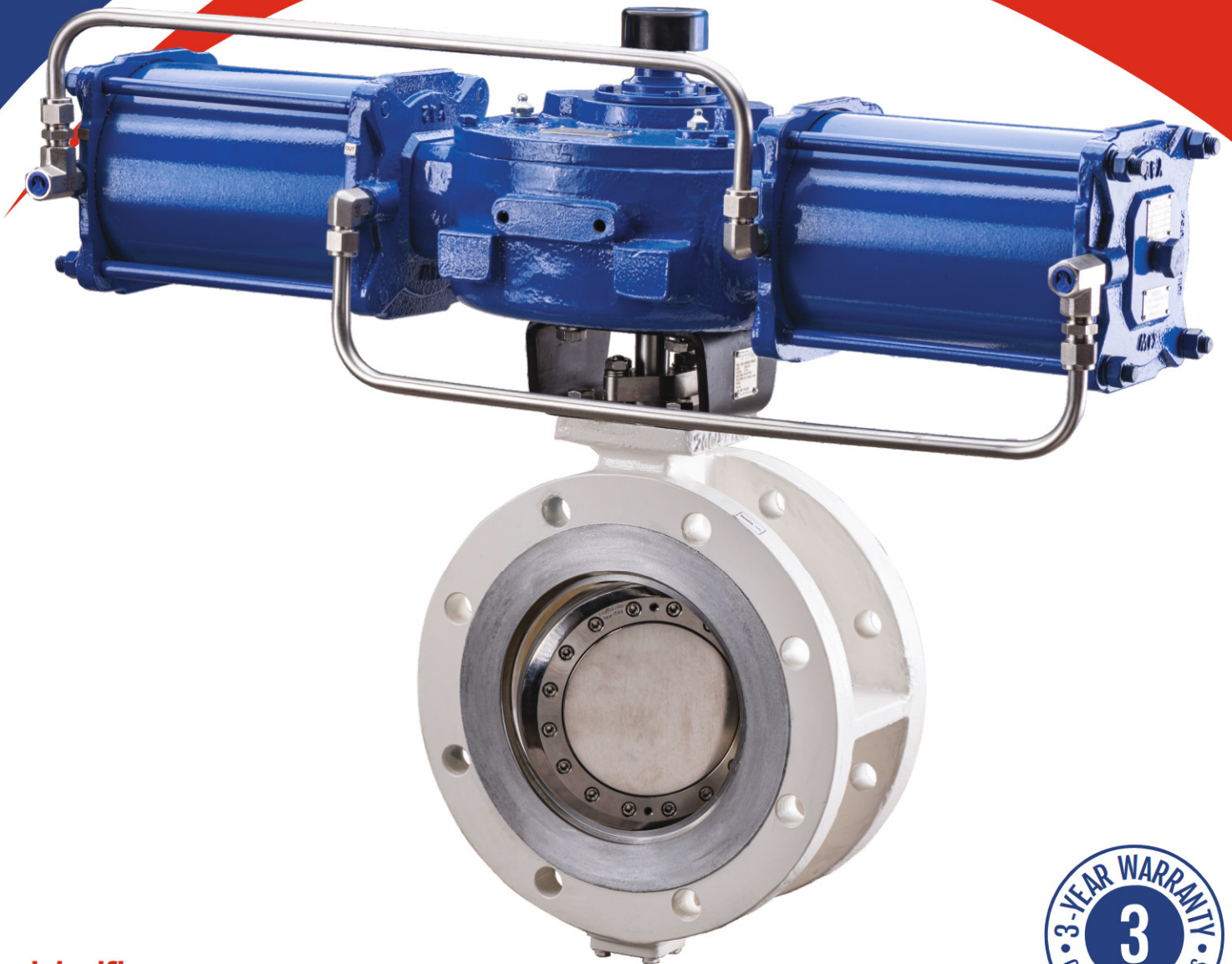


# TrīO™ TRIPLE OFFSET VALVES

Wafer, Lug, Double Flanged  
and Butt Weld Ends



[delvalflow.com](http://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 stem retainer to prevent accidental blow out.

### 3. Stem Seal

Stem seal assembly is live loaded with 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 precision machined for bi-directional, zero leakage sealing. Alternating layers of metal and graphite flex generate a circumferential compressive force on the precision machined hard face seat on the body. Metal laminations in duplex stainless steel provide a rigid back up for the soft graphite laminations. This combination makes the seal suitable for zero leakage 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 retainer ring. The retainer is made of identical metal as the disc and combines the disc, seal ring and retainer into a robust, composite unit for zero leakage, bi-directional sealing.

### 8. Seat

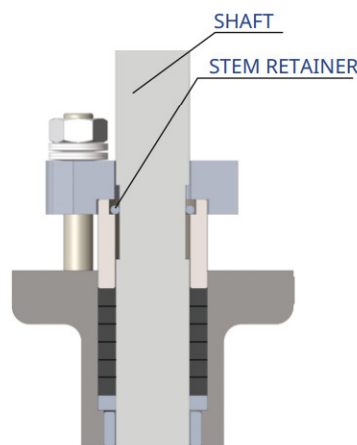
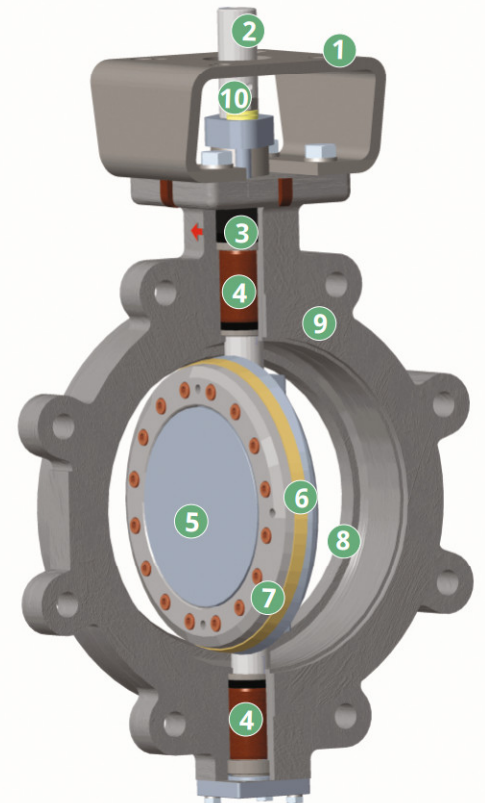
Seat is integral on body and is hard faced with Stellite® gr.21 or suitable alloy. Seat is precision machined to ensure perfect match with the seal ring. This (a) provides bubble tight seal, (b) excellent durability during seating and unseating, and (c) resistance to erosion during high velocity fluid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

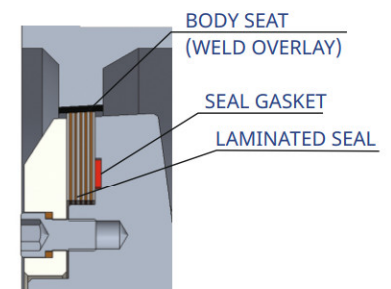
### 10. External Position Indicator for Disc Position

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

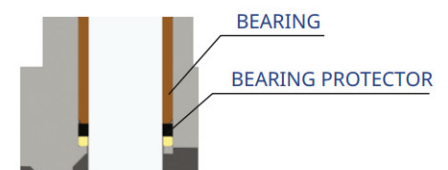


BLOW-OUT PROOF SHAFT

Valves are equipped with a shaft retainer at the top of the shaft to prevent movement of top portion of the shaft past the gland in case the shaft should break within the valve.



LAMINATED SEAL



BEARING PROTECTOR

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



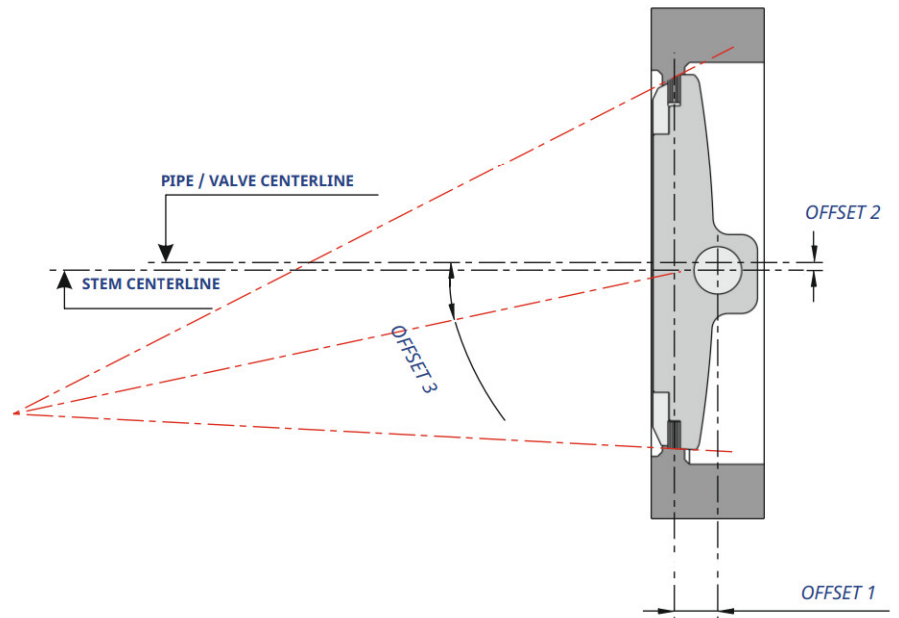
# PRINCIPLE OF OPERATION

DelVal® TrIO™ Triple Offset Valves provide bi-directional zero leakage. This geometry ensures that the disc seal contacts the body seat only at the final shut-off position without rubbing or galling, providing a torque generated resilient seat 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, BS EN 593, MSS SP-68

**Face to Face:** API 609, ISO 5752, BS EN 558, MSS SP-68

**Testing:** API 598, ISO 5208, EN 12266, MSS SP-68

**Pressure Temperature:** ASME B16.34

**Flange Accommodation:** ASME B16.5, ASME B16.47, BS EN 1092-1, AWWA C207

**Butt Weld Ends:** ASME B16.25

**NACE:** MR 0175 / ISO 15156

**Fire Safe Certified:** API 607

**Fugitive Emission (Optional):** ISO 15848, API 641

**CE Compliance:** 2014/68/EU (PED)

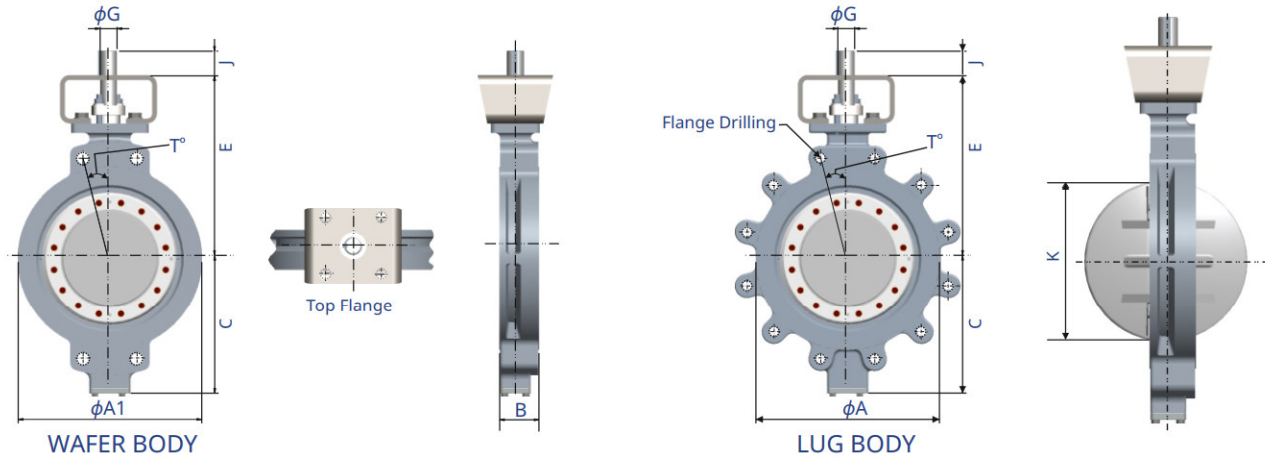
**Body Style:** Wafer, Lug, Double Flanged (short / long pattern), and Butt Weld End

**Rating:** Class 150 to class 900

**Temp Range:** -20°F to 800°F (Standard)  
-320°F to 1290°F (Optional)

**Size Range:** 3" to 102"

# DIMENSIONS AND WEIGHTS



## DIMENSIONS (Inch)

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

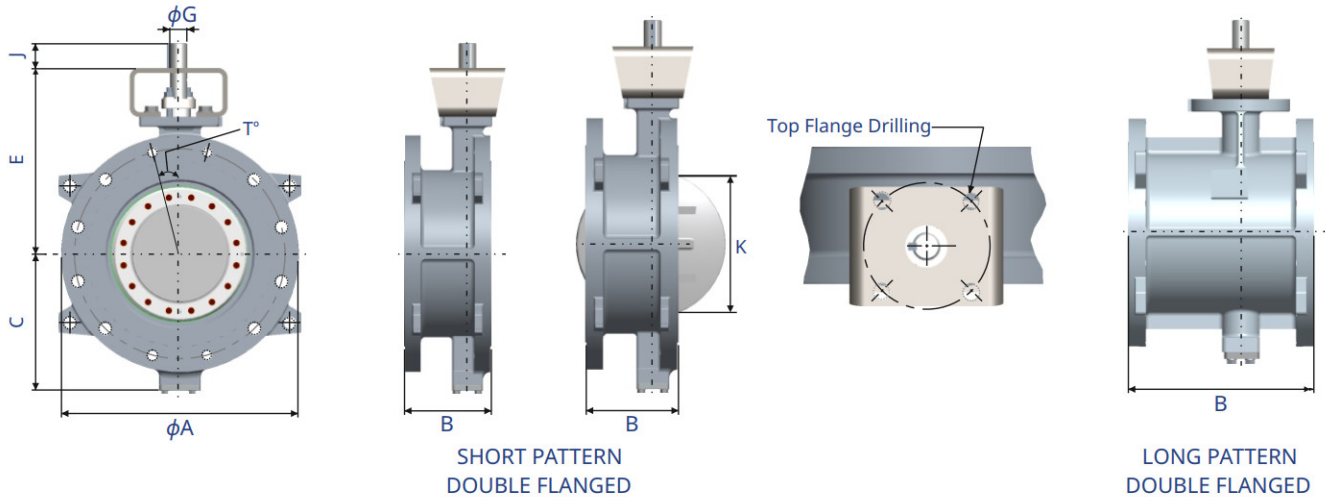
Valve Size		$\phi A$	$\phi A1$	B	C	E	Top Flange Details	$\phi G$	J	Key Size	K	End Flange Drilling					App. Weight (Lbs)		
												PCD		Wafer		Lug		Wafer	Lug
Inch	DN						Type					PCD	$T^{\circ}$	Nos.	Hole $\phi^*$ / Tapping UNC/UN-2B	Nos.	Tapping UNC/UN-2B		
3	80	5.00	5.00	1.89	4.61	7.48	F07/F10	0.630	1.26	0.197 x 0.197	2.52	6.00	45.00	2.00	*0.75	4	5/8-11	19	24
4	100	6.18	6.18	2.13	5.67	8.86	F07/F10	0.787	1.26	0.236 x 0.236	3.40	7.50	22.50	2.00	*0.75	8	5/8-11	33	37
5	125	7.32	7.32	2.24	5.71	8.66	F07/F10	0.866	1.26	0.236 x 0.236	4.50	8.50	22.50	2.00	*0.88	8	3/4-10	35	40
6	150	8.50	8.50	2.24	6.10	9.06	F07/F10	0.866	1.26	0.236 x 0.236	5.60	9.50	22.50	2.00	*0.88	8	3/4-10	37	44
8	200	10.63	10.63	2.52	7.32	11.22	F10/F12	0.984	1.26	0.315 x 0.276	7.32	11.75	22.50	2.00	*0.88	8	3/4-10	57	71
10	250	12.76	12.76	2.80	8.86	12.91	F12	1.181	2.00	0.315 x 0.276	9.15	14.25	15.00	2.00	*1.00	12	7/8-9	99	115
12	300	15.00	15.00	3.19	11.02	14.96	F12/F16	1.378	2.00	0.394 x 0.315	11.02	17.00	15.00	4.00	*1.00	12	7/8-9	154	176
14	350	16.26	16.26	3.62	11.26	15.94	F14	1.575	2.00	0.472 x 0.315	12.08	18.75	15.00	4.00	*1.13	12	1-8	198	243
16	400	18.50	18.50	4.02	13.19	20.67	F14/F16	1.969	2.52	0.551 x 0.354	13.85	21.25	11.25	4.00	1-8	16	1-8	361	419
18	450	21.02	21.02	4.49	13.74	20.67	F16	2.165	2.52	0.630 x 0.394	16.40	22.75	11.25	4.00	1-1/8-8	16	1-1/8-8	418	506
20	500	22.99	22.99	5.00	15.51	22.83	F25	2.362	4.02	0.709 x 0.433	17.69	25.00	9.00	4.00	1-1/8-8	20	1-1/8-8	528	595
24	600	27.24	27.24	6.06	17.71	25.39	F25	2.756	4.02	0.787 x 0.472	21.80	29.50	9.00	4.00	1-1/4-8	20	1-1/4-8	991	1079
28	700	31.50	30.00	6.50	21.14	30.31	F30	3.000	4.02	0.750 x 0.750	24.42	34.00	6.43	4.00	1-1/4-8	28	1-1/4-8	1260	1454
30	750	33.74	31.77	7.48	23.50	32.68	F30	3.000	4.02	0.750 x 0.750	27.04	36.00	6.43	4.00	1-1/4-8	28	1-1/4-8	2055	2535
32	800	35.98	34.02	7.48	23.31	34.25	F30	4.000	5.28	1.000 x 0.750	29.42	38.50	6.43	4.00	1-1/2-8	28	1-1/2-8	2315	2866
36	900	39.96	39.96	7.99	25.59	36.02	F35	4.000	5.28	1.000 x 0.750	32.27	42.75	5.63	4.00	1-1/2-8	32	1-1/2-8	2645	3306
38	950	42.24	42.24	9.88	28.35	39.21	F35	4.724	5.91	1.260 x 0.709	34.65	45.25	5.63	4.00	1-1/2-8	32	1-1/2-8	3135	4023
40	1000	44.25	44.25	9.88	30.35	40.71	F40	4.724	5.91	1.260 x 0.709	36.13	47.25	5.00	4.00	1-1/2-8	36	1-1/2-8	3483	4299
42	1050	47.00	47.00	10.00	32.40	43.70	F40	4.724	5.91	1.260 x 0.709	38.23	49.50	5.00	4.00	1-1/2-8	36	1-1/2-8	4076	5068
44	1100	49.02	49.02	10.87	34.45	49.21	F48	5.512	7.09	1.417 x 0.787	43.93	51.75	4.50	8.00	1-1/2-8	40	1-1/2-8	4409	5622
48	1200	53.50	53.50	10.87	34.45	49.21	F48	5.512	7.09	1.417 x 0.787	43.93	56.00	4.09	8.00	1-1/2-8	44	1-1/2-8	4960	6173
50	1250	55.51	55.51	12.52	36.22	51.18	-	-	-	-	-	58.25	4.09	8.00	1-3/4-8	44	1-3/4-8	-	-
52	1300	57.52	57.52	12.52	38.39	54.13	-	-	-	-	-	60.50	4.09	8.00	1-3/4-8	44	1-3/4-8	-	-
54	1350	59.49	59.49	15.35	40.35	57.09	-	-	-	-	-	62.75	4.09	8.00	1-3/4-8	44	1-3/4-8	-	-
56	1400	62.01	62.01	15.35	42.32	61.02	-	-	-	-	-	65.00	3.75	8.00	1-3/4-8	48	1-3/4-8	-	-
58	1450	64.02	64.02	17.32	44.29	63.98	-	-	-	-	-	67.25	3.75	8.00	1-3/4-8	48	1-3/4-8	-	-
60	1500	65.98	65.98	17.32	46.26	63.15	-	-	-	-	-	69.25	3.46	8.00	1-3/4-8	52	1-3/4-8	-	-
64	1600	73.63	73.63	17.32	47.24	69.88	-	-	-	-	-	76.00	3.46	16.00	1-3/4-8	52	1-3/4-8	-	-
66	1650	73.63	73.63	19.29	49.61	71.85	-	-	-	-	-	76.00	3.46	16.00	1-3/4-8	52	1-3/4-8	-	-
72	1800	80.13	80.13	19.29	51.18	76.77	-	-	-	-	-	82.50	3.00	16.00	1-3/4-8	60	1-3/4-8	-	-
76	1900	86.35	86.35	21.26	55.12	78.74	-	-	-	-	-	89.00	2.81	16.00	2-8	64	2-8	-	-
78	1950	86.35	86.35	21.26	58.07	80.71	-	-	-	-	-	89.00	2.81	16.00	2-8	64	2-8	-	-
80	2000	92.85	92.85	21.26	60.63	82.68	-	-	-	-	-	95.50	2.81	16.00	2-8	64	2-8	-	-
84	2100	92.85	92.85	24.02	64.57	88.58	-	-	-	-	-	95.50	2.81	16.00	2-8	64	2-8	-	-

Note:

- Face to face dimensions up to 24": As per API 609 Cat. B to Face to face dimensions from 26" to 84": As per manufacturer standard.
- Flange dimensions up to 24": As per ASME B16.5. to Flange dimensions 26" to 60": As per ASME B16.47 series A.
- Flange dimensions 64" to 84": As per AWWA C 207 Class E.
- Please consult DelVal for other dimensions.



# DIMENSIONS AND WEIGHTS



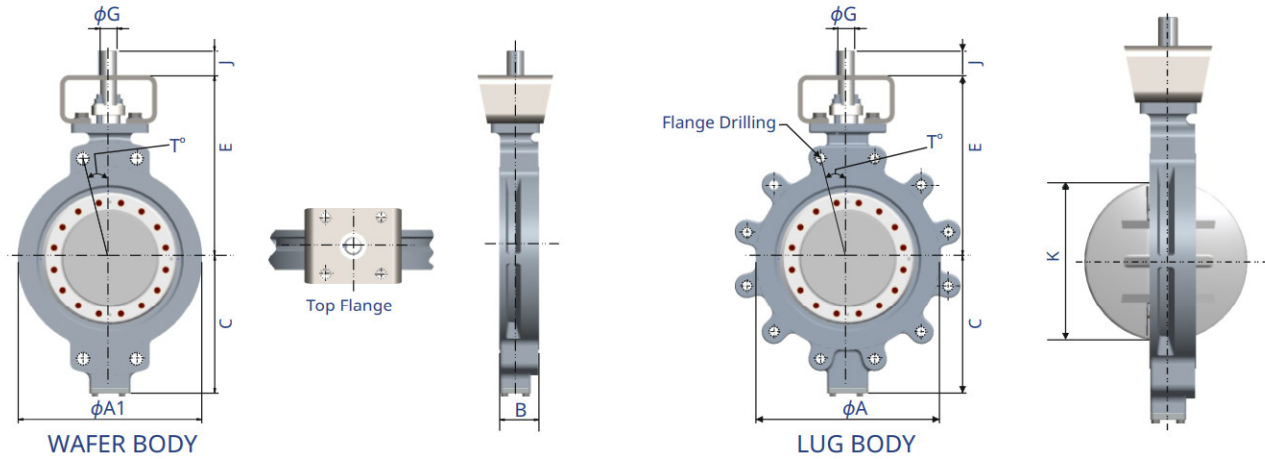
## DIMENSIONS (Inch) ASME CLASS 150 SHORT PATTERN/LONG PATTERN (SERIES 4C/4P)

Valve Size		ØA	B		C	E	Top Flange Details	ØG	J	Key Size	K (Short Pattern)	End Flange Drilling						App. Weight (Lbs)	
			SP	LP								Type	PCD	Total Nos. Holes	T°	HoleØ	No. of Tap	Tapping UNC/UN2B	DF (SP)
3	80	7.48	4.49	8.00	4.61	7.48	F07/F10	0.630	1.26	0.197 x 0.197	2.52	6.00	4	45.00	0.75	NA	5/8-11	39	42
4	100	9.06	5.00	9.00	5.67	8.86	F07/F10	0.787	1.26	0.236 x 0.236	3.40	7.50	8	22.50	0.75	4	5/8-11	61	65
5	125	10.00	5.51	10.50	5.71	8.66	F07/F10	0.866	1.26	0.236 x 0.236	4.50	8.50	8	22.50	0.88	NA	3/4-10	62	82
6	150	11.02	5.51	10.50	6.10	9.06	F07/F10	0.866	1.26	0.236 x 0.236	5.60	9.50	8	22.50	0.88	NA	3/4-10	83	92
8	200	13.58	5.98	11.49	7.32	11.22	F10/F12	0.984	1.26	0.315 x 0.276	7.28	11.75	8	22.50	0.88	NA	3/4-10	121	133
10	250	15.94	6.50	13.00	8.86	12.91	F12	1.181	2.00	0.315 x 0.276	9.15	14.25	12	15.00	1.00	4	7/8-9	198	221
12	300	19.09	7.01	14.00	11.02	14.96	F12/F16	1.378	2.00	0.394 x 0.315	10.98	17.00	12	15.00	1.00	4	7/8-9	335	367
14	350	21.06	7.48	15.00	11.26	15.94	F14	1.575	2.00	0.472 x 0.315	12.05	18.75	12	15.00	1.13	4	1-8	429	469
16	400	23.43	8.50	16.00	13.19	20.67	F14/F16	1.969	2.52	0.551 x 0.354	13.82	21.25	16	11.25	1.13	4	1-8	595	650
18	450	25.00	8.74	17.00	13.74	22.83	F16	2.165	2.52	0.630 x 0.394	16.38	22.75	16	11.25	1.25	4	1-1/8-8	650	723
20	500	27.56	9.02	18.00	15.51	20.67	F25	2.362	4.02	0.709 x 0.433	17.69	25.00	20	9.00	1.25	4	1-1/8-8	936	1029
24	600	32.09	10.51	20.00	17.72	25.39	F25	2.756	4.02	0.787 x 0.472	21.77	29.50	20	9.00	1.38	4	1-1/4-8	1322	1457
28	700	36.50	11.50	24.00	21.14	30.31	F30	3.000	4.02	0.750 x 0.750	24.42	34.00	28	6.43	1.38	4	1-1/4-8	1921	2150
30	750	38.74	12.52	24.00	23.50	32.68	F30	3.000	4.02	0.750 x 0.750	27.04	36.00	28	6.43	1.38	4	1-1/4-8	3042	3498
32	800	41.73	12.52	26.00	23.31	34.25	F30	4.000	5.28	1.000 x 0.750	29.42	38.50	28	6.43	1.63	4	1-1/2-8	3439	3955
36	900	45.98	12.99	28.00	25.59	36.02	F35	4.000	5.28	1.000 x 0.750	32.24	42.75	32	5.63	1.63	4	1-1/2-8	4133	4762
40	1000	50.75	16.14	-	30.35	40.71	F40	4.724	5.91	1.260 x 0.709	36.10	47.25	36	5.00	1.63	4	1-1/2-8	5357	-
42	1050	52.99	16.14	-	32.40	43.70	F40	4.724	5.91	1.260 x 0.709	38.19	49.50	36	5.00	1.63	4	1-1/2-8	6338	-
44	1100	55.24	18.50	-	34.45	49.21	F48	5.512	7.09	1.417 x 0.787	40.94	51.75	40	4.50	1.63	8	1-1/2-8	7010	-
48	1200	59.49	18.50	-	34.45	49.21	F48	5.512	7.09	1.417 x 0.787	43.90	56.00	44	4.09	1.63	8	1-1/2-8	7716	-
50	1250	61.75	20.87	-	36.22	51.18	-	-	-	-	-	58.25	44	4.09	1.87	8	1-3/4-8	-	-
52	1300	64.00	20.87	-	38.39	54.13	-	-	-	-	-	60.50	44	4.09	1.87	8	1-3/4-8	-	-
54	1350	66.25	20.87	-	40.35	57.09	-	-	-	-	-	62.75	44	4.09	1.87	8	1-3/4-8	-	-
56	1400	68.75	20.87	-	42.32	61.02	-	-	-	-	-	65.00	48	3.75	1.87	8	1-3/4-8	-	-
58	1450	71.00	23.62	-	44.29	63.98	-	-	-	-	-	67.25	48	3.75	1.87	8	1-3/4-8	-	-
60	1500	73.00	23.62	-	46.26	63.15	-	-	-	-	-	69.25	52	3.46	1.87	20	1-3/4-8	-	-
64	1600	80.00	23.62	-	47.24	69.88	-	-	-	-	-	76.00	52	3.46	1.87	16	1-3/4-8	-	-
66	1650	80.00	17.99	-	49.61	71.85	-	-	-	-	-	76.00	52	3.46	1.87	16	1-3/4-8	-	-
72	1800	86.50	26.38	-	51.18	76.77	-	-	-	-	-	82.50	60	3.00	1.87	16	1-3/4-8	-	-
76	1900	93.00	29.92	-	55.12	78.74	-	-	-	-	-	89.00	64	2.81	2.13	16	2-8	-	-
78	1950	93.00	29.92	-	58.07	80.71	-	-	-	-	-	89.00	64	2.81	2.13	16	2-8	-	-
80	2000	99.75	29.92	-	60.63	82.68	-	-	-	-	-	95.50	64	2.81	2.13	16	2-8	-	-
84	2100	99.75	24.02	-	64.57	88.58	-	-	-	-	-	95.50	64	2.81	2.13	16	2-8	-	-

**Note:**

- Face to face dimensions - Short pattern up to 48" & Long pattern up to 36": As per API 609 Cat. B.
- Face to face dimensions - Short pattern above 48" & Long pattern above 36": As per manufacturer standard.
- Flange dimensions up to 24": As per ASME B16.5.
- Flange dimensions 26" to 60": As per ASME B16.47 series A.
- Flange dimensions 64" to 84": As per AWWA C 207 Class E.
- Please consult DelVal for other dimensions.

# DIMENSIONS AND WEIGHTS



## DIMENSIONS (Inch)

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

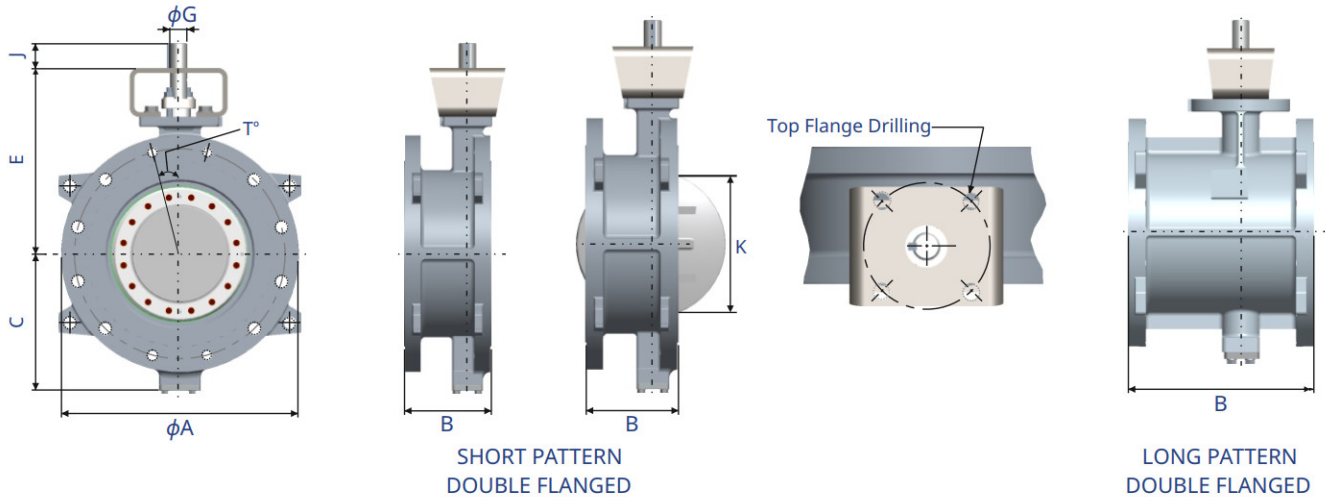
Valve Size		Top Flange Details										End Flange Drilling						App. Weight (Lbs)	
		Type	$\phi G$	J	Key Size	K	PCD		Wafer		Lug								
Inch	DN						$\phi A$	$\phi A1$	B	C	E	PCD	$T^{\circ}$	Nos.	Hole $\phi^*$ / Tapping UNC/UN-2B	Nos.	Tapping UNC/ UN-2B	Wafer	Lug
3	80	5.00	5.00	1.89	4.61	7.48	F07/F10	0.630	1.26	0.197 x 0.197	2.60	6.62	22.50	2	*0.88	8	3/4-10	22	26
4	100	6.18	6.19	2.13	5.67	8.86	F07/F10	0.787	1.26	0.236 x 0.236	3.62	7.88	22.50	2	*0.88	8	3/4-10	44	55
6	150	8.50	8.50	2.32	7.48	10.83	F12	0.984	1.26	0.315 x 0.276	5.59	10.62	15.00	2	*0.88	12	3/4-10	75	99
8	200	10.63	10.63	2.87	8.07	12.20	F12	1.378	2.01	0.394 x 0.315	7.28	13.00	15.00	4	*1.00	12	7/8-9	110	123
10	250	12.76	12.76	3.27	10.24	15.16	F16	1.378	2.01	0.394 x 0.315	8.94	15.25	11.25	4	1-8	16	1-8	176	229
12	300	15.00	15.00	3.62	11.22	16.73	F16	1.575	2.01	0.472 x 0.315	10.94	17.75	11.25	4	1-1/8-8	16	1-1/8-8	287	353
14	350	16.26	16.26	4.61	12.40	18.90	F25	2.165	2.52	0.630 x 0.394	11.73	20.25	9.00	4	1-1/8-8	20	1-1/8-8	364	518
16	400	18.50	18.50	5.24	14.88	21.65	F30	2.165	2.52	0.630 x 0.394	13.70	22.50	9.00	4	1-1/4-8	20	1-1/4-8	496	794
18	450	21.02	21.02	5.87	16.14	23.03	F30	2.756	4.02	0.787 x 0.472	15.20	24.75	7.50	4	1-1/4-8	24	1-1/4-8	754	1089
20	500	22.99	22.99	6.26	19.41	26.85	F30	3.543	5.28	0.984 x 0.551	16.22	27.00	7.50	4	1-1/4-8	24	1-1/4-8	860	1226
24	600	27.24	27.24	7.13	20.31	29.53	F35	3.543	5.28	0.984 x 0.551	19.21	32.00	7.50	4	1-1/2-8	24	1-1/2-8	1466	1764
26	650	29.49	29.49	9.02	20.67	33.07	-	-	-	-	-	34.50	6.43	4	1-1/5-8	28	1-1/5-8	1764	2205
28	700	31.50	31.50	9.02	21.65	34.84	-	-	-	-	-	37.00	6.43	4	1-1/5-8	28	1-1/5-8	2630	2943
30	750	33.74	33.74	9.06	22.83	38.58	-	-	-	-	-	39.25	6.43	4	1-3/4-8	28	1-3/4-8	3225	3655
32	800	35.98	35.98	10.67	24.02	41.34	-	-	-	-	-	41.50	6.43	4	1-7/8-8	28	1-7/8-8	3662	4092
34	850	37.99	37.99	10.67	25.00	43.31	-	-	-	-	-	43.50	6.43	4	1-7/8-8	28	1-7/8-8	3946	4299
36	900	40.24	40.24	10.67	26.18	44.29	-	-	-	-	-	46.00	5.63	4	2-8	32	2-8	4343	4762
38	950	40.51	40.51	11.81	26.18	47.24	-	-	-	-	-	43.00	5.63	4	1-1/2-8	32	1-1/2-8	4806	5071
40	1000	42.76	42.76	11.81	28.15	48.62	-	-	-	-	-	45.50	5.63	8	1-5/8-8	32	1-5/8-8	5247	5445
42	1050	44.76	44.76	13.78	30.31	51.18	-	-	-	-	-	47.50	5.63	8	1-5/8-8	32	1-5/8-8	5377	5666
44	1100	47.01	47.01	13.78	31.50	52.36	-	-	-	-	-	49.75	5.63	8	1-3/4-8	32	1-3/4-8	5842	6173
46	1150	49.02	49.02	13.78	32.48	56.69	-	-	-	-	-	52.00	6.43	8	1-7/8-8	28	1-7/8-8	6327	7121
48	1200	51.26	51.26	13.78	33.46	58.27	-	-	-	-	-	54.00	5.63	8	1-7/8-8	32	1-7/8-8	7460	8122
50	1250	53.50	53.50	15.35	36.61	60.24	-	-	-	-	-	56.25	5.63	8	2-8	32	2-8	-	-
52	1300	55.51	55.51	15.35	37.60	61.22	-	-	-	-	-	58.25	5.63	8	2-8	32	2-8	-	-
54	1350	57.76	57.76	15.35	38.78	62.40	-	-	-	-	-	61.00	6.43	8	2-1/4-8	28	2-1/4-8	-	-
56	1400	59.76	59.76	15.35	39.76	63.39	-	-	-	-	-	63.00	6.43	8	2-1/4-8	28	2-1/4-8	-	-
58	1450	62.01	62.01	17.32	40.94	64.57	-	-	-	-	-	65.00	5.63	8	2-1/4-8	32	2-1/4-8	-	-
60	1500	64.02	64.02	17.32	41.93	65.55	-	-	-	-	-	67.00	5.63	8	2-1/4-8	32	2-1/4-8	-	-

### Note:

- Face to face dimensions up to 24": As per API 609 Cat. B to Face to face dimensions from 26" to 60": As per manufacturer standard.
- Flange dimensions up to 24": As per ASME B16.5 to Flange dimensions above 26": As per ASME B16.47 series A.
- Please consult DelVal for other dimensions.



# DIMENSIONS AND WEIGHTS

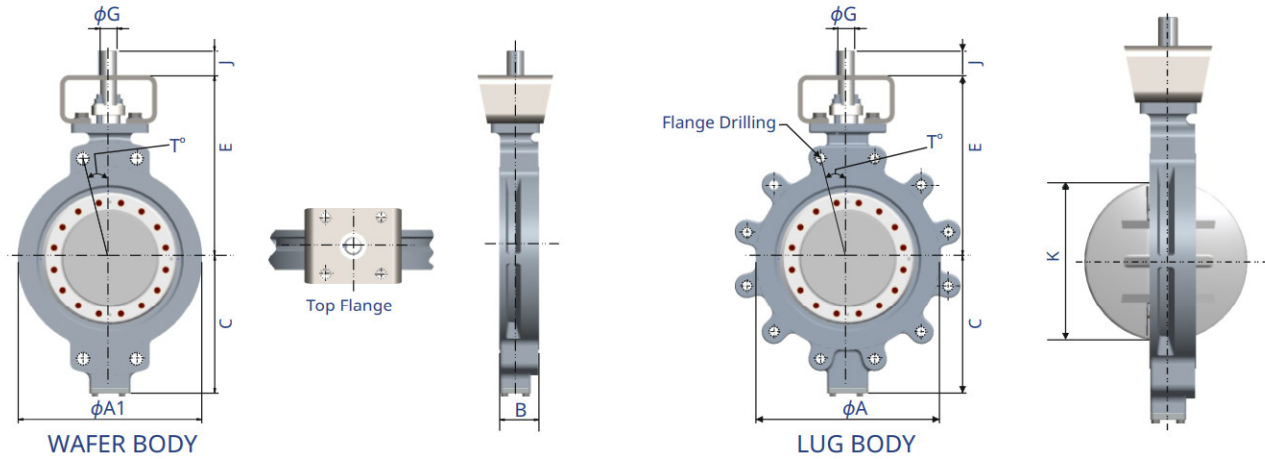


## DIMENSIONS (Inch) ASME CLASS 300 SHORT PATTERN/LONG PATTERN (SERIES 4F/4Q)

Valve Size		ØA	B		C	E	Top Flange Details	ØG	J	Key Size	K (Short Pattern)	End Flange Drilling						App. Weight (Lbs)	
			SP	LP								PCD	Total Nos. Holes	T°	HoleØ	No. of Tap	Tapping UNC/UN2B	DF (SP)	DF (LP)
Inch	DN						Type												
3	80	8.27	4.49	11.12	4.61	7.48	F07/F10	0.630	1.26	0.197 x 0.197	2.60	6.63	8	22.50	0.88	NA	3//4-10	39	44
4	100	10.04	5.00	12.00	5.67	8.86	F07/F10	0.787	1.26	0.236 x 0.236	3.62	7.88	8	22.50	0.88	NA	3//4-10	70	80
6	150	12.60	5.51	15.88	7.48	10.83	F12	0.984	1.26	0.315 x 0.276	5.59	10.62	12	15.00	0.88	NA	3//4-10	185	210
8	200	14.96	5.98	16.46	8.07	12.20	F12	1.378	2.01	0.394 x 0.315	7.28	13.00	12	15.00	1.00	NA	7//8-9	220	258
10	250	17.52	6.50	18.00	10.24	15.16	F16	1.378	2.01	0.394 x 0.315	8.94	15.25	16	11.25	1.13	4	1-8	286	340
12	300	20.47	7.01	19.75	11.22	16.73	F16	1.575	2.01	0.472 x 0.315	10.94	17.75	16	11.25	1.25	4	1-1/8-8	495	566
14	350	23.03	7.48	30.00	12.40	18.90	F25	2.165	2.52	0.630 x 0.394	11.73	20.25	20	9.00	1.25	4	1-1/8-8	683	822
16	400	25.59	8.50	33.00	14.88	21.65	F30	2.165	2.52	0.630 x 0.394	13.70	22.50	20	9.00	1.37	4	1-1/4-8	894	1200
18	450	27.95	8.75	36.00	16.14	23.03	F30	2.756	4.02	0.787 x 0.472	15.20	24.75	24	7.50	1.37	4	1-1/4-8	1157	1642
20	500	30.51	9.00	39.00	19.41	26.85	F30	3.543	5.28	0.984 x 0.551	16.22	27.00	24	7.50	1.37	4	1-1/4-8	1463	2114
24	600	35.98	10.51	45.00	20.31	29.53	F35	3.543	5.28	0.984 x 0.551	19.21	32.00	24	7.50	1.63	4	1-1/2-8	2104	3162
26	650	38.27	11.50	49.00	20.67	33.07	-	-	-	-	-	34.50	28	6.43	1.75	4	1-1/5-8	2750	4145
28	700	40.75	11.50	53.00	21.65	34.84	-	-	-	-	-	37.00	28	6.43	1.75	4	1-1/5-8	3080	4850
30	750	42.99	12.52	55.00	22.83	38.58	-	-	-	-	-	39.25	28	6.43	1.87	4	1-3/4-8	3806	5850
32	800	45.24	12.52	60.00	24.02	41.34	-	-	-	-	-	41.50	28	6.43	2.00	4	1-7/8-8	4224	6720
34	850	47.48	12.99	68.00	25.00	43.31	-	-	-	-	-	43.50	28	6.43	2.00	4	1-7/8-8	4510	7826
36	900	50.00	20.08	68.00	26.18	44.29	-	-	-	-	-	46.00	32	5.63	2.13	4	2-8	5192	8807
38	950	45.98	16.14	-	26.18	47.24	-	-	-	-	-	43.00	32	5.63	1.63	4	1-1/2-8	5412	-
40	1000	48.74	16.14	-	28.15	48.62	-	-	-	-	-	45.50	32	5.63	1.75	8	1-5/8-8	5687	-
42	1050	50.75	16.14	-	30.31	51.18	-	-	-	-	-	47.50	32	5.63	1.75	8	1-5/8-8	6268	-
44	1100	53.27	18.50	-	31.50	52.36	-	-	-	-	-	49.75	32	5.63	1.87	8	1-3/4-8	6952	-
46	1150	55.75	18.50	-	32.48	56.69	-	-	-	-	-	52.00	28	6.43	2.00	8	1-7/8-8	7546	-
48	1200	57.76	18.50	-	33.46	58.27	-	-	-	-	-	54.00	32	5.63	2.00	8	1-7/8-8	9033	-
50	1250	60.24	20.87	-	36.61	-	-	-	-	-	-	56.25	32	5.63	2.13	8	2-8	-	-
52	1300	62.24	20.87	-	37.60	-	-	-	-	-	-	58.25	32	5.63	2.13	8	2-8	-	-
54	1350	65.24	20.87	-	38.78	-	-	-	-	-	-	61.00	28	6.43	2.37	8	2-1/4-8	-	-
56	1400	67.24	20.87	-	39.76	-	-	-	-	-	-	63.00	28	6.43	2.37	8	2-1/4-8	-	-
58	1450	69.25	23.62	-	40.94	-	-	-	-	-	-	65.00	32	5.63	2.37	8	2-1/4-8	-	-
60	1500	71.26	23.62	-	41.93	-	-	-	-	-	-	67.00	32	5.63	2.37	8	2-1/4-8	-	-

- Note:
- Face to face dimensions - Short pattern up to 48" & Long pattern up to 36": As per API 609.
  - Face to face dimensions - Short pattern above 48" & Long pattern above 36": As per manufacturer standard.
  - Flange dimensions up to 24": As per ASME B16.5.
  - Flange dimensions above 26": As per ASME B16.47 series A.
  - Please consult DelVal for other dimensions.

# DIMENSIONS AND WEIGHTS



## DIMENSIONS (Inch)

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

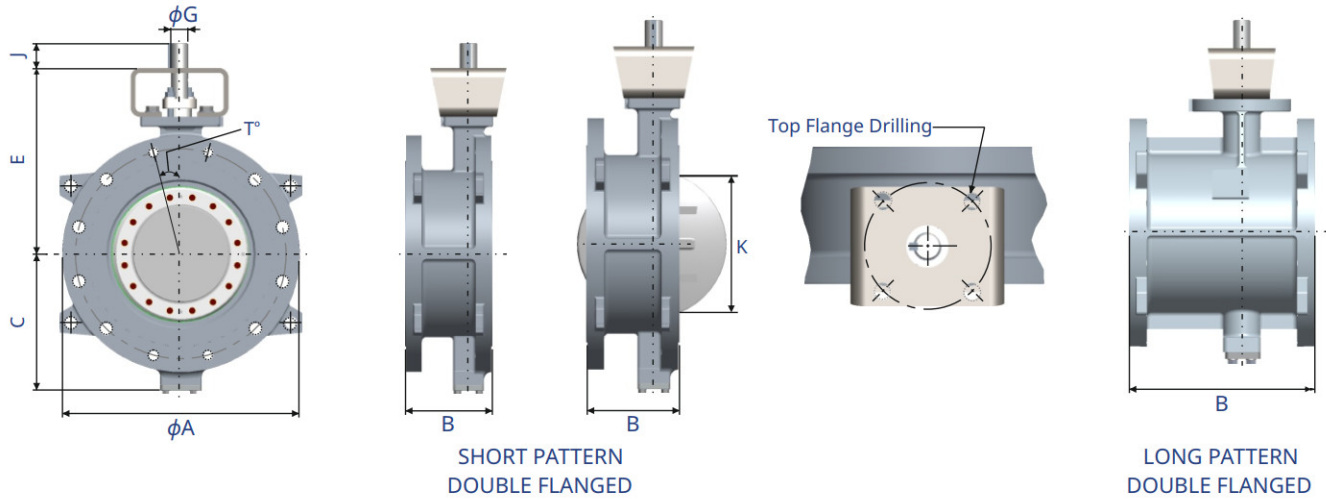
Valve Size								Top Flange Details		Key Size		PCD		End Flange Drilling				App. Weight (Lbs)	
														Wafer		Lug			
Inch	DN	$\phi A$	$\phi A1$	B	C	E	Type	$\phi G$	J	PCD	$T^{\circ}$	Nos.	Hole $\phi^*$ Tapping UNC/UN-2B	Nos.	Tapping UNC/ UN-2B	Wafer	Lug		
3	80	5.75	5.75	2.52	5.79	8.86	F12	0.984	1.77	0.315 x 0.276	2.76	6.62	22.50	4	*0.88	8	3/4-10	30	33
4	100	6.89	6.89	3.07	6.69	10.82	F14	1.181	2.00	0.315 x 0.276	3.15	8.50	22.50	4	*1.00	8	7/8-9	57	66
6	150	9.49	9.49	3.07	7.64	12.00	F16	1.378	2.00	0.394 x 0.315	5.70	11.50	15.00	4	1-8	12	1-8	136	154
8	200	11.89	11.89	4.02	9.84	18.54	F16	1.772	3.03	0.551 x 0.354	6.37	13.75	15.00	4	1-1/8-8	12	1-1/8-8	198	220
10	250	14.02	14.02	4.61	11.81	20.47	F25	2.165	3.15	0.630 x 0.394	7.67	17.00	11.25	4	1-1/4-8	16	1-1/4-8	291	407
12	300	16.26	16.26	5.51	13.70	23.03	F25	2.559	3.54	0.709 x 0.433	8.97	19.25	9.00	4	1-1/4-8	20	1-1/4-8	485	559
14	350	17.99	17.99	6.10	14.96	25.00	F25	2.953	4.02	0.787 x 0.472	10.74	20.75	9.00	4	1-3/8-8	20	1-3/8-8	622	713
16	400	20.00	20.00	7.01	17.40	26.18	F30	3.500	4.72	0.875 x 0.625	11.10	23.75	9.00	4	1-1/2-8	20	1-1/2-8	992	1131
18	450	22.64	22.64	7.87	18.39	27.95	F35	3.500	4.72	0.875 x 0.625	13.19	25.75	9.00	4	1-5/8-8	20	1-5/8-8	1212	1386
20	500	25.00	25.00	8.50	19.88	31.30	F35	4.000	5.94	1.000 x 0.750	14.76	28.50	7.50	4	1-5/8-8	24	1-5/8-8	1521	1760
24	600	29.49	29.49	9.13	23.03	36.42	F40	4.921	6.30	1.260 x 0.709	17.13	33.00	7.50	4	1-7/8-8	24	1-7/8-8	2394	2728
26	650	29.49	29.49	11.50	24.61	40.35	-	-	-	-	-	36.00	6.43	8	1-7/8-8	28	1-7/8-8	-	-
28	700	31.50	31.50	11.50	25.59	41.34	-	-	-	-	-	38.00	6.43	8	2-8	28	2-8	-	-
30	750	33.74	33.74	12.52	26.77	42.52	-	-	-	-	-	40.25	6.43	8	2-8	28	2-8	-	-
32	800	35.98	35.98	12.52	27.95	43.70	-	-	-	-	-	42.50	6.43	8	2-1/4-8	28	2-1/4-8	-	-
34	850	37.99	37.99	12.99	28.94	44.69	-	-	-	-	-	44.50	6.43	8	2-1/4-8	28	2-1/4-8	-	-
36	900	40.24	40.24	12.99	29.92	45.67	-	-	-	-	-	47.00	6.43	8	2-1/2-8	28	2-1/2-8	-	-
38	950	41.50	41.50	16.14	32.68	50.39	-	-	-	-	-	45.75	6.43	8	2-1/4-8	28	2-1/4-8	-	-
40	1000	43.74	43.74	16.14	33.66	51.38	-	-	-	-	-	47.75	5.63	8	2-1/4-8	32	2-1/4-8	-	-
42	1050	45.98	45.98	18.50	34.84	52.56	-	-	-	-	-	50.50	6.43	8	2-1/2-8	28	2-1/2-8	-	-
44	1100	48.27	48.27	18.50	36.02	53.74	-	-	-	-	-	52.50	5.63	8	2-1/2-8	32	2-1/2-8	-	-
46	1150	50.24	50.24	18.50	37.01	54.72	-	-	-	-	-	54.75	5.63	8	2-1/2-8	32	2-1/2-8	-	-
48	1200	52.52	52.52	18.50	38.19	55.91	-	-	-	-	-	57.50	5.63	8	2-3/4-8	32	2-3/4-8	-	-

Note:

- Face to face dimensions up to 24": As per API 609 Cat. B except 3" & 4".
- Face to face dimensions above 24": As per manufacturer standard.
- Flange dimensions up to 24": As per ASME B16.5.
- Flange dimensions above 24": As per ASME B16.47 series A.
- Please consult DelVal for other dimensions.



# DIMENSIONS AND WEIGHTS

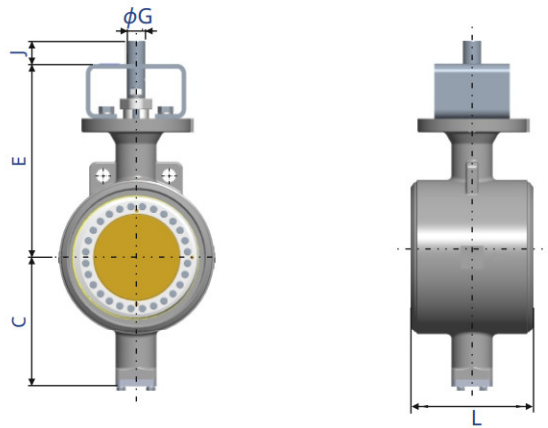


## DIMENSIONS (Inch) ASME CLASS 600 SHORT PATTERN/LONG PATTERN (SERIES 4J/4R)

Valve Size		$\phi A$	B		C	E	Top Flange Details	$\phi G$	J	Key Size	K (Short Pattern)	End Flange Drilling						App. Weight (Lbs)	
			SP	LP								PCD	Total Nos. Holes	$T^\circ$	Hole $\phi$	Short Pattern		DF (SP)	DF (LP)
Inch	DN					Type										No. of Tap	Tapping UNC/UN2B		
3	80	8.27	7.09	14.00	5.79	8.86	F12	0.984	1.77	0.315 x 0.276	2.76	6.62	8	22.50	0.88	4	3/4-10	90	100
4	100	10.75	7.48	17.00	6.69	10.82	F14	1.181	2.00	0.315 x 0.276	3.15	8.50	8	22.50	1.00	4	7/8-9	143	155
6	150	14.02	8.27	22.00	7.64	12.00	F16	1.378	2.00	0.394 x 0.315	5.70	11.50	12	15.00	1.13	4	1-8	290	324
8	200	16.50	9.06	26.00	9.84	18.54	F16	1.772	3.03	0.551 x 0.354	6.37	13.75	12	15.00	1.25	4	1-1/8-8	352	415
10	250	20.00	9.84	31.00	11.81	20.47	F25	2.165	3.15	0.630 x 0.394	7.67	17.00	16	11.25	1.37	4	1-1/4-8	586	700
12	300	22.01	10.63	33.00	13.70	23.03	F25	2.559	3.54	0.709 x 0.433	8.97	19.25	16	11.25	1.37	4	1-1/4-8	804	930
14	350	23.74	11.42	35.00	14.96	25.00	F30	2.953	4.02	0.787 x 0.472	10.74	20.75	20	9.00	1.50	4	1-3/8-8	1079	1222
16	400	27.01	12.20	39.00	17.40	26.18	F30	3.500	5.51	0.875 x 0.625	11.10	23.75	20	9.00	1.63	4	1-1/2-8	1540	1900
18	450	29.25	12.99	43.00	18.39	27.95	F35	3.500	4.72	0.875 x 0.625	13.19	25.75	24	7.50	1.75	4	1-5/8-8	1619	2139
20	500	32.01	13.78	47.00	19.88	31.30	F35	4.000	5.94	1.000 x 0.750	14.76	28.50	24	7.50	1.75	4	1-5/8-8	1917	2650
24	600	37.01	15.35	55.00	23.03	36.42	F40	4.921	6.30	1.260 x 0.709	17.13	33.00	24	7.50	2.00	4	1-7/8-8	3129	4350
26	650	40.00	16.93	57.00	24.61	40.35	-	-	-	-	-	36.00	28	6.43	2.00	8	1-7/8-8	3736	5972
28	700	42.24	16.93	61.00	25.59	41.34	-	-	-	-	-	38.00	28	6.43	2.13	8	2-8	4166	6913
30	750	44.49	18.50	65.00	26.77	42.52	-	-	-	-	-	40.25	28	6.43	2.13	8	2-8	4519	7980
32	800	47.01	18.50	70.00	27.95	43.70	-	-	-	-	-	42.50	28	6.43	2.37	8	2-1/4-8	5632	9788
34	850	49.02	20.08	82.00	28.94	44.69	-	-	-	-	-	44.50	28	6.43	2.37	8	2-1/4-8	5963	11622
36	900	51.73	20.08	82.00	29.92	45.67	-	-	-	-	-	47.00	28	6.43	2.63	8	2-1/2-8	6404	11774
38	950	50.00	21.65	-	32.68	50.39	-	-	-	-	-	45.75	28	6.43	2.37	8	2-1/4-8	-	-
40	1000	52.01	21.65	-	33.66	51.38	-	-	-	-	-	47.75	32	5.63	2.37	8	2-1/4-8	-	-
42	1050	55.24	24.80	-	34.84	52.56	-	-	-	-	-	50.50	28	6.43	2.63	8	2-1/2-8	-	-
44	1100	57.24	24.80	-	36.02	53.74	-	-	-	-	-	52.50	32	5.63	2.63	8	2-1/2-8	-	-
46	1150	59.49	24.80	-	37.01	54.72	-	-	-	-	-	54.75	32	5.63	2.63	8	2-1/2-8	-	-
48	1200	62.76	24.80	-	38.19	55.91	-	-	-	-	-	57.50	32	5.63	2.87	8	2-3/4-8	-	-

- Note:
- Face to face dimensions - Short pattern up to 48" & Long pattern up to 36": As per API 609.
  - Face to face dimensions - Short pattern above 48" & Long pattern above 36": As per manufacturer standard.
  - Flange dimensions up to 24": As per ASME B16.5.
  - Flange dimensions above 26": As per ASME B16.47 series A.
  - Please consult DelVal for other dimensions.

# DIMENSIONS AND WEIGHTS



BUTT WELD

## DIMENSIONS (Inch)

### ASME CLASS 150 BUTT WELD (SERIES 4W)

Valve Size		L	C	E	Top Flange Details	$\phi G$	J	Key Size	Appx. Weight
Inch	DN				Type				Lbs
3	80	7.09	4.61	7.48	F07/F10	0.630	1.26	0.197 x 0.197	24
4	100	7.48	5.67	8.86	F07/F10	0.787	1.26	0.236 x 0.236	33
5	125	7.87	5.71	8.66	F07/F10	0.866	1.26	0.236 x 0.236	51
6	150	8.27	6.10	9.06	F07/F10	0.866	1.26	0.236 x 0.236	59
8	200	9.06	7.32	11.22	F10/F12	0.984	1.26	0.315 x 0.276	121
10	250	9.84	8.86	12.91	F12	1.181	2.00	0.315 x 0.276	180
12	300	10.63	11.02	14.96	F12/F16	1.378	2.00	0.394 x 0.315	225
14	350	11.42	11.26	15.94	F14	1.575	2.00	0.472 x 0.315	325
16	400	12.20	13.19	20.67	F14/F16	1.969	2.52	0.551 x 0.354	532
18	450	12.99	13.74	20.67	F16	2.165	2.52	0.630 x 0.394	604
20	500	13.78	15.51	22.83	F25	2.362	4.02	0.709 x 0.433	695
24	600	15.35	17.72	25.39	F25	2.756	4.02	0.787 x 0.472	1050

### ASME CLASS 300 BUTT WELD (SERIES 4Y)

3	80	7.09	4.61	7.48	F07/F10	0.630	1.26	0.197 x 0.197	24
4	100	7.48	5.67	8.86	F07/F10	0.787	1.26	0.236 x 0.236	33
6	150	8.27	7.48	10.83	F12	0.984	1.26	0.315 x 0.276	80
8	200	9.06	8.07	12.20	F12	1.378	2.01	0.394 x 0.315	150
10	250	9.84	10.24	15.16	F16	1.378	2.01	0.394 x 0.315	217
12	300	10.63	11.22	16.73	F16	1.575	2.01	0.472 x 0.315	300
14	350	11.42	12.40	18.90	F25	2.165	2.52	0.630 x 0.394	422
16	400	12.20	14.88	21.65	F30	2.165	2.52	0.630 x 0.394	763
18	450	12.99	16.14	23.03	F30	2.756	4.02	0.787 x 0.472	993
20	500	13.78	16.54	25.59	F30	3.500	5.28	0.875 x 0.625	1220
24	600	15.35	20.31	29.53	F35	3.543	5.28	0.984 x 0.551	1900

### ASME CLASS 600 BUTT WELD (SERIES 4K)

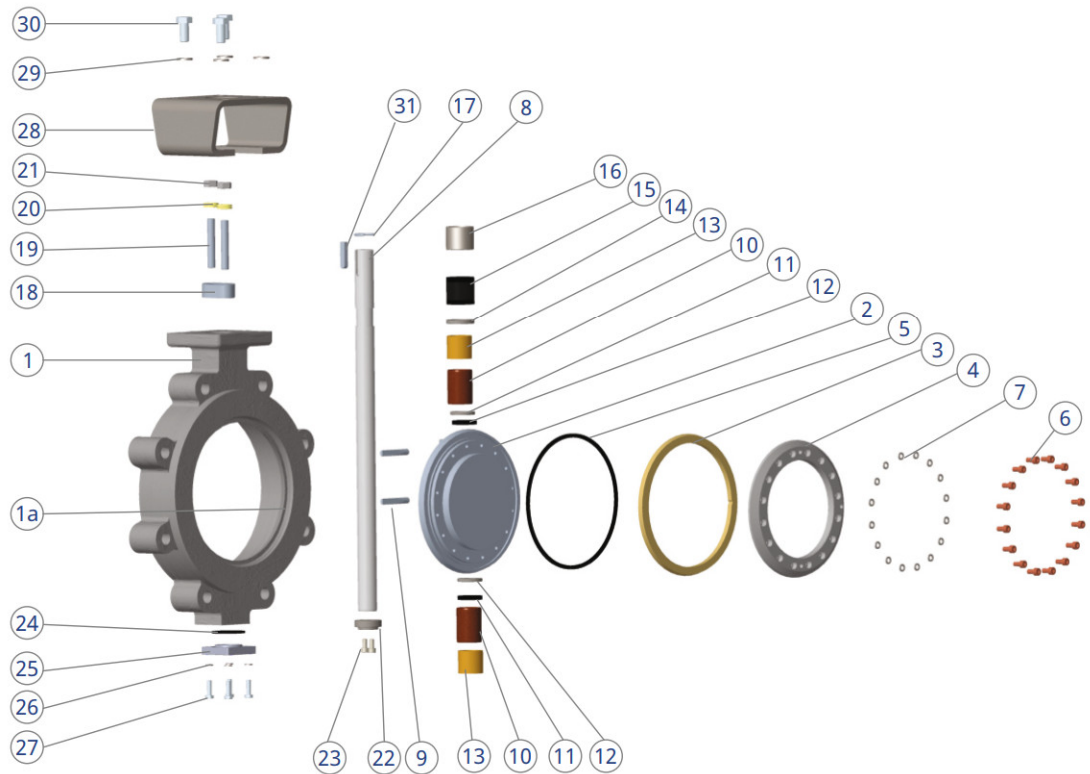
3	80	7.09	5.79	8.86	F12	0.984	1.77	0.315 x 0.276	65
4	100	7.48	6.69	10.82	F14	1.181	2.00	0.315 x 0.276	130
6	150	8.27	7.64	12.00	F16	1.378	2.00	0.394 x 0.315	180
8	200	9.06	9.84	18.54	F16	1.772	3.03	0.551 x 0.354	270
10	250	9.84	11.81	20.47	F25	2.165	3.15	0.630 x 0.394	480
12	300	10.63	13.70	23.03	F25	2.559	3.54	0.709 x 0.433	650
14	350	11.42	14.96	25.00	F30	2.953	4.02	0.787 x 0.472	1210
16	400	12.20	17.40	26.18	F30	3.500	5.51	0.875 x 0.625	1424
18	450	12.99	18.39	27.95	F35	3.500	4.72	0.875 x 0.625	1800
20	500	13.78	19.88	31.30	F35	4.000	5.94	1.000 x 0.750	2600
24	600	15.35	23.03	36.42	F40	4.921	6.30	1.260 x 0.709	3900

Note:

End to end dimensions " L " conforms to ISO5752 series 14.



# STANDARD MATERIALS OF CONSTRUCTION



## Part List

Item	Description	Standard Material*	
		Carbon steel	Stainless steel
1	Body	ASTM A216 WCB/WCC, ASTM A352 LCC/LCB	ASTM A351 CF8M/CF3M
1a	Body Seat	Stellite®Gr. 21	Stellite®Gr. 21
2	Disc	ASTM A216 WCB/WCC, ASTM A352 LCC/LCB	ASTM A351 CF8M/CF3M
3**	Seal Ring	ASTM A 240 S31803 (Duplex)+Graphite ASTM A 240 S20910 (XM-19) +Graphite ASTM A 240 S20910 (XM-19) +hard faced	ASTM A 240 S31803 (Duplex)+Graphite ASTM A 240 S20910 (XM-19)+Graphite 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	SS316+Graphite	SS316+Graphite
6	Retainer Screw	ASTM A1082 Type 630 H1150M ( 17 - 4PH )	ASTM A1082 Type 630 H1150M ( 17 - 4PH )
7	Spring Washer	ASTM A580 SS304	ASTM A580 SS316
8	Stem	ASTM A322 4130 ASTM A479 SS410 -cond.3 ASTM A564 Type 630 (17-4PH)	ASTM A564 Type 630 (17-4PH) ASTM A479 XM19
9	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
10	Stem Bearing	ASTM A 479 SS316/SS316L+Nitriding	ASTM A 479 SS316/SS316L+Nitriding
11	Bearing Protector	Graphite	Graphite
12	Bearing Protector Support	ASTM A 479 SS316/SS316L	ASTM A 479 SS316/SS316L
13	Bearing Spacer	ASTM A 479 SS316/SS316L	ASTM A 479 SS316/SS316L
14	Packing Spacer	ASTM A 479 SS316/SS316L	ASTM A 479 SS316/SS316L

Item	Description	Standard Material*	
		Carbon steel	Stainless steel
15	Gland Packing	Graphite	Graphite
16	Gland	ASTM A 479 SS316/SS316L	ASTM A 479 SS316/SS316L
17	Stem Retainer	ASTM A313 SS302	ASTM A313 SS302
18	Gland Flange	ASTM A516 Gr.70 / WCB / ASTM A105	ASTM A240 SS316/CF8M
19	Stud	ASTM A193 Gr B7M	ASTM A1082 TYPE 630 H1150M (17-4PH )
20	Belleville Spring	ASTM A666 SS304	ASTM A666 SS304
21	Hex Nut	ASTM A194 Gr 2HM	ASTM A1082 TYPE 630 H1150M (17-4PH )
22	Thrust Bearing	ASTM A 479 SS316/SS316L+Nitriding	ASTM A 479 SS316/SS316L+Nitriding
23	Bearing Screw	ASTM A193 Gr. B8M	ASTM A193 Gr. B8M
24	Cover Gasket	Graphite, SS316/SS316L+Graphite	Graphite, SS316/SS316L+Graphite
25	Bottom Cover	ASTM A516 Gr.70, ASTM A240 SS304	ASTM A240 SS316/SS316L
26	Spring Washer	ASTM A580 SS304	ASTM A580 SS316
27	Hex Hd Screw	ISO 3506 A4 -70	ISO 3506 A4 -70
28	Bracket	Carbon steel	Stainless steel
29	Spring Washer	ASTM A580 SS304	ASTM A580 SS316
30	Hex Hd Screw	ISO 3506 A4 -70	ISO 3506 A4 -70
31	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 are available on request.

\*\*Recommended spares .

# TORQUE DATA

## ASME CLASS 150

Valve Size		Flow Direction*	Torque at various differential pressure (Lbf-Inch) for CL 150									
			50 psi		100 psi		150 psi		230 psi		290 psi	
INCH	DN		ETC	BTO	ETC	BTO	ETC	BTO	ETC	BTO	ETC	BTO
3	80	Shaft Side (Pref.)	201	251	334	418	751	939	793	992	835	1045
		Disc Side (N. Pref.)	276	220	459	367	1033	827	1091	873	1148	918
4	100	Shaft Side (Pref.)	260	325	433	542	958	1197	1016	1270	1083	1355
		Disc Side (N. Pref.)	357	286	596	476	1317	1054	1397	1118	1489	1191
6	150	Shaft Side (Pref.)	449	561	748	935	1646	2058	1780	2225	1869	2337
		Disc Side (N. Pref.)	617	493	1028	822	2264	1811	2447	1958	2570	2056
8	200	Shaft Side (Pref.)	680	850	1133	1416	2336	2920	2690	3363	2832	3540
		Disc Side (N. Pref.)	935	748	1558	1246	3212	2570	3699	2959	3894	3115
10	250	Shaft Side (Pref.)	1560	1950	2600	3250	4930	6174	6066	7582	6499	8125
		Disc Side (N. Pref.)	2145	1716	3574	2860	6791	5433	8340	6672	8936	7149
12	300	Shaft Side (Pref.)	2008	2511	3347	4185	5857	7322	7280	9100	8368	10462
		Disc Side (N. Pref.)	2761	2209	4602	3682	8054	6443	10010	8008	11506	9205
14	350	Shaft Side (Pref.)	2664	3331	4441	5551	8511	10638	10472	13090	11101	13878
		Disc Side (N. Pref.)	3663	2931	6106	4884	11702	9362	14399	11519	15264	12211
16	400	Shaft Side (Pref.)	4496	5621	7493	9368	13269	16587	17172	21465	18733	23419
		Disc Side (N. Pref.)	6182	4946	10303	8243	18245	14596	23612	18889	25758	20607
18	450	Shaft Side (Pref.)	6139	7675	10232	12791	16551	20689	21442	26802	25580	31978
		Disc Side (N. Pref.)	8441	6753	14069	11255	22758	18206	29482	23586	35172	28138
20	500	Shaft Side (Pref.)	7723	9654	12871	16091	21701	27127	30681	38352	32178	40227
		Disc Side (N. Pref.)	10619	8495	17698	14159	29840	23872	42187	33750	44245	35396
24	600	Shaft Side (Pref.)	11894	14869	19824	24782	35194	43993	45250	56563	49560	61955
		Disc Side (N. Pref.)	16355	13084	27258	21806	48392	38714	62219	49775	68145	54516
26	650	Shaft Side (Pref.)	20390	25488	33984	42480	62708	78385	77526	96907	84960	106200
		Disc Side (N. Pref.)	28037	22429	46728	37382	86224	68979	106598	85278	116820	93456
28	700	Shaft Side (Pref.)	23789	29739	39648	49564	74753	93441	99120	123900	99120	123911
		Disc Side (N. Pref.)	32710	26168	54516	43613	102785	82228	136290	109032	136290	109032
30	750	Shaft Side (Pref.)	31863	33456	53105	55760	79657	83640	116166	121981	132761	139399
		Disc Side (N. Pref.)	35049	29739	58415	49564	87622	74346	127787	108422	146037	123911
32	800	Shaft Side (Pref.)	36788	45989	61313	76648	104546	130682	135202	169003	153282	191619
		Disc Side (N. Pref.)	50583	40466	84305	67444	143751	115000	185903	148722	210762	168610
34	850	Shaft Side (Pref.)	49691	62113	82818	103522	132360	165451	194104	242630	207044	258805
		Disc Side (N. Pref.)	68325	54660	113874	91100	181996	145597	266893	213514	284686	227749
36	900	Shaft Side (Pref.)	55649	69567	92748	115945	148231	185288	217378	271722	231870	289862
		Disc Side (N. Pref.)	76517	61214	127529	102023	203817	163054	298894	239115	318821	255057
38	950	Shaft Side (Pref.)	65601	82001	109335	136668	179827	224783	241687	302109	273337	341671
		Disc Side (N. Pref.)	90201	72161	150335	120268	247262	197809	332320	265856	375838	300670
40	1000	Shaft Side (Pref.)	72811	91021	121351	151702	199590	249488	268250	335312	303378	379255
		Disc Side (N. Pref.)	100115	80092	166858	133486	274437	219549	368843	295075	417144	333715
42	1050	Shaft Side (Pref.)	74527	93167	124211	155278	222943	278679	275892	344866	310528	388194
		Disc Side (N. Pref.)	102475	81979	170791	136632	306547	245238	379352	303482	426977	341581
44	1100	Shaft Side (Pref.)	80712	100890	134520	168150	237870	297338	310052	387565	336300	420375
		Disc Side (N. Pref.)	110979	88783	184965	147972	327072	261657	426321	341057	462412	369930
48	1200	Shaft Side (Pref.)	115444	144317	192406	240528	336710	420888	437723	547154	481015	601320
		Disc Side (N. Pref.)	158735	126988	264558	211646	462977	370381	601870	481496	661395	529116

Notes:-

- \*Flow from stem side is the preferred flow direction. Flow from retainer side is non-preferred flow direction. Arrow on valve body indicates the preferred flow direction.
- 1. BTO - Break to Open; RTO - Run to Open; ETO - End to Open; BTC - Break to Close; RTC - Run to Close; ETC - End to Close. (Pref. ) = Preferred , (N. Pref.) = Non Preferred.
- 2. RTO, ETO, BTC, RTC= 0.4 x Max (BTO, ETC)
- 3. For actuator sizing, the minimum valve differential pressure shall be 3.5 bar. For differential pressures above 3.5 bar the intermediated values to be interpolated. For gear operator sizing, the full rated torque to be considered.
- 4. The published torque values are common for both laminar seal & metal seal without any factor of safety. For operator sizing, factor of 30% to be considered.
- 5. For valves with extension (cryogenic service / high temperature service), 1.5 times of preferred side BTO torque to be considered as a base torque without factor of safety and valves shall be offered as uni-directional. For operator sizing, factor of 30% to be considered.
- 6. The published torque values are without factor of safety.
- 7. The following factor of safety shall be considered for operator sizing:  
clean service (liquid, steam, clean gas and non-abrasive) = 1.3, high solids slurry = 1.5, Dry gas= 1.7



# TORQUE DATA

## ASME CLASS 300

Valve Size		Flow Direction*	Torque at various differential pressure (Lbf-Inch) for CL 300													
			50 psi		100 psi		150 psi		290 psi		435 psi		580 psi		750 psi	
INCH	DN		ETC	BTO	ETC	BTO	ETC	BTO	ETC	BTO	ETC	BTO	ETC	BTO	ETC	BTO
3	80	Shaft Side (Pref.)	386	485	724	909	965	1213	1354	1693	1467	1834	1579	1974	1805	2256
		Disc Side (N. Pref.)	531	425	996	797	1328	1062	1862	1489	2017	1613	2172	1737	2482	1985
4	100	Shaft Side (Pref.)	614	768	1152	1440	1536	1920	1728	2160	1872	2341	2112	2641	2208	2761
		Disc Side (N. Pref.)	845	676	1584	1268	2112	1690	2377	1901	2575	2060	2905	2324	3037	2429
6	150	Shaft Side (Pref.)	1022	1278	1917	2396	2556	3194	2914	3643	3194	3993	3513	4392	3993	4992
		Disc Side (N. Pref.)	1405	1124	2635	2108	3513	2811	4008	3206	4392	3513	4831	3865	5490	4392
8	200	Shaft Side (Pref.)	2070	2588	3881	4852	5175	6469	6093	7617	7095	8869	7930	9912	8765	10957
		Disc Side (N. Pref.)	2847	2277	5337	4270	7116	5693	8378	6703	9756	7805	10904	8723	12051	9641
10	250	Shaft Side (Pref.)	2779	3473	5210	6512	6947	8683	9132	11415	10693	13367	11708	14635	12489	15612
		Disc Side (N. Pref.)	3821	3056	7164	5731	9552	7641	12557	10045	14703	11763	16099	12879	17172	13738
12	300	Shaft Side (Pref.)	3745	4680	7021	8776	9361	11701	12356	15446	16101	20126	18722	23403	20220	25278
		Disc Side (N. Pref.)	5148	4119	9653	7723	12871	10297	16990	13592	22139	17711	25743	20594	27803	22242
14	350	Shaft Side (Pref.)	5114	6392	9589	11986	12785	15981	16691	20864	19888	24860	24150	30187	26280	32854
		Disc Side (N. Pref.)	7032	5625	13184	10547	17579	14063	22951	18361	27346	21877	33206	26565	36136	28909
16	400	Shaft Side (Pref.)	8614	10768	16151	20189	21535	26919	28458	35572	35764	44705	43071	53839	48455	60575
		Disc Side (N. Pref.)	11844	9476	22208	17767	29611	23689	39129	31303	49176	39341	59223	47378	66626	53301
18	450	Shaft Side (Pref.)	11483	14354	21530	26913	28707	35884	38755	48444	46650	58312	55980	69975	66028	82542
		Disc Side (N. Pref.)	15789	12631	29605	23684	39473	31578	53288	42631	64144	51315	76972	61578	90788	72630
20	500	Shaft Side (Pref.)	13009	16261	24392	30490	32522	40653	43609	54512	57653	72067	69480	86850	81306	101642
		Disc Side (N. Pref.)	17887	14310	33539	26831	44718	35774	59963	47970	79274	63419	95535	76428	111796	89437
24	600	Shaft Side (Pref.)	19348	24185	36277	45347	48369	60462	61764	77205	81856	102320	107157	133946	126505	158145
		Disc Side (N. Pref.)	26603	21282	49881	39905	66508	53206	84926	67940	112552	90042	147341	117873	173944	139155

Notes:-

\*Flow from stem side is the preferred flow direction. Flow from retainer side is non-preferred flow direction. Arrow on valve body indicates the preferred flow direction.

1. BTO - Break to Open; RTO - Run to Open; ETO - End to Open; BTC - Break to Close; RTC - Run to Close; ETC - End to Close. (Pref. ) = Preferred , (N. Pref.) = Non Preferred.

2. RTO, ETO, BTC, RTC= 0.4 x Max (BTO, ETC)

3. For actuator sizing, the minimum valve differential pressure shall be 3.5 bar. For differential pressures above 3.5 bar the intermediated values to be interpolated. For gear operator sizing, the full rated torque to be considered.

4. The published torque values are common for both laminar seal & metal seal without any factor of safety. For operator sizing, factor of 30% to be considered.

5. For valves with extension (cryogenic service / high temperature service), 1.5 times of preferred side BTO torque to be considered as a base torque without factor of safety and valves shall be offered as uni-directional. For operator sizing, factor of 30% to be considered.

6. The published torque values are without factor of safety.

7. The following factor of safety shall be considered for operator sizing:

clean service (liquid, steam, clean gas and non-abrasive) = 1.3, high solids slurry = 1.5, Dry gas= 1.7

# TORQUE DATA

## ASME CLASS 600

Valve Size		Flow Direction*	Torque at various differential pressure (Lbf-Inch) for CL 600											
			150 psi		435 psi		580 psi		870 psi		1160 psi		1500 psi	
INCH	DN		ETC	BTO	ETC	BTO	ETC	BTO	ETC	BTO	ETC	BTO	ETC	BTO
3	80	Shaft Side (Pref.)	1162	1452	1549	1936	1807	2258	2194	2743	2581	3227	3356	4195
		Disc Side (N. Pref.)	1598	1278	2130	1704	2484	1987	3017	2414	3550	2840	4614	3692
4	100	Shaft Side (Pref.)	1970	2463	2627	3284	3065	3831	3722	4652	4379	5473	5692	7115
		Disc Side (N. Pref.)	2709	2168	3612	2890	4215	3371	5118	4094	6021	4817	7827	6262
6	150	Shaft Side (Pref.)	4118	5147	5490	6862	6405	8006	7777	9721	9150	11437	11894	14869
		Disc Side (N. Pref.)	5661	4529	7548	6039	8807	7045	10694	8555	12581	10064	16355	13084
8	200	Shaft Side (Pref.)	7601	9501	10135	12668	11654	14568	14188	17735	16722	20902	21282	26605
		Disc Side (N. Pref.)	10451	8361	13935	11148	16025	12820	19509	15607	22993	18394	29263	23411
10	250	Shaft Side (Pref.)	11850	14813	15800	19750	18194	22742	22025	27531	26812	33516	36388	45490
		Disc Side (N. Pref.)	16294	13035	21725	17380	25017	20013	30284	24227	36867	29494	50034	40027
12	300	Shaft Side (Pref.)	17540	21925	23387	29233	27772	34715	33618	42023	39952	49940	47748	59689
		Disc Side (N. Pref.)	24117	19294	32156	25725	38186	30549	46225	36980	54934	43947	65653	52522
14	350	Shaft Side (Pref.)	23196	28995	30928	38660	39114	48893	48666	60832	57307	71634	68223	85286
		Disc Side (N. Pref.)	31895	25515	42526	34020	53782	43026	66915	53532	78797	63038	93806	75045
16	400	Shaft Side (Pref.)	34104	42630	45472	56840	62751	78439	80940	101175	88216	110270	104586	130744
		Disc Side (N. Pref.)	46893	37514	62524	50019	86283	69027	111293	89034	121297	97037	143805	115044
18	450	Shaft Side (Pref.)	47215	59018	62953	78691	84537	105671	107919	134899	130402	163003	152886	191123
		Disc Side (N. Pref.)	64920	51936	86560	69248	116238	92990	148389	118711	179303	143443	210218	168174
20	500	Shaft Side (Pref.)	57364	71705	76485	95606	105496	131870	131870	164838	158244	197805	184618	230792
		Disc Side (N. Pref.)	78875	63100	105166	84133	145057	116046	181321	145057	217586	174068	253850	203080
24	600	Shaft Side (Pref.)	96377	120471	128502	160628	179903	224879	220167	275208	261287	326609	308405	385538
		Disc Side (N. Pref.)	132518	106014	176690	141352	247366	197893	302729	242183	359270	287416	424057	339245

### Notes:-

- \*Flow from stem side is the preferred flow direction. Flow from retainer side is non-preferred flow direction. Arrow on valve body indicates the preferred flow direction.
- 1. BTO - Break to Open; RTO - Run to Open; ETO - End to Open; BTC - Break to Close; RTC - Run to Close; ETC - End to Close. (Pref. ) = Preferred , (N. Pref.) = Non Preferred.
- 2. RTO, ETO, BTC, RTC= 0.4 x Max (BTO, ETC)
- 3. For actuator sizing, the minimum valve differential pressure shall be 10 bar. For differential pressures above 10 bar the intermediated values to be interpolated. For gear operator sizing, the full rated torque to be considered.
- 4. The published torque values are common for both laminar seal & metal seal without any factor of safety. For operator sizing, factor of 30% to be considered.
- 5. For valves with extension (cryogenic service / high temperature service), 1.5 times of preferred side BTO torque to be considered as a base torque without factor of safety and valves shall be offered as uni-directional. For operator sizing, factor of 30% to be considered.
- 6. The published torque values are without factor of safety.
- 7. The following factor of safety shall be considered for operator sizing:  
clean service (liquid, steam, clean gas and non-abrasive) = 1.3, high solids slurry = 1.5, Dry gas= 1.7

## 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.



# HOW TO ORDER

## Material



**Series**      **Size**      **Body**      **Disc**      **Stem**      **Seal**      **Pressure Rating**      **Operator**      **Special Requirement**

**Example:** Part Number for a Series 4B, Lug Style DelVal Triple Offset Valve, 4", CF8M Body w/ Stellite 21 body seat overlay, CF8M Disc, 17-4 Stem, S31803 + Graphite Seal, Class 150 Rated with a Gear Operator with Padlock and No Special Requirement would be

**4** **B** **0** **4** **0** **4** **4** **6** **D** **5** **G** **0**

Series	1
4A Wafer Class 150	4A
4B Lug Class 150	4B
4C Double Flanged Short Pattern Class 150	4C
4P Double Flanged Long Pattern Class 150	4P
4W Butt weld Class 150	4W
4D Wafer Class 300	4D
4E Lug Class 300	4E
4F Double Flanged Short Pattern Class 300	4F
4Q Double Flanged Long Pattern Class 300	4Q
4Y Butt weld Class 300	4Y
4G Wafer Class 600	4G
4H Lug Class 600	4H
4J Double Flanged Short Pattern Class 600	4J
4R Double Flanged Long Pattern Class 600	4R
4K Butt weld Class 600	4K
4U Double Flanged Class 900	4U
4T Double Flanged Class 1500	4T
4V Butt weld Class 1500	4V

Size	2
3"	030
4"	040
5"	050
6"	060
8"	080
10"	100
12"	120
14"	140
84"	840

	Body Material	3
Laminated Seal Configurations	ASTM A216 WCC+Stellite 21 body seat overlay	2
	ASTM A216 WCB+Stellite 21 body seat overlay	3
	ASTM A351 CF8M+Stellite 21 body seat overlay	4
	ASTM A995 5A+Stellite 21 body seat overlay	5
	ASTM A995 6A+Stellite 21 body seat overlay	6
	ASTM A995 4A+Stellite 21 body seat overlay	7
	ASTM A352 LCB+Stellite 21 body seat overlay	8
	ASTM A352 LCC+Stellite 21 body seat overlay	9
	ASTM A351 CF8+Stellite 21 body seat overlay	1
	ASTM A351 CN7M+Stellite 21 body seat overlay	A
	ASTM A351 CF3+Stellite 21 body seat overlay	B
	ASTM A351 CF3M+Stellite 21 body seat overlay	C
	ASTM A351 CF8C+Stellite 21 body seat overlay	D
	ASTM A351 CK3MCuN+Stellite 21 body seat overlay	E
	ASTM A351 CF10M+Stellite 21 body seat overlay	F
	ASTM A217 WC6+Stellite 21 body seat overlay	G
	ASTM A217 WC9+Stellite 21 body seat overlay	H
	ASTM A352 LC1+Stellite 21 body seat overlay	J
	ASTM A352 LC2+Stellite 21 body seat overlay	K
	Solid Metal Seal Configurations	ASTM A216 WCC+Stellite 6 body seat overlay
ASTM A216 WCB+Stellite 6 body seat overlay		M
ASTM A351 CF8M+Stellite 6 body seat overlay		N
ASTM A995 5A+Stellite 6 body seat overlay		0
ASTM A995 6A+Stellite 6 body seat overlay		P
ASTM A995 4A+Stellite 6 body seat overlay		Q
ASTM A352 LCB+Stellite 6 body seat overlay		R
ASTM A352 LCC+Stellite 6 body seat overlay		S
ASTM A351 CF8+Stellite 6 body seat overlay		T
ASTMA351 CN7M+Stellite 6 body seat overlay		U
ASTM A351 CF3+Stellite 6 body seat overlay	V	
ASTM A351 CF3M+Stellite 6 body seat overlay	W	
ASTM A 351 CF8C+Stellite 6 body seat overlay	X	
ASTM A351 CK3MCuN+Stellite 6 body seat overlay	Y	
ASTM A351 CFI10M+Stellite 6 body seat overlay	Z	

Disc Material	4
ASTM A351 CF8	1
ASTM A216 WCC + ENP	2
ASTM A216 WCB + ENP	3
ASTM A351CF8M	4
ASTM A995 5A	5
ASTM A995 6A	6
ASTM A995 4A	7
ASTM A352 LCB + ENP	8
ASTM A352 LCC + ENP	9
ASTM A351 CN7M	A
ASTM A351 CF3	B
ASTM A351 CF3M	C
ASTM A351 CF8C	D
ASTM A351 CK3MCuN	E
ASTM A351CF10M	F
ASTM A217 WC6 + ENP	G
ASTM A217 WC9 + ENP	H
ASTM A352 LC1 + ENP	J
ASTM A352 LC2 + ENP	K
ASTM 494 M35-1	M

Stem Material	5
ASTM B637 UNS N00718	4
ASTM A479 Type XM-19	5
ASTM A564 Type 630 17-4PH (H1150D)	6
ASTM A479 UNS S32760	7
ASTM A479 UNS S32750	8
ASTM A479 UNS S31803	9
ASTM B865 N05500	M
ASTM A564 Type 630 17-4PH (H900)	H
ASTM A479 410 Cond.3	3
ASTM A182 Gr.F51	D
ASTM A182 Gr.F53	F
ASTM A182 Gr.F55	S

Pressure Rating	7
Class 150	5
Class 300	6
Class 600	7
Class 900	8
Class 1500	9

Operator	8
Bare Stem	B
Spring Return Actuator - Fail Close	S
Spring Return Actuator - Fail Open	0
Electric Actuator	E
Gear Operator with Padlock	G
Gear Operator without Padlock	W

Special Requirement	9
No Special Requirements	0
Special Requirement	S
NSF Name Plate	N
Quad Material Grade Certified	Q
Dual Material Grade Certified	D

Seal Ring Material	6
S32750+Graphite	C
S31803+Graphite	D
S32760+Graphite	E
XM-19+Graphite	F
Inconel 625+Graphite	L
Inconel 718+Graphite	M
S31803+Stellite 21	G
S32750+Stellite 21	H
S32760+Stellite 21	J
XM-19+Stellite 21	K
SS316+Stellite 21	B

# 100% TESTING 100% SERIALIZATION



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