155	70/102	4	9/11	22	32	6 X 6	241.3	8	3/4-10	17	20
8	**200**	270	64	285	185	102/125	4	12/14	25	32	8 X 7	298.5	8	3/4-10	26	32
10	**250**	324	71	328	225	125	4	14	30	51	8 X 7	362.0	12	7/8-9	45	52
12	**300**	381	81	380	278	125/165	4	14/22	35	51	10 X 8	431.8	12	7/8-9	70	80
14	**350**	413	92	405	286	140	4	18	40	51	12 X 8	476.3	12	1-8	90	110
16	**400**	470	102	525	342	140/165	4	18/22	50	64	14 X 9	539.8	16	1-8	164	190
18	**450**	534	114	525	349	165	4	22	55	64	16 X 10	577.9	16	1 1/8-8	190	229
20	**500**	584	127	580	394	254	8	18	60	102	18 X 11	635.0	20	1 1/8-8	239	270
24	**600**	692	154	645	450	254	8	18	70	102	20 X 12	749.3	20	1 1/4-8	449	489
28	**700**	800	165	720	520	298	8	22	76.2	102	19.05 X 19.05	863.6	28	1 1/4-8	571	659
30	**750**	857	190	830	559	298	8	22	76.2	102	19.05 X 19.05	914.4	28	1 1/4-8	932	1150
32	**800**	914	190	870	597	298	8	22	101.6	134	25.4 X 19.05	977.9	28	1 1/2-8	1050	1300
36	**900**	1022	203	915	640	356	8	33	101.6	134	25.4 X 19.05	1085.8	32	1 1/2-8	1200	1499
40	**1000**	1124	251	980	699	406	8	39	120	150	32 X 18	1200.2	36	1 1/2-8	1580	1950
42	**1050**	1194	254	1110	823	406	8	39	120	150	32 X 18	1257.3	36	1 1/2-8	1849	2299
44	**1100**	1245	254	1135	833	406	8	39	120	150	32 X 18	1314.4	40	1 1/2-8	2000	2550
48	**1200**	1359	276	1250	841	483	12	39	140	180	36 X 20	1422.4	44	1 1/2-8	2249	2800

ASME CLASS 300 WAFER/LUG (SERIES 4D/4E)

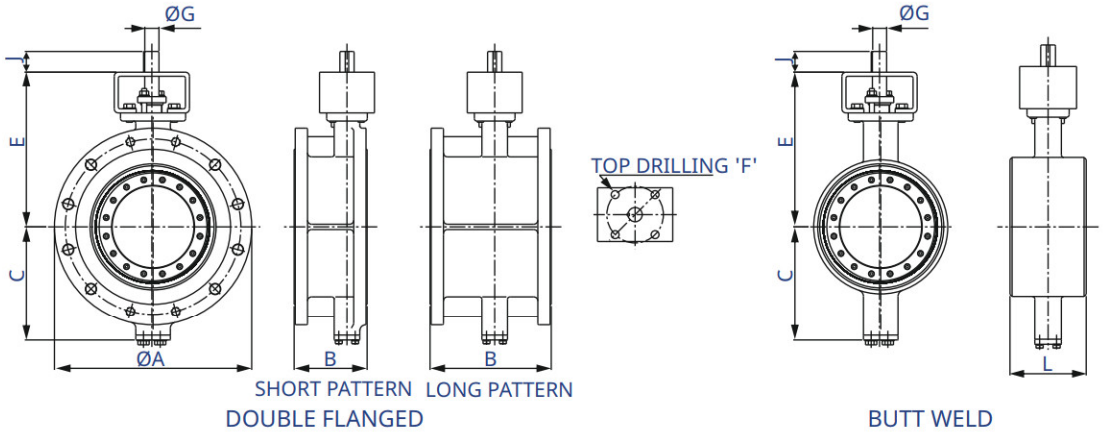
3	**80**	127	48	190	117	70/102	4	10/12	16	32	5 x 5	168.3	8	3/4-10	10	12
4	**100**	157	54	225	144	70/102	4	10/12	20	32	6 x 6	200.0	8	3/4-10	20	25
6	**150**	216	59	275	190	125	4	14	25	32	8 x 7	269.9	12	3/4-10	34	45
8	**200**	270	73	310	205	125	4	14	35	51	10 x 8	330.2	12	7/8-9	50	56
10	**250**	324	83	382	260	165	4	22	35	51	10 x 8	387.4	16	1-8	80	104
12	**300**	381	92	425	285	165	4	22	40	51	12 x 8	450.8	16	1 1/8-8	130	160
14	**350**	413	117	480	315	254	8	18	55	64	16 x 10	514.4	20	1 1/8-8	165	235
16	**400**	470	133	505	360	254	8	18	55	64	16 x 10	571.5	20	1 1/4-8	225	360
18	**450**	534	149	585	390	298	8	22	70	102	20 x 12	628.6	24	1 1/4-8	342	494
20	**500**	584	159	650	422	298	8	22	88.9	134	22.23 x 15.88	685.8	24	1 1/4-8	390	556
24	**600**	692	181	750	516	356	8	33	101.6	134	25.4 x 19.05	812.8	24	1 1/2-8	665	800

ASME CLASS 600 WAFER/LUG (SERIES 4G/4H)

3	**80**	146	54	235	136	125	4	14	30	51	8 x 7	168.3	8	3/4-10	14	18
4	**100**	175	64	300	185	125	4	14	30	51	8 x 7	215.9	8	7/8-9	26	30
6	**150**	241	78	315	194	165	4	22	35	51	10 x 8	292.1	12	1-8	62	70
8	**200**	302	102	405	263	165	4	22	40	51	12 x 8	349.2	12	1 1/8-8	90	100
10	**250**	350	117	485	328	254	8	18	50	64	14 x 9	431.8	16	1 1/4-8	132	185
12	**300**	413	140	535	365	254	8	18	55	64	16 x 10	489.0	20	1 1/4 -8	220	254
14	**350**	457	155	610	390	298	8	22	70	102	20 X 12	527.0	20	1 3/8-8	282	324
16	**400**	508	178	665	438	298	8	22	88.9	120	22.23 x 15.88	603.2	20	1 1/2-8	450	514
18	**450**	575	200	710	460	356	8	33	88.9	120	22.23 x 15.88	654.0	20	1 5/8 -8	550	629
20	**500**	635	216	795	526	356	8	33	101.6	134	25.4 X 19.05	723.9	24	1 5/8 -8	690	800
24	**600**	749	232	885	623	356	8	33	120	150	32 X 18	838.2	24	1 7/8-8	1085	1239

* Face to Face for sizes up to 24" Class 150 and 300 confirms to API 609 and Flange dimensions are shown as per ASME B16.5 Class 150 upto 24" and 26" & above as per ASME B16.47 Class 150 Series A. Please consult Delval for other dimensions

DIMENSIONS AND WEIGHTS



SHORT PATTERN LONG PATTERN
DOUBLE FLANGED

BUTT WELD

DIMENSIONS (mm) ASME CLASS 150 SHORT PATTERN/LONG PATTERN/BUTT WELD (SERIES 4C/4P/4W)

Valve Size		ØA	B*		L*	E	C	Top Flange Details			ØG	J	Key Size	Lug Tapping*			App. Weight (kg)		
INCH	DN		SP	LP				BC	No. of	Hole Dia.				BC	No. of holes	Tapping /UNC/UN2B	DF (SP)	DF (LP)	BW
3	80	190	114	203	180	190	117	70/102	4	9/11	16	32	5 X 5	152.4	4	5/8-11	18	19	11
4	100	230	127	229	190	225	142	70/102	4	9/11	20	32	6 X 6	190.5	8	5/8-11	28	29	15
6	150	280	140	267	210	230	155	70/102	4	9/11	22	32	6 X 6	241.3	8	3/4-10	38	42	27
8	200	345	152	292	230	285	185	102/125	4	12/14	25	32	8 X 7	298.5	8	3/4-10	55	60	55
10	250	405	165	330	250	328	224	125	4	14	30	51	8 X 7	362	12	7/8-9	90	100	82
12	300	485	178	356	270	380	277	125/165	4	14/22	35	51	10 X 8	431.8	12	7/8-9	152	166	102
14	350	535	190	381	290	405	284	140	4	18	40	51	12 X 8	476.3	12	1-8	195	213	147
16	400	595	216	406	310	525	333	140/165	4	18/22	50	64	14 X 9	539.8	16	1-8	270	295	241
18	450	635	222	432	330	525	343	165	4	22	55	64	16 X 10	577.9	16	1 1/8-8	295	328	274
20	500	700	229	457	350	580	394	254	8	18	60	102	18 X 11	635	20	1 1/8-8	424	467	315
24	600	815	267	508	390	645	450	254	8	18	70	102	20 X 12	749.3	20	1 1/4-8	600	661	476
28	700	925	292	610	-	720	518	298	8	22	76.2	102	19.05 X 19.05	863.6	28	1 1/4-8	871	975	-
30	750	985	318	610	-	830	559	298	8	22	76.2	102	19.05 X 19.05	914.4	28	1 1/4-8	1380	1586	-
32	800	1060	318	660	-	870	597	298	8	22	101.6	134	25.4 X 19.05	977.9	28	1 1/2-8	1560	1794	-
36	900	1170	330	711	-	915	640	356	8	33	101.6	134	25.4 X 19.05	1085.8	32	1 1/2-8	1874	2160	-
40	1000	1290	410	-	-	980	696	406	8	39	120	150	32 X 18	1200.2	36	1 1/2-8	2429	-	-
42	1050	1345	410	-	-	1110	823	406	8	39	120	150	32 X 18	1257.3	36	1 1/2-8	2874	-	-
44	1100	1405	470	-	-	1135	833	406	8	39	120	150	32 X 18	1314.4	40	1 1/2-8	3179	-	-
48	1200	1510	470	-	-	1250	841	483	12	39	140	180	36 X 20	1422.4	44	1 1/2-8	3499	-	-

ASME CLASS 300 SHORT PATTERN/LONG PATTERN/BUTT WELD (SERIES 4F/4Q/4Y)

3	80	210	114	282	180	190	117	70/102	4	10/12	16	32	5 x 5	168.3	8	3/4-10	18	20	11
4	100	255	127	305	190	225	144	70/102	4	10/12	20	32	6 x 6	200	8	3/4-10	32	36	15
6	150	320	140	403	210	275	190	125	4	14	25	32	8 x 7	269.9	12	3/4-10	84	95	36
8	200	380	152	418	230	310	205	125	4	14	35	51	10 x 8	330.2	12	7/8-9	100	117	68
10	250	445	165	457	250	382	260	165	4	22	35	51	10 x 8	387.4	16	1-8	130	154	98
12	300	520	178	502	270	425	285	165	4	22	40	51	12 x 8	450.8	16	1 1/8-8	224	257	136
14	350	585	190	762	290	480	315	254	8	18	55	64	16 x 10	514.4	20	1 1/8-8	310	372	191
16	400	650	216	838	310	505	360	254	8	18	55	64	16 x 10	571.5	20	1 1/4-8	405	544	346
18	450	710	222	914	330	585	390	298	8	22	70	102	20 x 12	628.6	24	1 1/4-8	525	744	450
20	500	775	229	991	350	650	422	298	8	22	88.9	134	22.23 x 15.88	685.8	24	1 1/4-8	663	957	553
24	600	915	267	1143	390	750	516	356	8	33	101.6	134	25.4 x 19.05	812.8	24	1 1/2-8	954	1434	862

ASME CLASS 600 SHORT PATTERN/LONG PATTERN/BUTT WELD (SERIES 4J/4R/4K)

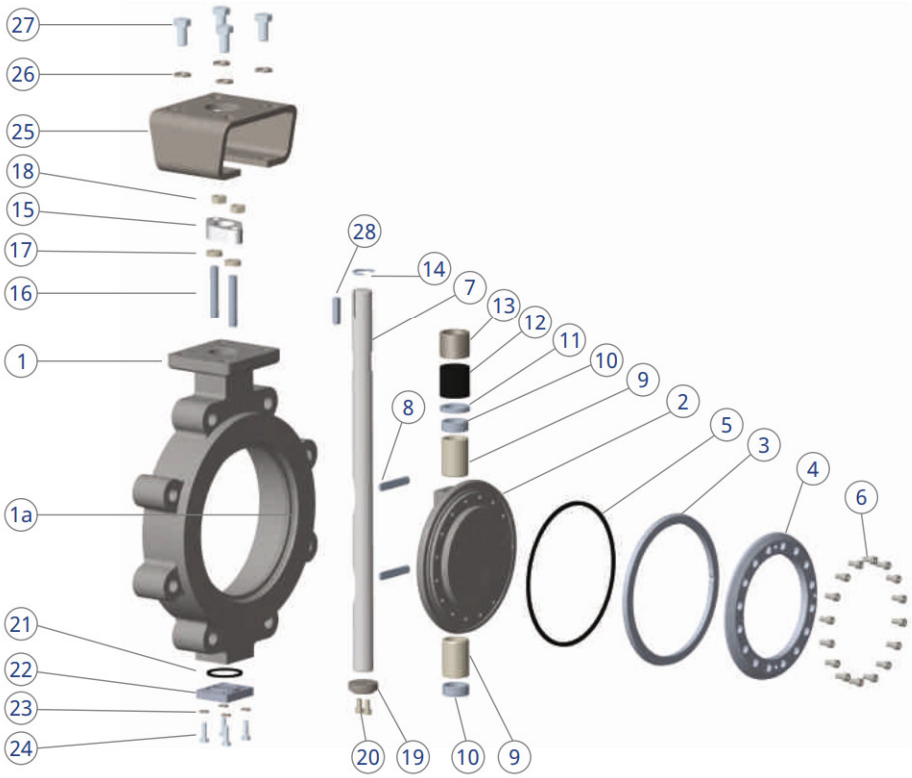
3	80	210	180	356	180	235	136	125	4	14	30	51	8 x 7	168.3	8	3/4-10	41	45	29
4	100	275	190	432	190	300	185	125	4	14	30	51	8 x 7	215.9	8	7/8-9	65	70	59
6	150	355	210	559	210	315	194	165	4	22	35	51	10 x 8	292.1	12	1-8	132	147	82
8	200	420	230	660	230	405	263	165	4	22	40	51	12 x 8	349.2	12	1 1/8-8	160	188	122
10	250	510	250	787	250	485	328	254	8	18	50	64	14 x 9	431.8	16	1 1/4-8	266	317	218
12	300	560	270	838	270	535	365	254	8	18	55	64	16 x 10	489	20	1 1/4 -8	365	422	295
14	350	605	290	889	290	610	390	298	8	22	70	102	20 x 12	527	20	1 3/8-8	489	554	549
16	400	685	310	991	310	665	438	298	8	22	88.9	120	22.23 x 15.88	603.2	20	1 1/2-8	698	862	646
18	450	745	330	1092	330	710	460	356	8	33	88.9	120	22.23 x 15.88	654	20	1 5/8 -8	734	970	816
20	500	815	350	1194	350	795	526	356	8	33	101.6	134	25.4 X 19.05	723.9	24	1 5/8 -8	869	1202	1179
24	600	940	390	1397	390	885	623	356	8	33	120	150	32 X 18	838.2	24	1 7/8-8	1419	1973	1769

* Face to Face dimension 'B' for short pattern conforms to API 609 Category B, and long pattern conforms to API 609 Category B / ASME B16.10 gate valves.

End to End dimension 'L' conforms to ISO 5752 Series 14. Flange dimensions are shown as per ASME B16.5 Class 150 upto 24" and 26" & above as per ASME B16.47 Class 150 Series A.

Please consult Delval for other dimensions. DelVal reserves rights to change the contents without notice.

STANDARD MATERIALS OF CONSTRUCTION



Part List

Item	Description	Standard Material *	
		Carbon steel	Stainless steel
1	Body	ASTM A216 WCB / WCC, ASTM A352 LCC	ASTM A351 CF8M / CF3M
1a	Body Seat	Stellite® gr. 21	Stellite® gr. 21
2	Disc	ASTM A216 WCB / WCC, ASTM A352 LCC	ASTM A351 CF8M / CF3M
3**	Seal Ring	ASTM A 240 S31803 (Duplex) + Graphite ASTM A 240 S20910 (XM-19) + Graphite ASTM A 693 Type 630 (17-4PH) hard faced ASTM A 240 S20910 (XM-19) hard faced	ASTM A 240 S31803 (Duplex) + Graphite ASTM A 240 S20910 (XM-19) + Graphite ASTM A 693 Type 630 (17-4PH) hard faced ASTM A 240 S20910 (XM-19) hard faced
4	Retainer Ring	ASTM A516 Gr.70 / ASTM A240 SS304	ATM A240 SS316 / SS316L
5**	Seal Gasket	Graphite	Graphite
6	Retainer Screw	ISO 3506 A4-70	ISO 3506 A4-70
7	Stem	ASTM A322 4130 ASTM A479 SS410 –cond.3 ASTM A564 Type 630 (17-4PH)	ASTM A564 Type 630 (17-4PH) / ASTM A479 Xm19
8**	Wedge Key	ASTM A322 4130 ASTM A479 SS410 –cond.3 ASTM A564 Type 630 (17-4PH)	ASTM A564 Type 630 (17-4PH) / ASTM A479 Xm19
9**	Stem Bearing + Protector	ASTM A 479 SS316 / SS316L hard faced + Graphite	ASTM A 479 SS316 / SS316L hard faced + Graphite
10	Bearing Spacer	ASTM A 479 SS316 / SS316L	ASTM A 479 SS316 / SS316L
11	Packing Spacer	ASTM A 479 SS316 / SS316L	ASTM A 479 SS316 / SS316L
12**	Gland Packing	Graphite	Graphite
13	Gland	ASTM A 479 SS316 / SS316L	ASTM A 479 SS316 / SS316L
14	Stem Retainer	ASTM A313 SS302	ASTM A313 SS302

Item	Description	Standard Material*	
		Carbon steel	Stainless steel
15	Gland Flange	ASTM A516 Gr.70 / ASTM A240 SS304	ASTM A240 SS316
16	Stud	ASTM A193 Gr B8M	ASTM A193 Gr B8M
17**	Belleville Spring	ASTM A 240 SS 304	ASTM A 240 SS 304
18	Hex Nut	ASTM A194 Gr 8M	ASTM A194 Gr 8M
19**	Thrust Bearing	ASTM A 479 SS316 / SS316L hard faced	ASTM A 479 SS316 / SS316L hard faced
20	Bearing Screw	ISO 3506 A4 -70	ISO 3506 A4 -70
21**	Cover Gasket	Graphite , ASTM A 240 SS316 / SS316L + Graphite	Graphite , ASTM A 240 SS316 / SS316L + Graphite
22	Bottom Cover	ASTM A516 Gr.70 / ASTM A240 SS304	ASTM A240 SS316 / SS316L
23	Punch Washer	ASTM A 240 SS304	ASTM A 240 SS304
24	Hex Hd Screw	ISO 3506 A4 -70	ISO 3506 A4 -70
25	Bracket	Carbon steel	Carbon steel
26	Punch Washer	ASTM A 240 SS304	ASTM A 240 SS304
27	Hex Hd Screw	ISO 3506 A4 -70	ISO 3506 A4 -70
28	Key	ASTM A322 4130 ASTM A479 SS410 –cond.3 ASTM A564 Type 630 (17-4PH)	ASTM A564 Type 630 (17-4PH) / ASTM A479 Xm19

*Other materials may be available on request.
**Recommended spares

TORQUE DATA

ASME CLASS 150

Valve Size		Running Torque (Nm)	*Flow Direction	Torque at various Differential Pressure (Nm)					
				PN10		PN16		PN20	
INCH	DN			ETC	BTO	ETC	BTO	ETC	BTO
3	80	35	Shaft Side	85	106	90	112	94	118
			Disc Side	117	93	123	99	130	104
4	100	46	Shaft Side	108	135	115	144	122	153
			Disc Side	149	119	158	126	168	135
6	150	79	Shaft Side	186	233	201	251	211	264
			Disc Side	256	205	277	221	290	232
8	200	120	Shaft Side	264	330	304	380	320	400
			Disc Side	363	290	418	334	440	352
10	250	275	Shaft Side	558	698	685	857	734	918
			Disc Side	767	614	942	754	1010	808
12	300	355	Shaft Side	662	827	823	1028	946	1182
			Disc Side	910	728	1131	905	1300	1040
14	350	470	Shaft Side	962	1202	1183	1479	1254	1568
			Disc Side	1322	1058	1627	1302	1725	1380
16	400	529	Shaft Side	1499	1874	1940	2426	2117	2646
			Disc Side	2062	1649	2668	2134	2911	2328
18	450	723	Shaft Side	1870	2338	2423	3029	2890	3613
			Disc Side	2572	2057	3331	2665	3974	3179
20	500	818	Shaft Side	2452	3065	3467	4334	3636	4545
			Disc Side	3372	2697	4767	3814	5000	4000
24	600	1050	Shaft Side	3977	4971	5113	6391	5600	7000
			Disc Side	5468	4374	7030	5624	7700	6160
26	650	1800	Shaft Side	7086	8857	8760	10950	9600	12000
			Disc Side	9743	7794	12045	9636	13200	10560
28	700	2100	Shaft Side	8447	10558	11200	14000	11200	14000
			Disc Side	11614	9291	15400	12320	15400	12320
30	750	2496	Shaft Side	11243	14054	14571	18214	16640	20800
			Disc Side	15459	12368	20035	16028	22880	18304
32	800	2768	Shaft Side	11813	14766	15277	19096	17320	21650
			Disc Side	16243	12994	21006	16805	23815	19052
36	900	3275	Shaft Side	16749	20937	24563	30703	26200	32750
			Disc Side	23030	18424	33773	27019	36025	28820
40	1000	4285	Shaft Side	22553	28191	30311	37888	34280	42850
			Disc Side	31010	24808	41677	33342	47135	37708
42	1050	4386	Shaft Side	25191	31489	31174	38968	35088	43860
			Disc Side	34638	27711	42865	34292	48246	38597
44	1100	4750	Shaft Side	26878	33598	35034	43793	38000	47500
			Disc Side	36957	29566	48172	38538	52250	41800
48	1200	5446	Shaft Side	38046	47558	49460	61825	54352	67940
			Disc Side	52314	41851	68008	54406	74734	59787

*The preferred direction of flow is through the shaft side.

ASME CLASS 300

Valve Size		Running Torque (Nm)	*Flow Direction	Torque at various Differential Pressure (Nm)									
				PN10		PN20		PN30		PN40		PN50	
INCH	DN			ETC	BTO	ETC	BTO	ETC	BTO	ETC	BTO	ETC	BTO
3	80	77	Shaft Side	140	175	153	191	166	207	179	223	204	255
			Disc Side	193	154	210	168	228	182	245	196	281	224
4	100	94	Shaft Side	174	217	195	244	212	265	239	298	250	312
			Disc Side	239	191	269	215	291	233	328	263	343	275
6	150	169	Shaft Side	289	361	329	412	361	451	397	496	451	564
			Disc Side	397	318	453	362	496	397	546	437	620	496
8	200	350	Shaft Side	585	731	689	861	802	1002	896	1120	990	1238
			Disc Side	804	643	947	757	1102	882	1232	986	1362	1089
10	250	429	Shaft Side	785	981	1032	1290	1208	1510	1323	1654	1411	1764
			Disc Side	1079	863	1419	1135	1661	1329	1819	1455	1940	1552
12	300	569	Shaft Side	1058	1322	1396	1745	1819	2274	2116	2644	2285	2856
			Disc Side	1454	1164	1920	1536	2502	2001	2909	2327	3142	2513
14	350	723	Shaft Side	1445	1806	1886	2358	2247	2809	2729	3411	2970	3712
			Disc Side	1986	1589	2593	2075	3090	2472	3752	3002	4083	3267
16	400	814	Shaft Side	2433	3042	3216	4019	4041	5052	4867	6084	5475	6845
			Disc Side	3346	2677	4421	3537	5557	4445	6692	5354	7528	6023
18	450	930	Shaft Side	3244	4055	4379	5474	5271	6589	6325	7907	7461	9327
			Disc Side	4460	3568	6021	4817	7248	5798	8698	6958	10259	8207
20	500	1148	Shaft Side	3675	4594	4928	6160	6515	8143	7851	9814	9187	11485
			Disc Side	5053	4042	6776	5420	8958	7166	10795	8636	12632	10106
24	600	1787	Shaft Side	5466	6832	6979	8724	9249	11562	12108	15135	14294	17869
			Disc Side	7515	6012	9596	7677	12718	10174	16649	13319	19655	15724

ASME CLASS 600

Valve Size		Running Torque (Nm)	*Flow Direction	Torque at various Differential Pressure (Nm)									
				PN30		PN40		PN60		PN80		PN100	
INCH	DN			ETC	BTO	ETC	BTO	ETC	BTO	ETC	BTO	ETC	BTO
3	80	142	Shaft Side	175	219	204	255	248	310	292	365	379	474
			Disc Side	241	193	281	225	341	273	401	321	521	417
4	100	241	Shaft Side	297	371	346	433	421	526	495	618	643	804
			Disc Side	408	327	476	381	578	463	680	544	884	708
6	150	504	Shaft Side	620	775	724	905	879	1098	1034	1292	1344	1680
			Disc Side	853	682	995	796	1208	967	1422	1137	1848	1478
8	200	902	Shaft Side	1145	1431	1317	1646	1603	2004	1889	2362	2405	3006
			Disc Side	1575	1260	1811	1449	2204	1764	2598	2078	3307	2645
10	250	1542	Shaft Side	1785	2232	2056	2570	2489	3111	3030	3787	4112	5140
			Disc Side	2455	1964	2827	2261	3422	2738	4166	3333	5654	4523
12	300	2023	Shaft Side	2643	3303	3138	3923	3799	4748	4514	5643	5395	6745
			Disc Side	3633	2907	4315	3452	5223	4179	6207	4966	7418	5935
14	350	2891	Shaft Side	3495	4368	4420	5525	5499	6874	6475	8094	7709	9637
			Disc Side	4805	3844	6077	4862	7561	6049	8904	7123	10600	8480
16	400	2955	Shaft Side	5138	6423	7091	8863	9146	11432	9968	12460	11818	14773
			Disc Side	7065	5652	9750	7800	12575	10060	13706	10965	16249	12999
18	450	4319	Shaft Side	7113	8892	9552	11940	12194	15243	14735	18418	17275	21596
			Disc Side	9781	7825	13134	10507	16767	13414	20260	16208	23753	19003
20	500	4694	Shaft Side	8642	10803	11920	14901	14901	18626	17881	22351	20861	26078
			Disc Side	11883	9507	16391	13113	20488	16391	24586	19669	28684	22947
24	600	6535	Shaft Side	14520	18150	20328	25410	24878	31097	29524	36905	34848	43564
			Disc Side	19965	15972	27951	22361	34207	27365	40595	32476	47916	38333

Operator Information

All valves can be direct mounted with gear operators for manual operation. Gear operators can also be attached with chainwheel operators for opening or closing valves located on pipelines at high elevations.

All valves can be direct mounted with pneumatic actuators or electric actuators and accessories for complete automation options such as fail open/close and positioner controlled. Valves can be mounted with manual overrides.

100% TESTING
100% SERIALIZATION

3-YEAR WARRANTY ON DELVAL PRODUCTS

CERTIFICATES

QUALITY ASSURANCE MANAGEMENT ISO 9001
ENVIROMENTAL MANAGEMENT ISO 14001
OCCUPATIONAL HEALTH & SAFETY OHSAS 18001
BUTTERFLY VALVES CAT. A & B API 609 CAT A&B
EXIDA CERTIFIED - IEC 61508 SIL3
DIRECTIVE 2014/68/EU ANNEX III MODULE B PED CERTIFIED

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