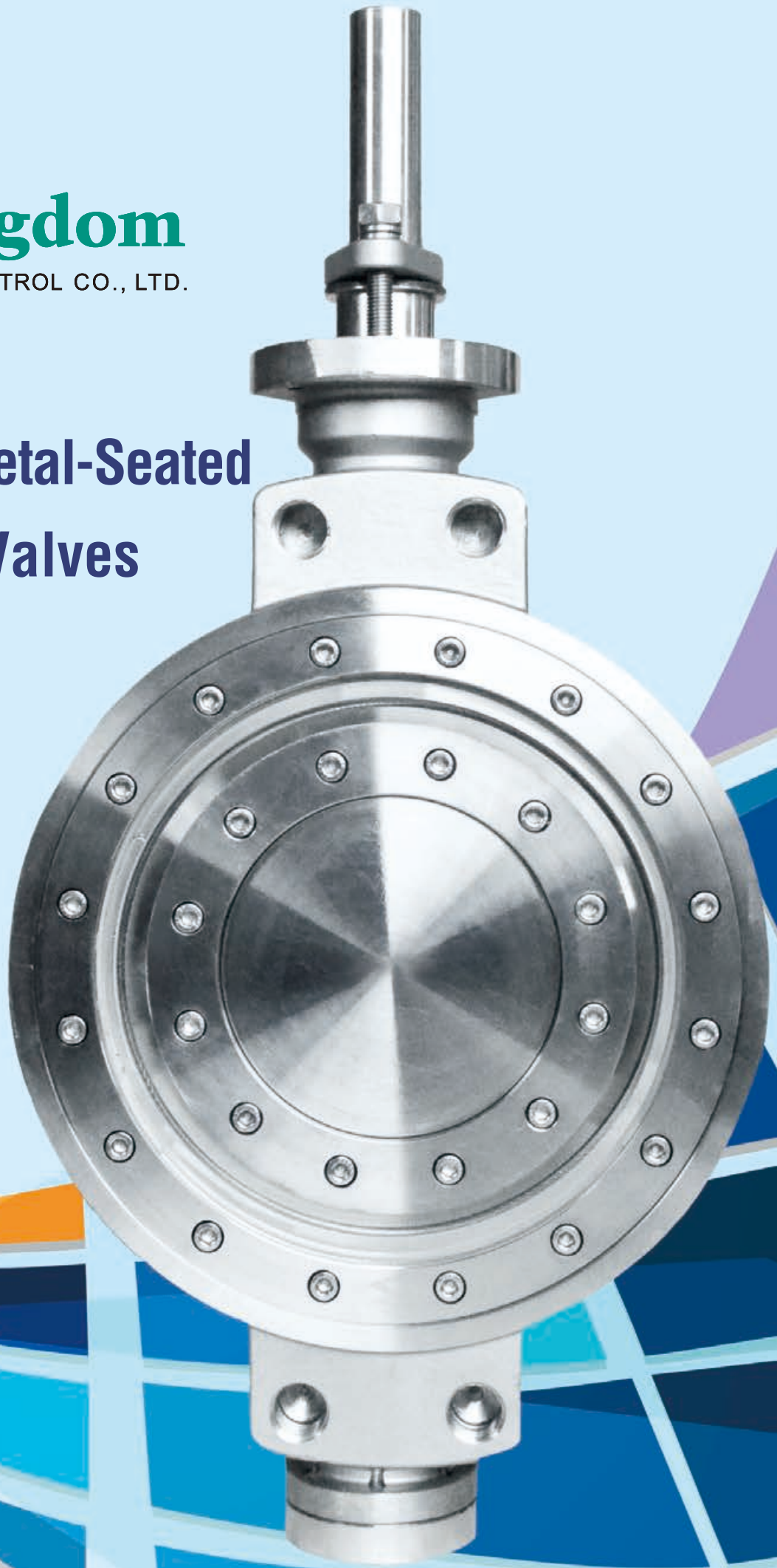




# Triple Offset Metal-Seated Butterfly Valves



## The Triple-offset Geometry

### »»» OFFSET 1

The shaft is offset from the centre of the seal and provides complete sealing contact.



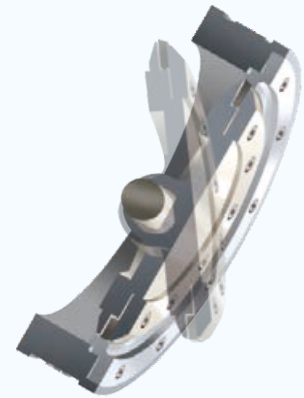
### »»» OFFSET 3

The axis of seat cone is offset from the shaft centerline. The geometry of the disc eliminates friction during operation and achieves integral & compression sealing.

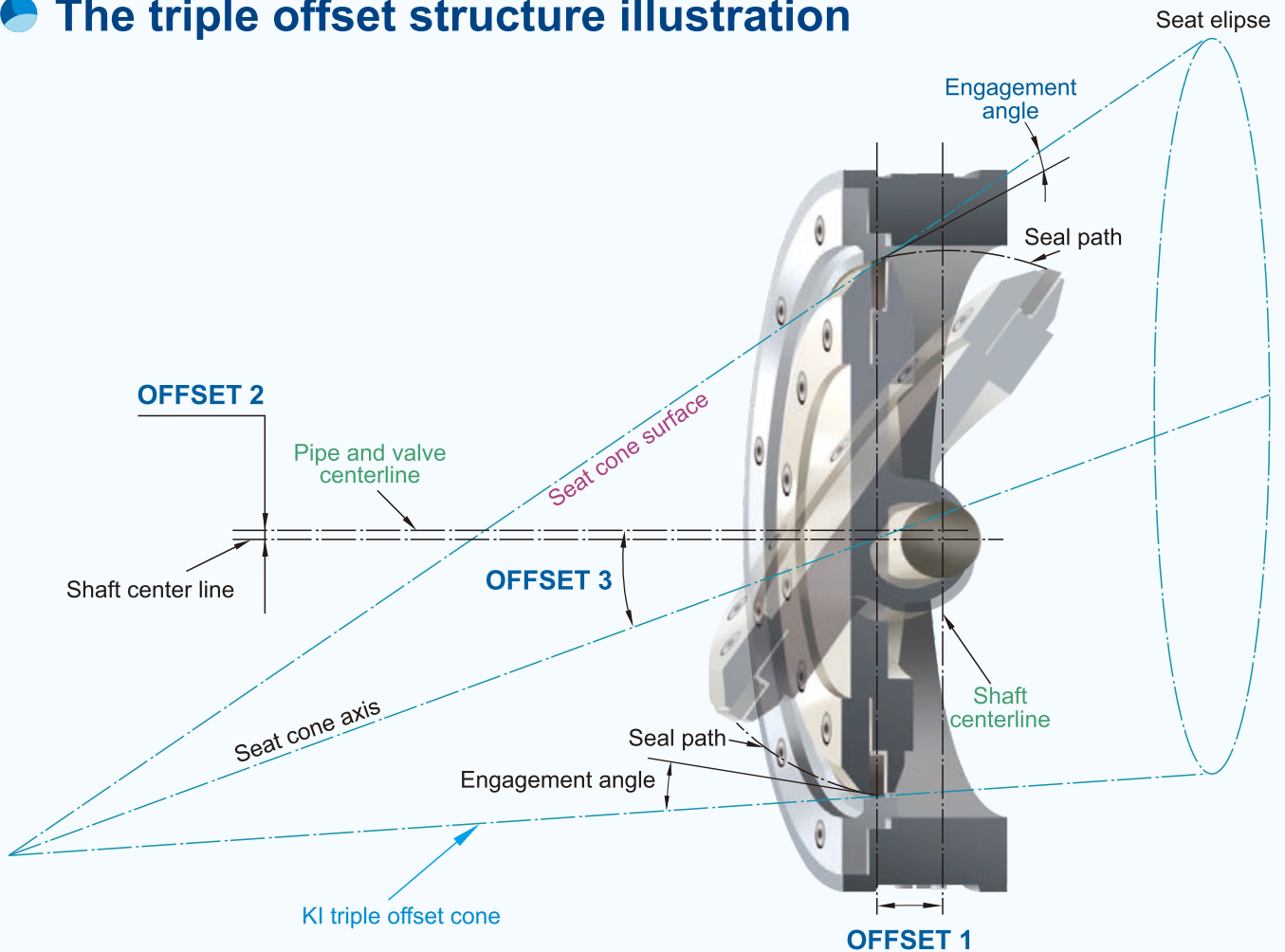


### »»» OFFSET 2

The shaft is offset from the centre of bore (pipe and valve) and provide interference-free opening and closing.



## The triple offset structure illustration



## Product Features

- Triple Offset Disc Rotation  
To minimize the rubbing of the seat & seal contact surface and achieve integrity sealing
- Replaceable Seat & Seals - Reduced maintenance cost
- Fire Safe Design Approved - According to ISO 10497
- Low Fugitive Emissions - ISO 15848-1 Approved
- Metal Seated Design to Meet Abrasive & Higher Temperature Application
- Leakage Rate: ANSI/FCI 70-2 Class V or better



## Design / Product Overview

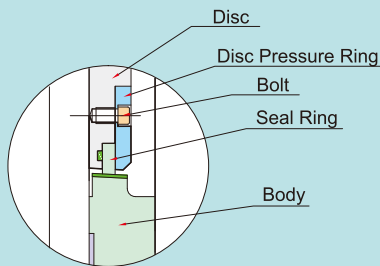
<b>Size</b>	NPS 3 ~ NPS 24	DN80~DN600
<b>Pressure Rating :</b>	Class150 ~ 300	PN16
<b>Material :</b>	Stainless Steel Carbon Steel Alloy Steel	
<b>End Connection :</b>	Wafer Type Flange Type	
<b>Temperature Range :</b>	-29°C ~ +425°C	
<b>Design</b>	API 609	DIN EN 593
<b>Face-to-Face</b>	API 609	DIN EN 558
<b>End Flanged</b>	ASME B16.5	DIN EN 1092-1
<b>Wall Thickness</b>	ASME B16.34	EN 12516-1

## Product Outline

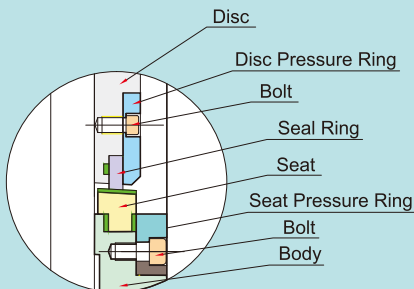
KI triple offset butterfly valve features bubble tight sealing at the lowest torque. Inherently fire-safe design with metal-to-metal sealing accredited according to ISO 10497. A wide range of hard plating (including Stellite) on seat and seal ring to meet variety of applications. The replaceable seat and seal system reduced the maintenance cost. Uniform peripheral sealing formed by elastic disc seal and valve seat ensure a tight sealing under rated pressure and temperature range.

### Replaceable Seat / Seal System

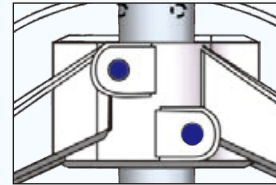
Reduce field maintenance costs



Traditional non-replaceable seat ring design



KI Replaceable seat ring design



### Lateral fixed pins

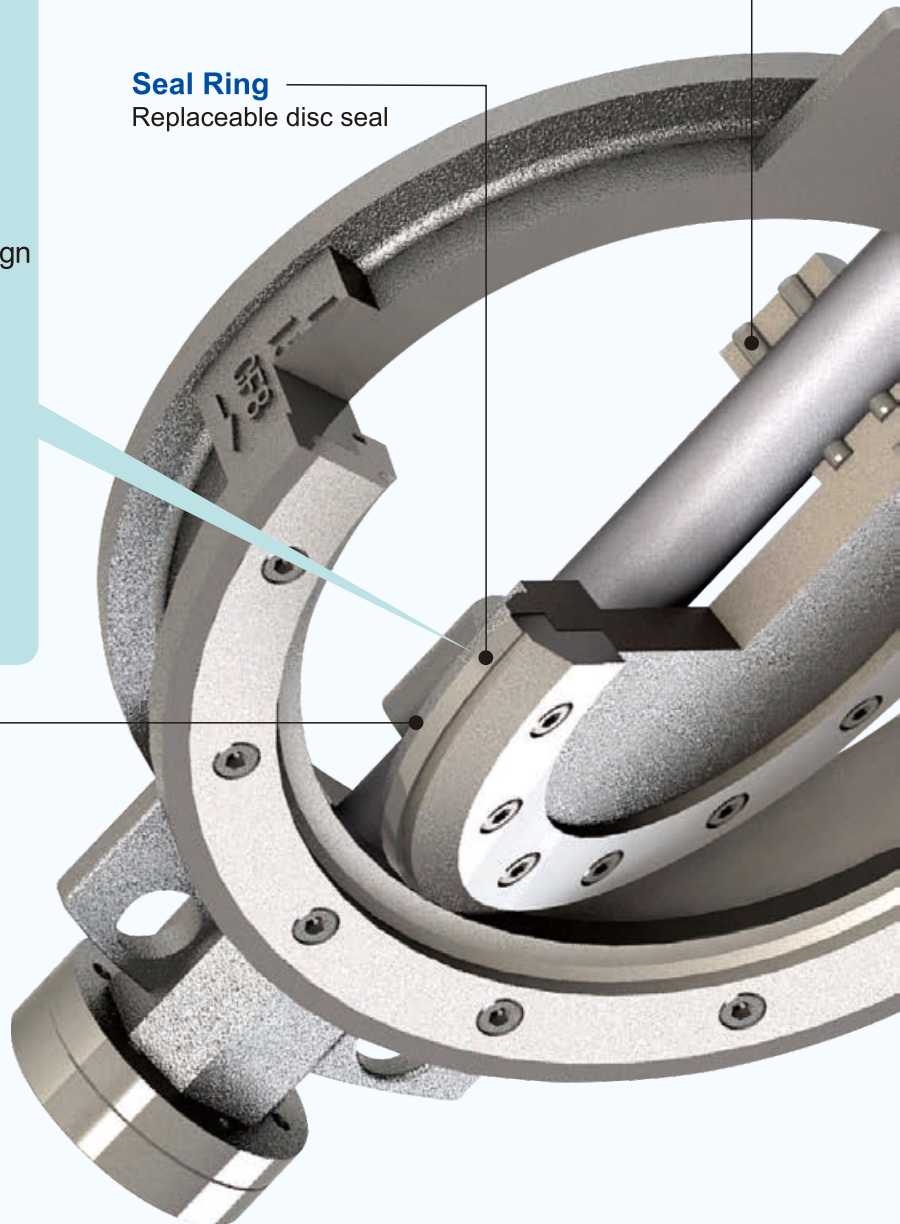
Ensure maximum stem strength

### Seal Ring

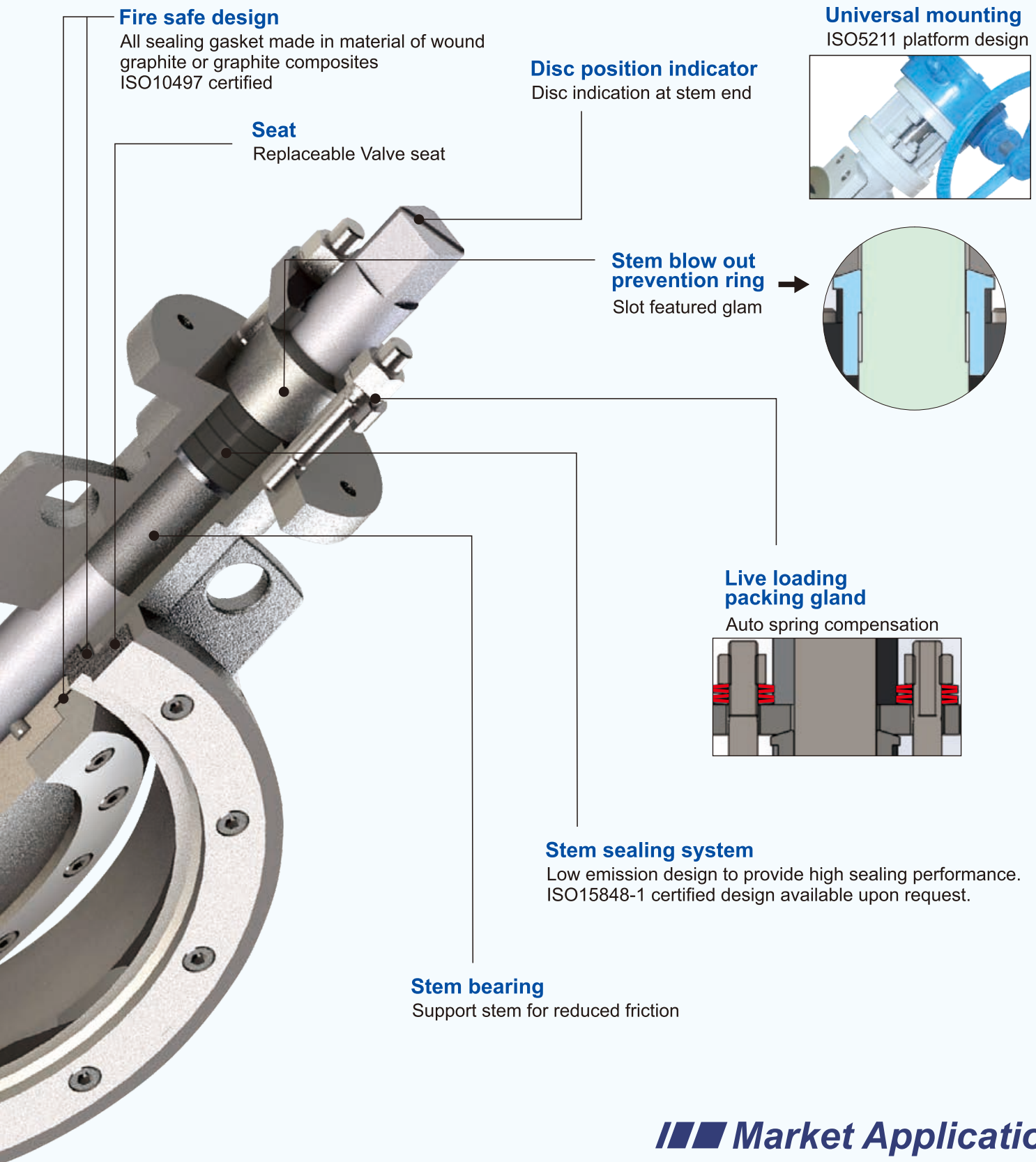
Replaceable disc seal

### Optimized butterfly footprint

Offering maximum strength along with maximum flow rate







## Market Applications



Refinery

Electric Power

Paper Mill

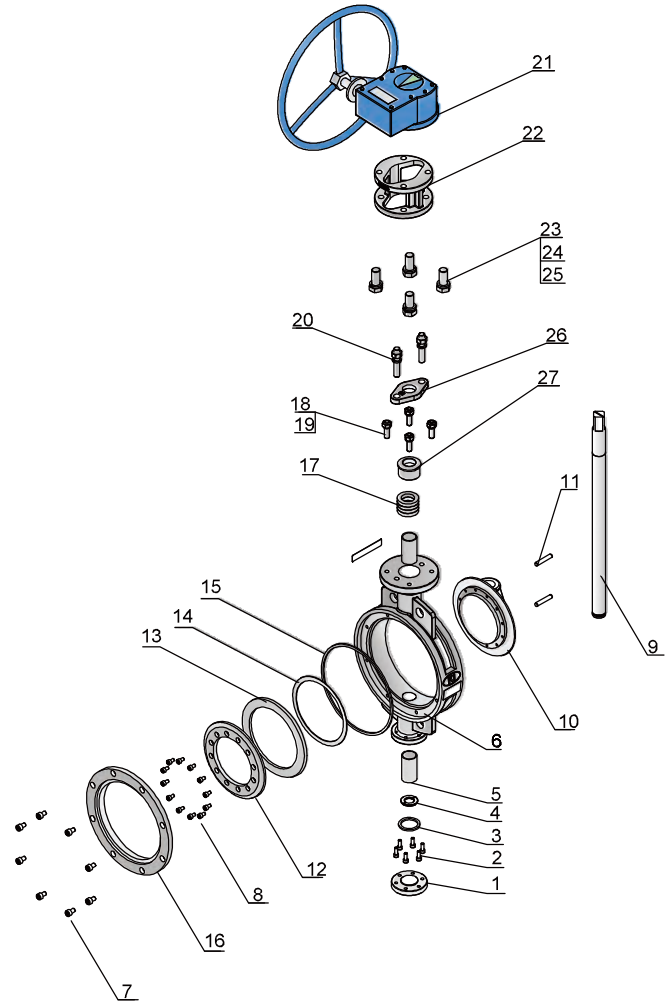
Petrochemical

Edible Oil

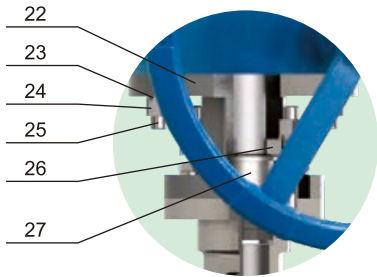
Other harsh conditions

### Applicable Standards:

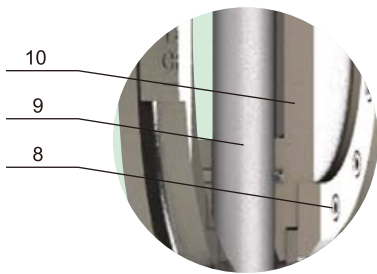
- Design : API 609 / DIN EN 593
- Rating : CLASS 150 - 300 / PN16
- Face to Face : API 609 / DIN EN 558
- End Flanged : ASME B16.5 / DIN EN 1092-1
- Inspection & Testing : API 598 / EN 12266
- Wall Thickness : ASME B16.34 / EN 12516-1
- Temperature : -29°C ~ +425°C



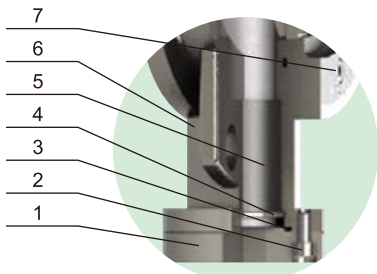
Details A



Details B

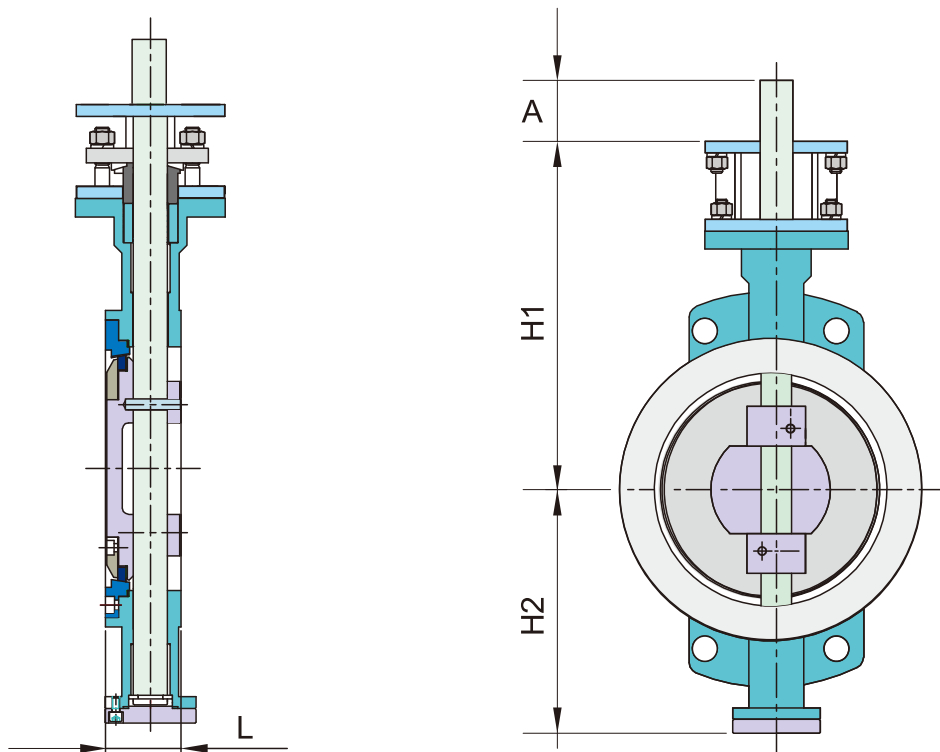


Details C



### MATERIAL OF CONSTRUCTION

Item	Component	Carbon Steel	Stainless Steel	
1	Bottom End Cap	A105	A182-F304	A182-F316
2	Bolt	8.8	A2-70	
3	Bottom End Cap Gasket	304SS+Grafoil		
4	Split Collar	304		
5	Sleeve	A276-316+QPQ		
6	Body	A216-WCB	A351-CF8	A351-CF8M
7	Bolt	A2-70		
8	Bolt	A2-70		
9	Stem	A564-630(17-4PH)		
10	Disc	A216-WCB	A351-CF8	A351-CF8M
11	Pin	329		
12	Disc Pressure Ring	A105	A182-F304	A182-F316
13	Seal Ring	A564-630(17-4PH)		
14	Disc Gasket	304SS+Graphite		
15	Body Gasket	304SS+Graphite		
16	Seat	A182-F304+STL	A182-F316+STL	
17	Stem Packing	Graphite		
18	Washer	SUS301		
19	Bolting Nut	8	A2-70	
20	Bolt	8.8	A2-70	
21	Gearbox	Assembly		
22	Yoke	A216-WCB		
23	Washer	SUS301		
24	Bolting Nut	8	A2-70	
25	Bolt	8.8	A2-70	
26	Gland Flange	A216-WCB	A351-CF8	A351-CF8M
27	Gland	A105	A276-304	A276-316



Unit : mm

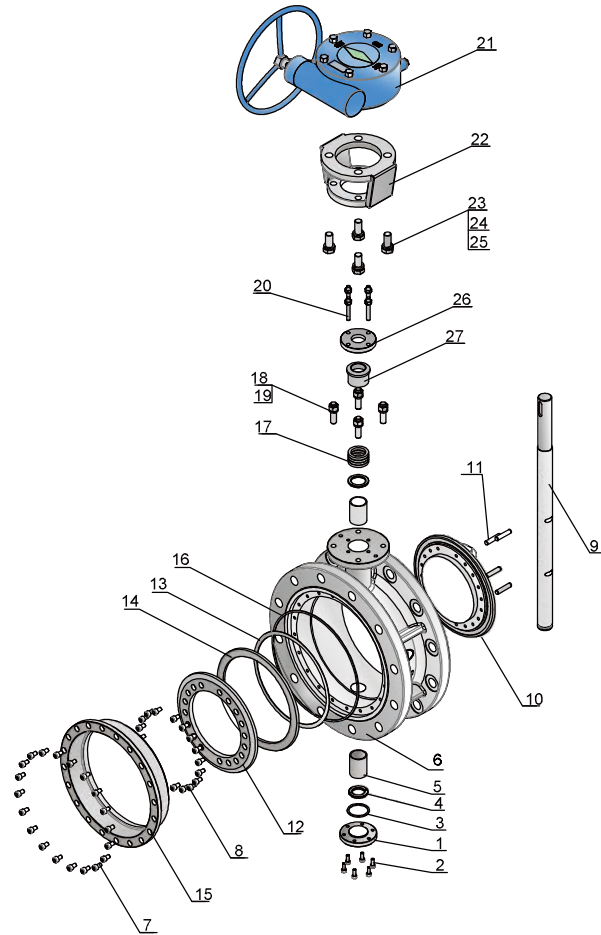
SIZE	Wafer type ASME CL. 150 (KB-M371)					Wafer type ASME CL. 300 (KB-M372)				
NPS	H1	H2	A (protrusion)	L	Weight (kg)	H1	H2	A (protrusion)	L	Weight (kg)
3	260	125	36	48	10	260	125	36	48	14
4	290	141	36	54	15	290	141	36	54	15
6	330	165	40	57	20	350	189	40	59	29
8	385	214	40	64	34	415	236	56	73	50
10	425	243	40	71	45	455	272	56	83	75
12	490	286	56	81	73	490	310	80	92	109
14	525	312	56	92	97	545	335	80	117	164
16	545	350	80	102	123	575	389	140	133	228
18	580	383	80	114	164	660	422	140	149	285
20	580	414	80	127	220	700	462	140	159	343
24	690	484	140	154	324	785	531	160	181	513

Unit : mm

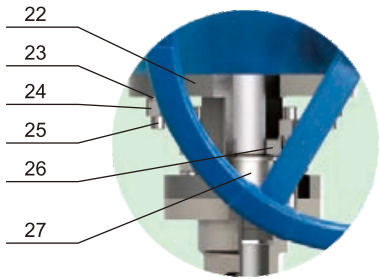
SIZE	Wafer type DIN PN16 (KB-M37K)				
DN	H1	H2	A (stem protrusion)	L	Weight (kg)
80	168	123	14	49	6.8
100	236	136	14	56	10.2
125	245	161	25	64	15.8
150	269	167	17	70	23.4
200	299	209	47	71	30.2
250	350	237	27	76	38.5
300	395	274	55	83	56.8
350	442	306	65	92	92
400	493	340	78	102	111.5
450	500	360	80	114	163
500	560	410	85	127	214.5
600	632	499	93	154	317.5

### Applicable Standards:

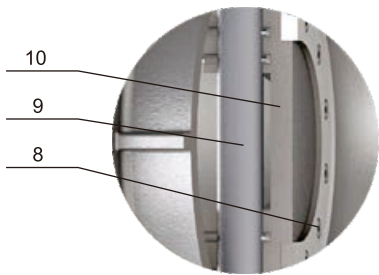
- Design : API 609 / DIN EN 593
- Rating : CLASS 150 - 300 / PN16
- Face to Face : API 609 / DIN EN 558
- End Flanged : ASME B16.5 / DIN EN 1092-1
- Inspection & Testing : API 598 / EN 12266
- Wall Thickness : ASME B16.34 / EN 12516-1
- Temperature : -29°C ~ +425°C



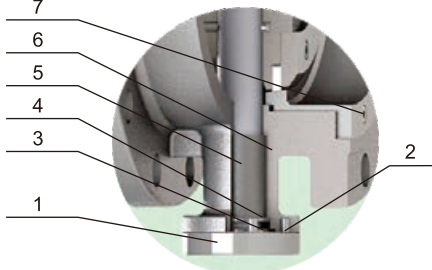
Details A



Details B



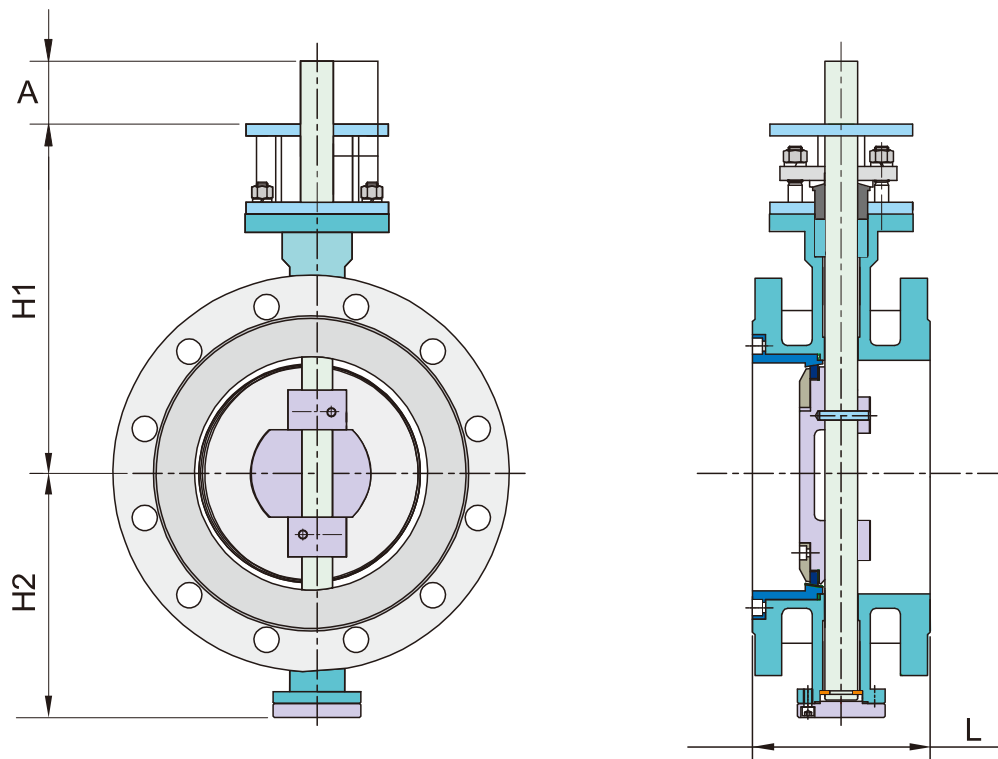
Details C



### MATERIAL OF CONSTRUCTION

Item	Component	Carbon Steel	Stainless Steel	
1	Bottom End Cap	A105	A182-F304	A182-F316
2	Bolt	8.8	A2-70	
3	Bottom End Cap Gasket	304SS+Grafoil		
4	Split Collar	304		
5	Sleeve	A276-316+QPQ		
6	Body	A216-WCB	A351-CF8	A351-CF8M
7	Bolt	A2-70		
8	Bolt	A2-70		
9	Stem	A564-630(17-4PH)		
10	Disc	A216-WCB	A351-CF8	A351-CF8M
11	Pin	329		
12	Disc Pressure Ring	A105	A182-F304	A182-F316
13	Disc Gasket	304SS+Grafoil		
14	Seal Ring	A564-630(17-4PH)		
15	Seat	A182-F304+STL	A182-F316+STL	
16	Body Gasket	304SS+Grafoil		
17	Stem Packing	Grafoil		
18	Washer	SUS301		
19	Bolting Nut	8	A2-70	
20	Bolt	8.8	A2-70	
21	Gearbox	Assembly		
22	Yoke	A216-WCB		
23	Washer	SUS301		
24	Bolting Nut	8	A2-70	
25	Bolt	8.8	A2-70	
26	Gland Flange	A216-WCB	A351-CF8	A351-CF8M
27	Gland	A105	A276-304	A276-316





Unit : mm

SIZE	Flange type ASME CL. 150 (KB-M341)					Flange type ASME CL. 300 (KB-M342)				
NPS	H1	H2	A (stem protrusion)	L	Weight (kg)	H1	H2	A (stem protrusion)	L	Weight (kg)
3	260	125	36	114	22	260	125	36	114	22
4	290	141	36	127	28	290	141	36	127	33
6	330	155	40	140	40	330	189	40	140	61
8	385	214	40	152	61	415	236	56	152	86
10	425	243	40	165	83	455	272	56	165	100
12	490	286	56	178	127	490	310	80	178	175
14	525	312	56	190	156	545	335	80	190	284
16	545	350	80	216	138	575	389	140	216	340
18	580	383	80	222	229	660	422	140	222	487
20	580	414	80	229	311	700	462	140	229	529
24	690	484	140	267	433	785	531	160	267	834
28	795	556	140	292	732	880	617	160	292	1382
30	865	611	160	318	848	1000	671	180	318	1595
32	865	611	160	318	1015	1000	671	180	318	1805
36	1000	736	160	330	1495	1150	801	200	330	2215
40	1130	801	180	410	2035	1150	801	200	410	2270
42	1130	801	180	410	2155	1215	900	250	410	2756
48	1267	866	200	470	3045	1300	991	280	470	3400

Unit : mm

SIZE	Flange type DIN PN16 (KB-M34K)				
DN	H1	H2	A (stem protrusion)	L	Weight (kg)
80	260	125	36	114	20
100	290	141	36	127	28
125	320	165	40	140	33
150	350	189	40	140	40
200	415	236	56	152	61
250	455	272	56	165	83
300	490	310	80	178	127
350	545	335	80	190	156
400	575	389	140	216	188
450	660	422	140	222	229
500	700	462	140	229	311
600	785	531	160	267	433

## Cv Value of Butterfly Valve

### Class 150 / PN 16

Size NPS	Percent of Rated Travel									
	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
3	10	23	37	55	75	99	123	136	146	155
4	19	44	77	123	163	213	276	330	351	369
6	36	108	185	263	370	507	688	875	1011	1063
8	55	172	315	462	626	889	1123	1423	1623	1678
10	103	255	468	846	1093	1378	1845	2371	2790	2956
12	166	415	701	1054	1515	2050	2720	3401	4038	4191
14	229	526	904	1304	1840	2833	3707	5517	7220	7527
16	383	554	988	1621	2552	3837	5590	7607	9442	10208
18	484	809	1470	2433	3680	5242	6901	8759	10657	12287
20	509	1123	1925	3088	4451	6388	8621	11436	14108	14725
24	539	1342	2475	4000	6146	9166	12772	16189	20629	23338
28	688	1535	2662	4521	6776	10420	15895	22110	29294	30800
30	715	1725	3293	5724	9254	14274	21723	30037	33550	34650
32	748	1828	3489	6065	9803	15121	23014	31821	37664	39600
36	867	2247	4316	7943	12596	19674	29850	42130	46871	49280
40	1320	3025	5720	9790	15950	24090	32670	44017	60576	63690
42	1432	3190	6160	10120	16500	25520	39050	55000	67980	71500
44	1485	3460	6681	10976	17896	27679	42354	59654	73732	77550
48	1656	4000	7724	12689	20686	31998	48963	68961	85237	89650

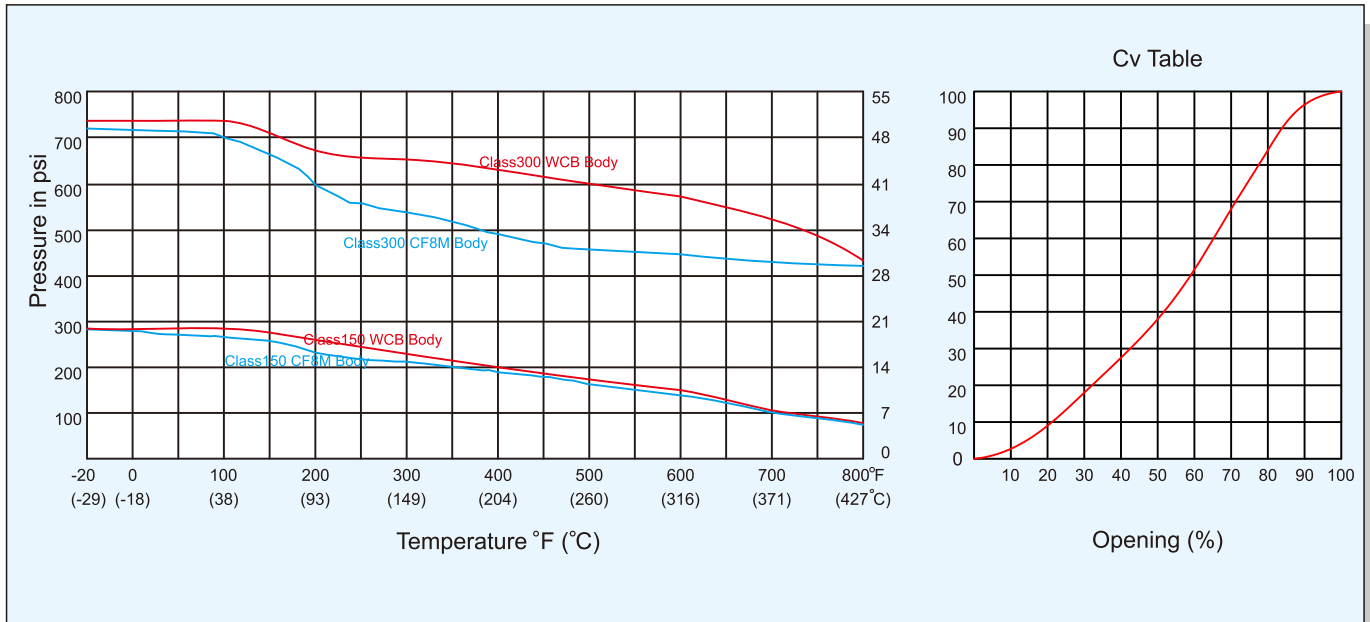
### Class 300

Size NPS	Percent of Rated Travel									
	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
3	9	17	30	48	64	94	120	130	141	150
4	14	42	74	118	132	177	205	227	245	260
6	33	86	161	254	313	418	483	567	646	661
8	52	95	279	415	605	847	1079	1190	1364	1390
10	101	152	451	682	986	1299	1593	1921	2609	2641
12	130	307	669	1035	1433	1918	2428	2885	3213	3425
14	205	398	706	1140	1654	2357	2879	3496	4311	4770
16	241	499	942	1604	2211	3529	4826	5939	7295	7636
18	286	726	1311	2177	2937	4698	6145	7662	9216	10029
20	385	1073	1816	2834	4320	6140	8415	10538	12934	14010
24	419	1087	2088	3713	5098	8078	10685	13416	16653	17992
28	472	1222	2340	3841	6000	10229	15752	22000	25905	26950
30	545	1394	2459	4322	6700	12210	19030	26180	31790	33330
32	550	1540	2970	5390	7800	13310	20460	29150	33990	35310
36	671	1738	3740	7040	11100	19360	29180	38610	44880	46750

• Note: Cv = 1.167Kv

## Technical Information

### Pressure - Temperature Chart



### Torque (N·m)

Size		Differential Pressure (bar)			
		20		50	
NPS	DN	close	open	close	open
3	80	79	89	134	154
4	100	108	132	188	236
6	150	150	267	334	430
8	200	265	423	525	1063
10	250	475	750	969	1724
12	300	676	1122	1371	2537
14	350	818	1529	1655	3283
16	400	1078	2099	2186	5613
18	450	1371	2783	2770	6405
20	500	1490	3277	3000	8327
24	600	2162	5456	4324	12821
28	700	5458	18389	—	—
30	750	6259	25311	—	—
32	800	7219	26900	—	—
36	900	10632	36319	—	—
40	1000	13159	44689	—	—
42	1050	14611	57523	—	—
48	1200	22853	70641	—	—

• Note: For actuator sizing, a safety factor of minimum 30% is recommended.

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KI-MBFV 201804(2.0)  
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