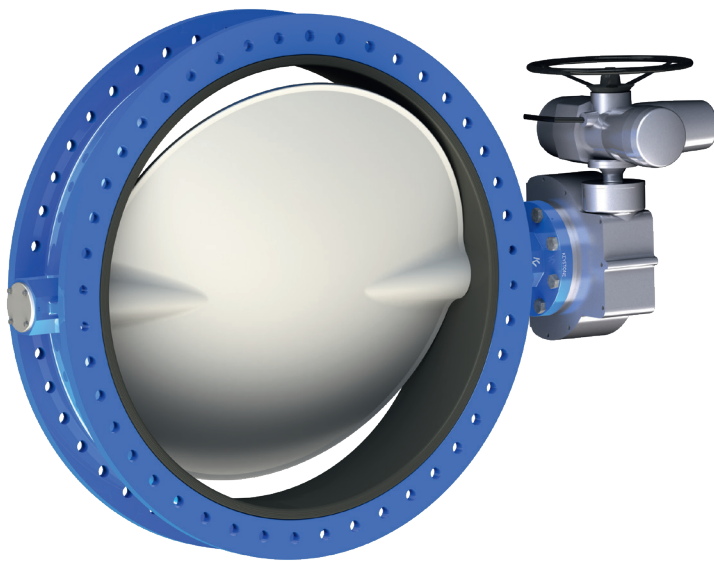




## KEYSTONE SERIES GRF RESILIENT SEATED BUTTERFLY VALVES

A heavy duty double flanged concentric design resilient seated butterfly valve



### FEATURES

- Double flanged body design with face-to-face dimensions, according to EN 558 Series 20, API 609 and AWWA C504 short.
- Designed according to EN 593 and API 609.
- The seat is field replaceable and fully isolates the body and shaft from the flow.
- Primary shaft sealing exceeds the pressure rating of the valve and prevents leakage through shaft area to atmosphere.
- A secondary shaft sealing provides back-up safety.
- A molded-in O-ring in the seat for flange sealing eliminates the need for gaskets.
- Shaft seals prevent moisture penetrating into the shaft area.
- Rounded polished disc edge gives full concentric sealing, lower torques, longer seat life and drop-tight shut-off.
- Extended body neck allows for pipe insulation.
- Top and bottom shaft bearings for optimized support and minimum friction and decreased torque.
- Top bushing absorbs actuator side thrust loads.
- All valves comply to Pressure Equipment Directive (97/23/EU) Module B1 + D, CE Marking.
- Available approvals: ABS, NSF/ANSI STD 61.

### GENERAL APPLICATION

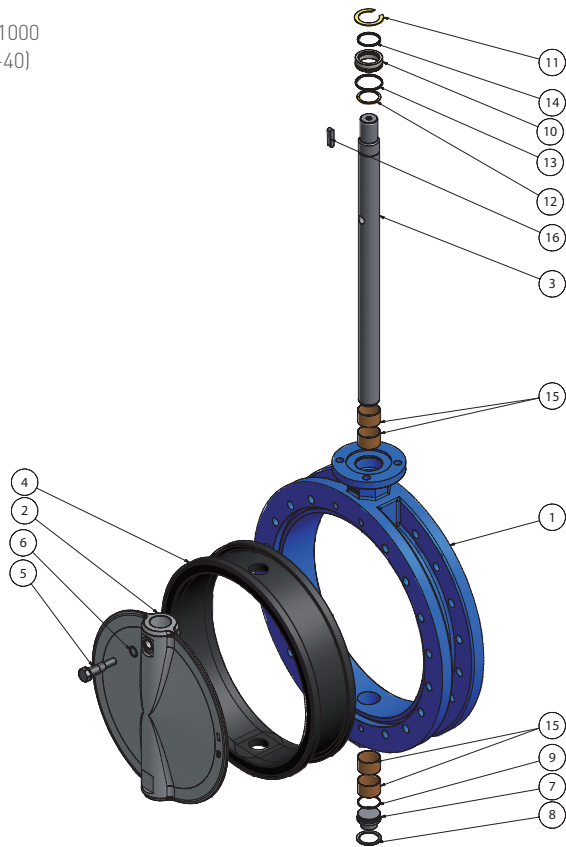
These valves are for water or air service where a drop-tight shut-off and double flanged body are required.

### TECHNICAL DATA

Sizes:	DN 600-1800 (NPS 24-72)
Pressure:	10 bar DN 600-1800 (150 psi NPS 24-72)
End of line:	6 bar DN 600-1800 (90 psi NPS 24-72)
Vacuum service:	0.4 bar (5.8 psia)
Temperature:	-40°C - +160°C (-40°F - +320°F)
Flange accommodation:	PN 10 ASME 125/150 AWWA C207 Table B/D/E JIS 10K AS4087 PN 16 AS2129 Table D/E
Flange facing:	Flat face (standard) Raised face (option)

# KEYSTONE SERIES GRF RESILIENT SEATED BUTTERFLY VALVES

DN 600-1000  
(NPS 24-40)



## PARTS LIST

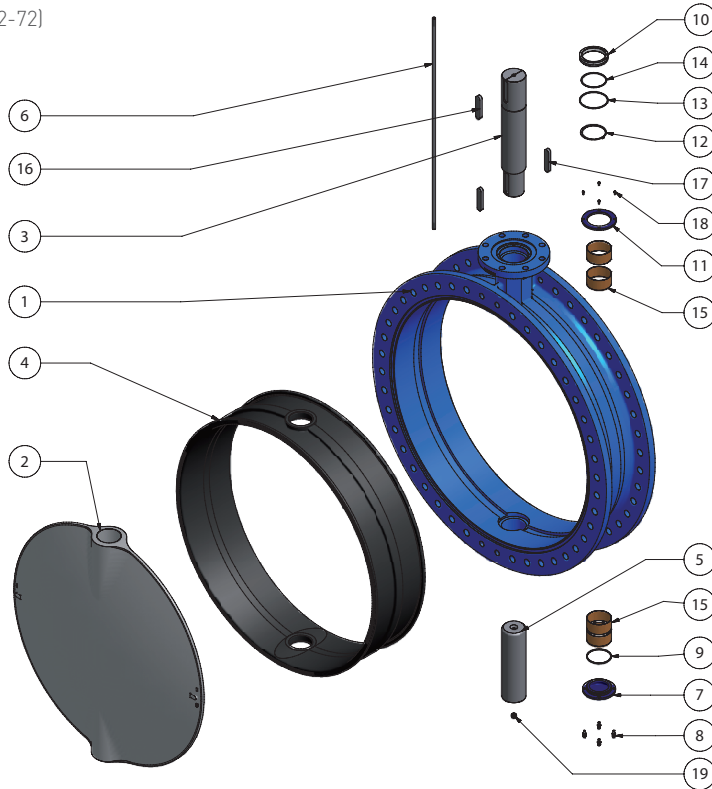
Item	Description	Qty
1	Body	1
2	Disc	1
3	Shaft	1
4	Seat	1
5	Disc screw	1
6	Disc screw O-ring	1
7	Plug	1
8	Plug circlip	1
9	Plug O-ring	1
10	Bushing	1
11	Body circlip	1
12	Shaft circlip	1
13	Body O-ring	1
14	Shaft O-ring	1
15	Bearing	4
16	Parallel key	1

## MATERIAL SPECIFICATION

Part name	Material	Material specification	Remark
Body	Ductile iron	ASTM A536 Gr 65-45-12	
	Ductile iron	ASTM A395 Gr 60-40-18	
	Carbon steel	ASTM A216 WCB	
	316 stainless steel	ASTM A351 CF8M	
Disc	316 stainless steel	ASTM A351 Gr CF8M - J92900	
	304 stainless steel	ASTM A351 Gr CF8 - J92600	
	Duplex	ASTM A890 Gr 4A - J92205 - CD3MN	
	Aluminium bronze	ASTM B148 C95200	
	Nickel aluminium bronze	ASTM B148 C95800	
	Ductile iron epoxy CTD	ASTM A536 Gr 65-45-12	Max. temp. 120°C (250°F)
	Ductile iron nylon CTD	ASTM A536 Gr 65-45-12	Max. temp. 60°C (140°F)
	Ductile iron FBE CTD	ASTM A536 Gr 65-45-12	Max. temp. 52°C (125°F) FBE - Fusion bond epoxy
Ductile iron ebonite lined	ASTM A536 Gr 65-45-12	Max. temp. 100°C (212°F)	
Shaft	431 stainless steel	ASTM A276 Gr 431 S43100	
	Duplex	ASTM A276 - S31803	
	Super duplex	ASTM A276 - S32750	[optional]
	K500 Monel®	ASTM B865 UNS N05500	
Seat	EPDM		Food grade
	NBR		Food grade
	Fluoroelastomer (FKM)		
Disc screw	Duplex	ASTM A276 - S31803	
Disc screw O-ring	EPDM		
	NBR		
	Fluoroelastomer (FKM)		
Plug	Carbon steel		
Plug circlip	Stainless steel		
Plug O-ring	NBR		
Bushing	Polyester		
Shaft/Body circlip	Stainless steel		
Shaft/Body O-ring	NBR		
Bearing	PTFE/steel		

# KEYSTONE SERIES GRF RESILIENT SEATED BUTTERFLY VALVES

DN 1050-1800  
(NPS 42-72)



## PARTS LIST

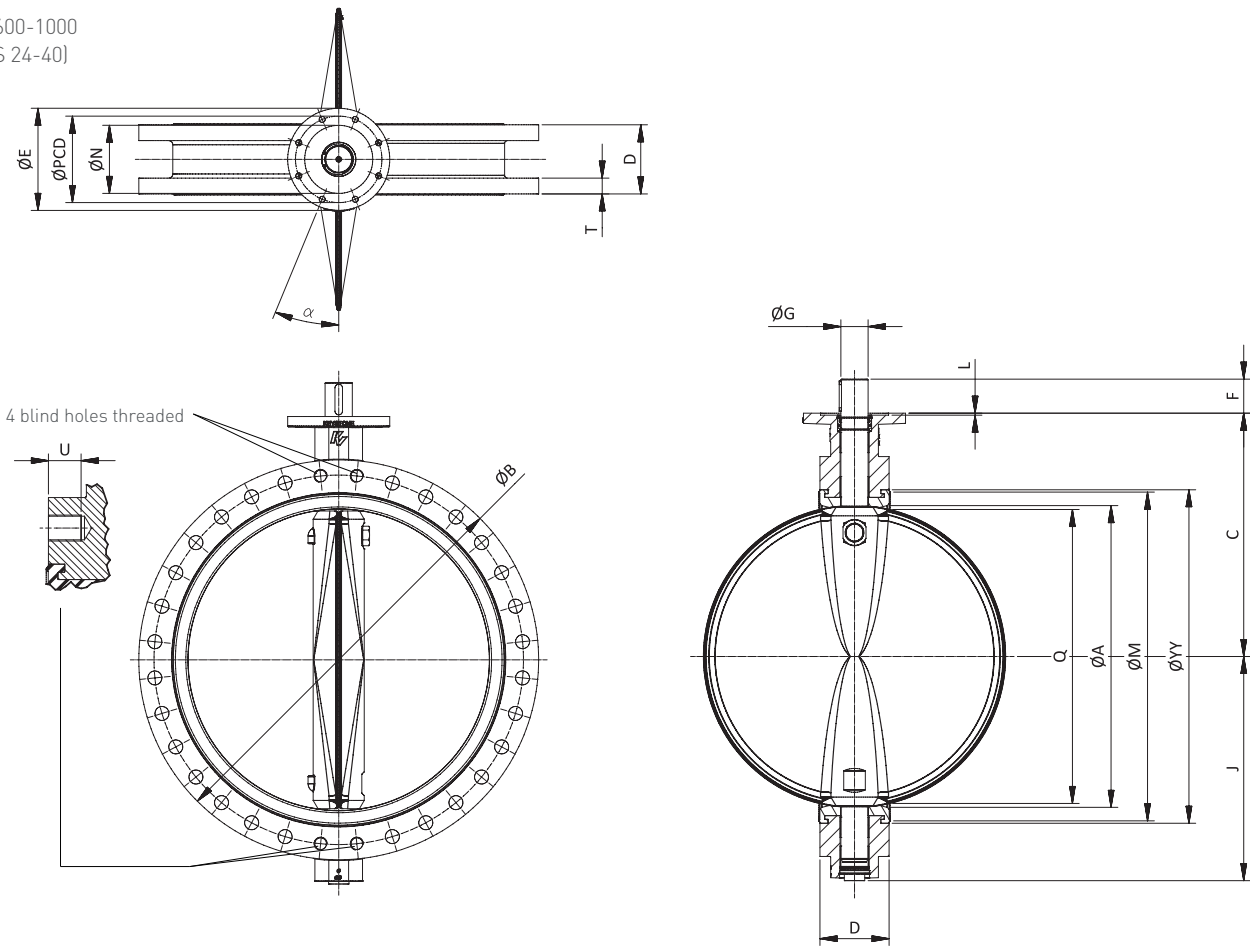
Item	Description	Qty
1	Body	1
2	Disc	1
3	Shaft	1
4	Seat	1
5	Bottom shaft	1
6	Through bolt	1
7	Bottom cover	1
8	Bottom cover screw	4
9	Bottom cover O-ring	1
10	Bushing	1
11	Bushing cover	1
12	Shaft circlip	1
13	Body O-ring	1
14	Shaft O-ring	1
15	Bearing	4
16	Parallel key	1
17	Parallel key disc shaft	2
18	Bushing cover screw	4
19	Lock nut	1

## MATERIAL SPECIFICATION

Part name	Material	Material specification	Remark
Body	Ductile iron	ASTM A536 Gr 65-45-12	
	Ductile iron	ASTM A395 Gr 60-40-18	
	Carbon steel	ASTM A216 WCB	
	316 stainless steel	ASTM A351 CF8M	
Disc	316 stainless steel	ASTM A351 Gr CF8M - J92900	
	304 stainless steel	ASTM A351 Gr CF8 - J92600	
	Duplex	ASTM A890 Gr 4A - J92205 - CD3MN	
	Aluminium bronze	ASTM B148 C95200	
	Nickel aluminium bronze	ASTM B148 C95800	
	Ductile iron epoxy CTD	ASTM A536 Gr 65-45-12	Max. temp. 120°C (250°F)
	Ductile iron nylon CTD	ASTM A536 Gr 65-45-12	Max. temp. 60°C (140°F)
	Ductile iron FBE CTD	ASTM A536 Gr 65-45-12	Max. temp. 52°C (125°F) FBE - Fusion bond epoxy
Shaft	Ductile iron ebonite lined	ASTM A536 Gr 65-45-12	Max. temp. 100°C (212°F)
	431 stainless steel	ASTM A276 Gr 431 S43100	
	Duplex	ASTM A276 - S31803	
	Super duplex	ASTM A276 - S32750	(optional)
Seat	K500 Monel®	ASTM B865 UNS N05500	
	EPDM		Food grade
	NBR		Food grade
Through bolt	Stainless steel		
Bottom cover	Ductile iron	ASTM A536 Gr 65-45-12	
Bottom cover screw	Steel class 8.8 - Zinc plated/coated		
Bottom cover O-ring	NBR		
Bushing	Polyester		
Bushing cover	Steel		
Shaft circlip	Stainless steel		
Shaft/Body O-ring	NBR		
Bearing	PTFE/steel		
Bushing cover screw	Steel class 8.8 - Zinc plated/coated		
Lock nut	Steel class 8 - Zinc plated/coated		

# KEYSTONE SERIES GRF RESILIENT SEATED BUTTERFLY VALVES

DN 600-1000  
(NPS 24-40)



## VALVE DIMENSIONS (mm)

Size (DN)	A	B	C	D	E	F	J	L	M	N	Q <sup>(1)</sup>	T	YY	Shaft		Top plate drilling			Tap		Weight <sup>(2)</sup> (kg)	
														G	Key	Bolt circle holes	No. a	Holes dia.	U	code		depth Adapt.
600	585	825	500	154	210	108	459	6	651	130	569	41	670	47.6	12.7 x 9.5	165	4	45°	22.0	40	DAJ	227
700	684	925	570	165	210	108	518	6	754	130	668	38	775	57.2	12.7 x 9.5	165	4	45°	22.0	40	DAK	293
750	734	995	605	165	210	108	551	6	810	130	720	43	835	57.2	12.7 x 9.5	165	4	45°	22.0	40	DAK	350
800	784	1060	640	190	300	90	583	6	857	200	767	43	880	73.0	19.0 x 12.7	254	8	22.5°	17.5	48	KAV	430
900	884	1175	715	203	300	140	659	6	957	200	867	47	980	73.0	19.0 x 12.7	254	8	22.5°	17.5	48	KAV	552
1000	984	1290	780	216	350	129	706	6	1057	230	968	50	1081	90.0	25.0 x 14.0	298	8	22.5°	22.0	48	F30	732

## VALVE DIMENSIONS (inches)

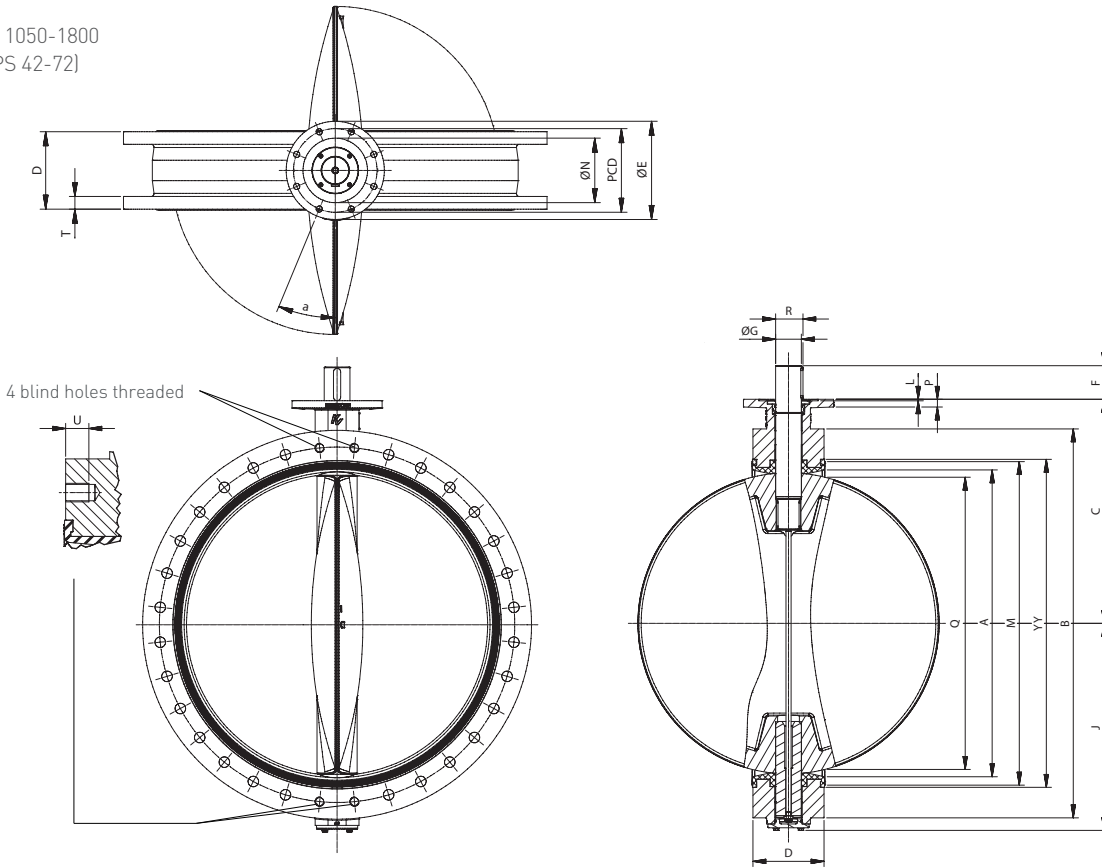
Size (NPS)	A	B	C	D	E	F	J	L	M	N	Q <sup>(1)</sup>	T	YY	Shaft		Top plate drilling			Tap		Weight <sup>(2)</sup> (lbs)	
														G	Key	Bolt circle holes	No. a	Holes dia.	U	code		depth Adapt.
24	23.03	32.48	19.69	6.06	8.27	4.25	17.97	0.24	25.64	5.12	22.41	1.62	26.38	1.88	1/2 x 3/8	6.5	4	45°	0.87	1.57	DAJ	500
28	26.93	36.42	22.44	6.50	8.27	4.25	20.41	0.24	29.67	5.12	26.29	1.50	30.51	2.25	1/2 x 3/8	6.5	4	45°	0.87	1.57	DAK	646
30	28.89	39.17	23.82	6.50	8.27	4.25	21.69	0.24	31.91	5.12	28.35	1.69	32.87	2.25	1/2 x 3/8	6.5	4	45°	0.87	1.57	DAK	772
32	30.85	41.73	25.20	7.48	11.81	3.54	22.95	0.24	33.76	7.87	30.22	1.69	34.65	2.88	3/4 x 1/2	10.0	8	22.5°	0.69	1.89	KAV	948
36	34.79	46.26	28.15	7.99	11.81	5.51	25.94	0.24	37.67	7.87	34.12	1.85	38.58	2.88	3/4 x 1/2	10.0	8	22.5°	0.69	1.89	KAV	1217
40	38.74	50.79	30.71	8.50	13.78	5.08	27.80	0.24	42.63	9.06	38.11	1.97	42.56	3.54	0.98 x 0.55	11.7	8	22.5°	0.87	1.89	F30	1614

## NOTES

1. 'Q' dimension is the minimum allowable pipe or flange inside diameter at the centered body face to protect the disc sealing edge against damage when opening the valve.
2. Weight may vary depending on trim materials used.
3. See installation, operation and maintenance manual (IOM) for detailed bolting information.

# KEYSTONE SERIES GRF RESILIENT SEATED BUTTERFLY VALVES

DN 1050-1800  
(NPS 42-72)



## VALVE DIMENSIONS (mm)

Size (DN)															Shaft			Top plate drilling			Tap				
	A	B	C	D	E	F	J	L	M	N	P	Q <sup>(1)</sup>	R	T	YY	G	Key	Key length	Bolt circle	No. holes	a	Holes dia.	U	Adapt. code	Weight <sup>(2)</sup> (kg)
1050	1060	1345	780	251	350	115	745	6	1132	230	30	1015	95	42.5	1149.5	90	25 x 14	110	298	8	22.5	22	42.5	F30	735
1100	1083	1405	815	254	350	115	777	6	1155	230	30	1038	106	42.5	1172.5	100	28 x 16	110	298	8	22.5	22	42.5	F30	855
1200	1184	1510	870	276	350	130	845	6	1256	230	30	1137	106	45.0	1273.5	100	28 x 16	125	298	8	22.5	22	45.0	F30	1025
1350	1327	1685	975	381	415	165	895	6	1399	260	45	1256	106	46.0	1416.5	100	28 x 16	160	356	8	22.5	33	46.0	F35	1406
1400	1381	1745	1010	280	415	165	918	6	1453	260	45	1338	117	46.0	1470.5	110	28 x 16	160	356	8	22.5	33	46.0	F35	1421
1500	1482	1855	1080	381	415	165	989	6	1554	260	45	1417	138	47.5	1571.5	130	32 x 18	160	356	8	22.5	33	47.5	F35	1786
1600	1591	1910	1150	318	415	165	1038	6	1663	260	45	1544	148	49.0	1680.5	140	36 x 20	160	356	8	22.5	33	49.0	F35	1863
1650	1664	2032	1185	457	415	165	1082	6	1736	260	45	1585	148	50.0	1753.5	140	36 x 20	160	356	8	22.5	33	50.0	F35	2243
1800	1785	2195	1290	457	475	185	1209	9	1857	300	54	1711	169	52.0	1874.5	160	40 x 22	180	406	8	22.5	39	52.0	F40	2828

## VALVE DIMENSIONS (inches)

Size (NPS)															Shaft			Top plate drilling			Tap				
	A	B	C	D	E	F	J	L	M	N	P	Q <sup>(1)</sup>	R	T	YY	G	Key	Key length	Bolt circle	No. holes	a	Holes dia.	U	Adapt. code	Weight <sup>(2)</sup> (lbs)
42	41.73	52.95	30.71	9.88	13.78	4.53	29.33	0.24	44.57	9.06	1.18	39.96	3.74	1.67	45.26	3.54	0.98 x 0.55	4.33	11.73	8	22.5	0.87	1.67	F30	1620
44	42.64	55.32	32.09	10.00	13.78	4.53	30.59	0.24	45.47	9.06	1.18	40.87	4.17	1.67	46.16	3.94	1.10 x 0.63	4.33	11.73	8	22.5	0.87	1.67	F30	1885
48	46.61	59.45	34.25	10.87	13.78	5.12	33.27	0.24	49.45	9.06	1.18	44.76	4.17	1.77	50.14	3.94	1.10 x 0.63	4.92	11.73	8	22.5	0.87	1.77	F30	2260
54	52.24	66.34	38.39	15.00	16.34	6.50	35.24	0.24	55.08	10.24	1.77	49.45	4.17	1.81	55.77	3.94	1.10 x 0.63	6.30	14.02	8	22.5	1.30	1.81	F35	3100
56	54.37	68.70	39.76	11.02	16.34	6.50	36.14	0.24	57.21	10.24	1.77	52.68	4.61	1.81	57.89	4.33	1.10 x 0.63	6.30	14.02	8	22.5	1.30	1.81	F35	3133
60	58.35	73.03	42.52	15.00	16.34	6.50	38.94	0.24	61.18	10.24	1.77	55.79	5.43	1.87	61.87	5.12	1.26 x 0.71	6.30	14.02	8	22.5	1.30	1.87	F35	3937
64	62.64	75.20	45.28	12.52	16.34	6.50	40.87	0.24	65.47	10.24	1.77	60.79	5.83	1.93	66.16	5.51	1.42 x 0.79	6.30	14.02	8	22.5	1.30	1.93	F35	4107
66	65.51	80.00	46.65	17.99	16.34	6.50	42.60	0.24	68.35	10.24	1.77	62.40	5.83	1.97	69.04	5.51	1.42 x 0.79	6.30	14.02	8	22.5	1.30	1.97	F35	4945
72	70.28	86.42	50.79	17.99	18.70	7.28	47.60	0.35	73.11	11.81	2.13	67.36	6.65	2.05	73.80	6.30	1.58 x 0.87	7.09	15.98	8	22.5	1.54	2.05	F40	6235

## NOTES

1. 'Q' dimension is the minimum allowable pipe or flange inside diameter at the centered body face to protect the disc sealing edge against damage when opening the valve.
2. Weight may vary depending on trim materials used.
3. See installation, operation and maintenance manual (IOM) for detailed bolting information.

# KEYSTONE SERIES GRF RESILIENT SEATED BUTTERFLY VALVES

## METRIC TABLES

### TORQUE APPLICATION FACTOR CATEGORIES

#### Application I

Clean liquid lubricating media (water, clean oils, lube oil, mineral oil, etc.); and with no deposit or chemical attack, valve operated at least once a week. Temperature range from 0°C (32°F) to maximum temperature rating of the elastomer seat.

#### Application II

Other liquid media and lubricating gases (aqueous liquids, such as food and beverage, water, etc.); and with minor deposit or chemical attack, valve operated at least once a month.

Temperature range from 0°C (-14°F) to maximum temperature rating of the elastomer seat.

#### Application III

a. Dry non-abrasive media or gases (non-abrasive powders and dry gas); or

b. Fluids with moderate deposit or chemical attack; or

c. Valves operated less than once a month.

Temperature range from 0°C (32°F) to maximum temperature rating of the elastomer seat.

#### Application IV

a. Dry abrasive media and degreasing applications (sand, cement, silicone free, oxygen cleaned); or

b. Liquids with severe deposit; or

c. Valves not frequently operated (once a year).

All above with temperature range from -10°C (-14°F) to maximum temperature rating of the elastomer seat.

#### NOTES

- For applications with temperatures above or below the guidelines above, please consult factory.
- For dry service valves it is suggested to use U/C discs (reduced diameter) when service conditions are less than 3.5 bar (50 psi).

### VALVE SEATING AND UNSEATING TORQUES (Nm)

Application ΔP (bar)	Valve size (DN)														
	600	700	750	800	900	1000	1050	1100	1200	1350	1400	1500	1600	1650	1800
<b>I</b>															
3.5	1700	2494	2967	3495	4422	5831	6428	7505	8931	11982	12885	16469	19692	20942	27338
7	1979	2943	3521	4169	5275	7022	7742	9114	10846	14657	15762	20393	24511	26066	34331
10	2373	3575	4302 <sup>(1)</sup>	5120	6479	8704	9595	11385	13548	18433	19824	25935	31316	33304	44212
3.5 (U/C)	1020	1497	1780	2097	2653	3498	3857	4503	5359	7189	7731	9881	11815	12565	16403
<b>II</b>															
3.5	1877	2736	3245	3811	4822	6325	6973	8103	9643	12882	13854	17581	20957	22287	28938
7	2153	3180	3793	4479	5667	7506	8275	9699	11542	15538	16710	21481	25749	27383	35898
10	2542	3804	4565 <sup>(1)</sup>	5419	6858	9172	10111	11951	14222	19286	20741	26988	32514	34578	45728
3.5 (U/C)	1126	1642	1947	2287	2893	3795	4184	4862	5786	7729	8312	10548	12574	13372	17363
<b>III</b>															
3.5	2055	2978	3523	4127	5222	6819	7517	8701	10354	13782	14822	18692	22221	23632	30539
7	2328	3417	4065 <sup>(1)</sup>	4788	6059	7990	8808	10285	12239	16420	17658	22569	26987	28699	37465
10	2710	4034 <sup>(1)</sup>	4828 <sup>(1,2)</sup>	5719 <sup>(2)</sup>	7237	9640	10627	12518	14896	20139	21658	28041	33713	35852	47244
3.5 (U/C)	1233	1787	2114	2476	3133	4091	4510	5221	6212	8269	8893	11215	13333	14179	18323
<b>IV</b>															
3.5	2322	3341	3940	4601	5822	7560	8334	9598	11421	15133	16274	20359	24118	25649	32940
7	2589	3772	4473 <sup>(1)</sup>	5252	6646	8715	9608	11162	13283	17742	19080	24202	28844	30674	39815
10	2963	4378 <sup>(1)</sup>	5223 <sup>(1,2)</sup>	6168 <sup>(2)</sup>	7805	10342	11401	13367	15907	21418	23034	29621	35510	37763	49519
3.5 (U/C)	1393	2005	2364	2761	3493	4536	5001	5759	6853	9080	9765	12216	14471	15389	19764

#### NOTES

3.5 U/C refers to reduced diameter disc option.

- Use a minimum of Class 8.8 steel bolts to connect actuator to valve.
- Duplex shaft not suitable for these conditions, use only 431 stainless steel or super duplex.

### MAXIMUM ALLOWABLE SHAFT TORQUES (Nm)

Shaft material	Valve size (DN)														
	600	700	750	800	900	1000	1050	1100	1200	1350	1400	1500	1600	1650	1800
431SS (ASTM A276 - Gr 431 S43100)	5086	6312	7128	7088	14740	18900	16065	19680	23280	34848	34848	44928	52080	52080	73920
Duplex (ASTM A276 - S31803)	3815	4734	5346	5316	11055	14175	12049	14760	17460	26136	26136	33696	39060	39060	55440
Super duplex (ASTM A276 - S32750)	4366	5418	6118	6084	12652	16233	13789	16892	19982	29911	29911	38563	44702	44702	63448
Monel K500 (ASTM B865 UNS N05500)	3713	5250	5250	6300	9520	16750	13383	16400	19400	26400	29040	31440	43400	43400	61600

# KEYSTONE SERIES GRF RESILIENT SEATED BUTTERFLY VALVES

## IMPERIAL TABLES

### VALVE SEATING AND UNSEATING TORQUES (in lbs)

Application ΔP (psi)	Valve size (NPS)														
	24	28	30	32	36	40	42	44	48	54	56	60	64	66	72
<b>I</b>															
50	15043	22076	26264	30933	39137	51608	56893	66429	79048	106048	114045	145764	174289	185350	241959
100	17518	26045	31164	36899	46688	62153	68519	80668	95994	129723	139507	180496	216937	230705	303858
150	21007	31641	38074 <sup>(1)</sup>	45315	57340	77033	84924	100766	119912	163148	175453	229545	277173	294764	391305
50 (U/C)	9026	13246	15758	18560	23482	30960	34136	39858	47429	63629	68427	87458	104574	111210	145175
<b>II</b>															
50	16617	24218	28723	33731	42679	55980	61713	71720	85344	114016	122615	155601	185482	197253	256125
100	19059	28142	33572	39638	50155	66433	73238	85847	102157	137524	147896	190126	227894	242357	317726
150	22498	33670	40404 <sup>(1)</sup>	47966	60695	81175	89491	105778	125876	170697	183572	238865	287777	306041	404726
50 (U/C)	9970	14531	17234	20239	25607	33589	37028	43032	51206	68410	73569	93361	111289	118352	153675
<b>III</b>															
50	18191	26361	31183	36529	46220	60352	66534	77010	91640	121985	131185	165439	196675	209157	270291
100	20600	30239	35979 <sup>(1)</sup>	42378	53622	70713	77957	91027	108321	145325	156286	199757	238852	254010	331594
150	23989	35700 <sup>(1)</sup>	42734 <sup>(1,2)</sup>	50617 <sup>(2)</sup>	64050	85317	94057	110790	131841	178246	191690	248185	298381	317318	418147
50 (U/C)	10915	15817	18710	21918	27732	36208	39920	46206	54984	73191	78711	99263	118005	125494	162175
<b>IV</b>															
50	20552	29575	34872	40727	51533	66911	73764	84946	101084	133937	144039	180195	213465	227012	291540
100	22912	33385	39591 <sup>(1)</sup>	46487	58823	77134	85035	98795	117566	157026	168870	214203	255288	271490	352396
150	26226	38744 <sup>(1)</sup>	46229 <sup>(1,2)</sup>	54593 <sup>(2)</sup>	69083	91530	100907	118308	140788	189569	203868	262165	314287	334234	438277
50 (U/C)	12331	17745	20923	24436	30920	40147	44259	50967	60650	80362	86423	108117	128079	136207	174924

### NOTES

50 U/C refers to reduced diameter disc option.

1. Use a minimum of ASTM A193 Grade B7 steel bolts to connect actuator to valve.
2. Duplex shaft not suitable for these conditions, use only 431 stainless steel or super duplex.

### MAXIMUM ALLOWABLE SHAFT TORQUES (in lbs)

Shaft material	Valve size (NPS)														
	24	28	30	32	36	40	42	44	48	54	56	60	64	66	72
431SS (ASTM A276 - Gr 431 S43100)	45010	55860	63100	62750	130500	167279	142187	174183	206045	308431	308431	397646	460947	460947	654247
Duplex (ASTM A276 - S31803)	33770	41900	47300	47050	97900	125459	106643	130637	154534	231323	231323	298235	345710	345710	490685
Super duplex (ASTM A276 - S32750)	38640	47950	54150	53850	112000	143674	122043	149507	176856	264735	264735	341311	395646	395646	561562

# KEYSTONE SERIES GRF RESILIENT SEATED BUTTERFLY VALVES

## METRIC TABLES

### FLOWRATE CO-EFFICIENTS - $K_v$ VALUES

Size (DN)	Disc opening (degrees)								
	10°	20°	30°	40°	50°	60°	70°	80°	90°
600	349	894	1871	3357	5689	9140	14723	26357	30583
700	475	1216	2547	4569	7744	12440	20040	35875	41626
750	545	1396	2924	5245	8890	14281	23005	41183	47785
800	620	1589	3327	5968	10114	16248	26174	46857	54369
900	785	2011	4211	7553	12801	20564	33127	59303	68811
1000	969	2483	5197	9325	15803	25389	40897	73214	84953
1050	1068	2737	5732	10280	17423	27656	50010	85811	95862
1100	1172	3004	6290	11283	19122	30353	54886	94178	105209
1200	1395	3575	7486	13428	22757	36122	65319	112079	125208
1350	1766	4524	9475	16994	28802	45717	82670	141850	158466
1400	1899	4866	10189	18276	30975	49167	88907	152552	170422
1500	2180	5586	11697	20981	35558	56441	102061	175124	195637
1600	2480	6355	13309	23871	40457	64218	116123	199252	222591
1650	2638	6759	14153	25386	43025	68294	123494	211900	236721
1800	3139	8043	16844	30212	51204	81275	146968	252178	281717

### NOTE

$K_v$  = The volume of water in m<sup>3</sup>/hr that will pass through a valve with a pressure drop of 1 bar at 20°C

### PRESSURE-TEMPERATURE DIAGRAM

Seat material	Disc material	Body material	Size range (DN)	Valve rating**	Temperature (°C)										
					-40	-28	-18	0	50	100	120	130	150	160	
EPDM	All metal	DI A536 65-45-12/ CS A216 WCB/ SS A351 CF8M	600-1800	Std / EOL				10 bar / 6 bar							
EPDM	All metal	DI A395 60-40-18	600-1800	Std / EOL				10 bar / 6 bar							
NBR/NBR white	All metal	DI A536 65-45-12/ CS A216 WCB/ SS A351 CF8M	600-1800	Std / EOL				10 bar / 6 bar							
FKM	All metal	DI A536 65-45-12/ CS A216 WCB/ SS A351 CF8M	600-1000	Std / EOL				10 bar / 6 bar					6 bar / 4 bar		

\*\* Standard / End of line

### TEMPERATURE PERFORMANCE COATED DISC

Disc material	Coating	Size range (DN)	°C
DI A536 65-45-12 / A395 60-40-18	DI epoxy coated	600-1800	-28 to 120 / -40 to 120
DI A536 65-45-12 / A395 60-40-18	DI nylon coated	600-1800	-28 to 60 / -40 to 60
DI A536 65-45-12 / A395 60-40-18	DI FBE coated	600-1800	-28 to 52 / -40 to 52
DI A536 65-45-12 / A395 60-40-18	DI ebonite coated	600-1800	-28 to 100 / -40 to 100

### POSSIBLE FLANGE DRILLINGS

Flange drilling	Valve size (DN)	Valve size (DN)														
		600	700	750	800	900	1000	1050	1100	1200	1350	1400	1500	1600	1650	1800
EN 1092	PN 10			N/A				N/A			N/A		N/A		N/A	
ISO 2084	PN 10							N/A			N/A				N/A	
ASME B16.5	Class 150	See B16.47A														
ASME B16.1	Class 125		N/A		N/A		N/A		N/A			N/A			N/A	
ASME B16.47A	Class 150	See B16.5														
AWWA C207	Table B/D/E											N/A		N/A		
MSS SP44	Class 150															N/A
ASME B16.47B	Class 150		N/A			0	0	N/A	0	0	0	0	0			N/A
JIS B2210	10K							N/A					N/A			N/A
JIS B2210	5K			0	0	0	0	N/A	0	0	0	N/A	0			N/A
AS2129	Table D							N/A			N/A		N/A		N/A	
AS4087	PN 16							N/A			N/A		N/A		N/A	
AS2129	Table E							N/A						N/A		

### NOTES

- Standard possible for all versions
- 0 Optional, contact factory
- N/A Not applicable

Data is valid for flat face flanges. For raised face, please consult factory.  
 DN 1600 is not available with ASME drilling. See above chart for drilling details.  
 See installation, operations and maintenance manual (IOM) for detailed bolting information.



# KEYSTONE SERIES GRF RESILIENT SEATED BUTTERFLY VALVES

## IMPERIAL TABLES

### FLOWRATE CO-EFFICIENTS - C<sub>v</sub> VALUES

Size (NPS)	Disc opening (degrees)								
	10°	20°	30°	40°	50°	60°	70°	80°	90°
24	403	1034	2163	3881	6577	10566	17021	30471	35356
28	549	1406	2945	5282	8953	14382	23168	41474	48123
30	630	1614	3380	6064	10277	16510	26595	47610	55243
32	717	1837	3846	6899	11692	18784	30259	54170	62854
36	908	2325	4868	8732	14799	23773	38297	68558	79550
40	1120	2871	6008	10780	18269	29351	47280	84640	98212
42	1235	3164	6626	11885	20143	31973	57815	99203	110823
44	1355	3473	7272	13044	22107	35090	63452	108876	121629
48	1613	4133	8654	15523	26309	41760	75514	129571	144749
54	2041	5231	10953	19647	33297	52853	95572	163989	183198
56	2195	5625	11780	21129	35809	56840	102782	176361	197019
60	2520	6458	13523	24255	41108	65250	117990	202455	226170
64	2867	7347	15386	27597	46771	74240	134246	230349	257331
66	3049	7814	16362	29349	49740	78953	142768	244971	273666
72	3629	9299	19472	34927	59195	93960	169906	291535	325685

### NOTE

C<sub>v</sub> = The volume of water in U.S.gpm that will pass through a valve with a pressure drop of 1 psi at 60°F

### PRESSURE-TEMPERATURE DIAGRAM

Seat material	Disc material	Body material	Size range (NPS)	Valve rating**	Temperature (°F)								
					-40	-20	0	32	122	212	248	266	302
EPDM	All metal	DI A536 65-45-12/ CS A216 WCB/ SS A351 CF8M	24-72	Std / EOL				150 psi / 90 psi					
EPDM	All metal	DI A395 60-40-18	24-72	Std / EOL				150 psi / 90 psi					
NBR/NBR white	All metal	DI A536 65-45-12/ A395 60-40-18/ CS A216 WCB/ SS A351 CF8M	24-72	Std / EOL				150 psi / 90 psi					
FKM	All metal	DI A536 65-45-12/ A395 60-40-18/ CS A216 WCB/ SS A351 CF8M	24-40	Std / EOL				150 psi / 90 psi				90 psi / 60 psi	

\*\* Standard / End of line

### TEMPERATURE PERFORMANCE COATED DISC

Disc material	Coating	Size range (NPS)	°F
DI A536 65-45-12 / A395 60-40-18	DI epoxy coated	24-72	-20 to 250 / -40 to 250
DI A536 65-45-12 / A395 60-40-18	DI nylon coated	24-72	-20 to 140 / -40 to 140
DI A536 65-45-12 / A395 60-40-18	DI FBE coated	24-72	-20 to 125 / -40 to 125
DI A536 65-45-12 / A395 60-40-18	DI ebonite coated	24-72	-20 to 212 / -40 to 212

### POSSIBLE FLANGE DRILLINGS

Flange drilling		Valve size (NPS)														
		24	28	30	32	36	40	42	44	48	54	56	60	64	66	72
EN 1092	PN 10			N/A				N/A			N/A		N/A		N/A	
ISO 2084	PN 10							N/A			N/A				N/A	
ASME B16.5	Class 150	See B16.47A														
ASME B16.1	Class 125		N/A		N/A		N/A		N/A			N/A		N/A		
ASME B16.47A	Class 150	See B16.5													N/A	
AWWA C207	Table B/D/E											N/A		N/A		
MSS SP44	Class 150															N/A
ASME B16.47B	Class 150		N/A			0	0	N/A	0	0	0	0	0			N/A
JIS B2210	10K							N/A				N/A				N/A
JIS B2210	5K			0	0	0	0	N/A	0	0	0	N/A	0			N/A
AS2129	Table D							N/A			N/A		N/A			N/A
AS4087	PN 16							N/A			N/A		N/A			N/A
AS2129	Table E							N/A							N/A	

### NOTES

- Standard possible for all versions
- 0 Optional, contact factory
- N/A Not applicable

Data is valid for flat face flanges. For raised face, please consult factory.  
 NPS 64 is not available with ASME drilling. See above chart for drilling details.  
 See installation, operations and maintenance manual (IOM) for detailed bolting information.

# KEYSTONE SERIES GRF RESILIENT SEATED BUTTERFLY VALVES

## SELECTION GUIDE

Example:	GRF	0900	- D0	S1	S2	E0	A1	K	- 00	000	00
<b>Body style</b>											
<b>GRF</b> Double flanged											
<b>Size DN (NPS)</b>											
<b>0600</b> 600 (24)		<b>1100</b> 1100 (44)					<b>1800</b> 1800 (72)				
<b>0700</b> 700 (28)		<b>1200</b> 1200 (48)					<b>1400</b> 1400 (56)				
<b>0750</b> 750 (30)		<b>1350</b> 1350 (54)					<b>1500</b> 1500 (60)				
<b>0800</b> 800 (32)		<b>1400</b> 1400 (56)					<b>1600</b> 1600 (64)				
<b>0900</b> 900 (36)		<b>1500</b> 1500 (60)					<b>1650</b> 1650 (66)				
<b>1000</b> 1000 (40)		<b>1600</b> 1600 (64)					<b>1800</b> 1800 (72)				
<b>1050</b> 1050 (42)		<b>1650</b> 1650 (66)									
<b>Body</b>											
<b>D0</b> Ductile iron A536											
<b>D3</b> Ductile iron A395 (previously D2)											
<b>C0</b> Carbon steel A216											
<b>S0</b> Stainless steel A351											
<b>Disc</b>											
<b>D1</b> Ductile iron - epoxy						<b>S1</b> 304 Stainless steel					
<b>D2</b> Ductile iron - nylon						<b>A1</b> Aluminum bronze					
<b>D3</b> Ductile iron - FBE <sup>[3]</sup>						<b>N0</b> Nickel aluminum bronze					
<b>D7</b> Ductile iron - Ebonite						<b>U0</b> Duplex					
<b>S0</b> 316 Stainless steel						<b>V0</b> Super duplex					
<b>Shaft</b>											
<b>S2</b> 431 Stainless steel											
<b>U0</b> Duplex											
<b>V0</b> Super duplex											
<b>M1</b> Monel® K500											
<b>Seat</b>											
<b>E0</b> EPDM											
<b>N0</b> NBR											
<b>F1</b> Fluorelastomer (FKM) <sup>[1]</sup>											
<b>Flange drilling</b>											
<b>A1</b> ASME 125/150						<b>J1</b> JIS B2210 - 10K					
<b>A5</b> AWWA C207						<b>P1</b> ISO7005 - PN 6					
<b>AE</b> AS2129 table E						<b>P2</b> ISO7005 - PN 10					
<b>AD</b> AS 4087 PN 16/AS2129 table D											
<b>Actuator mounting<sup>[2]</sup></b>											
<b>K</b> Keystone mount											
<b>I</b> ISO mount (above NPS 40)											
<b>Actuation</b>											
<b>00</b> None											
<b>G1</b> Gear - blue											
<b>G5</b> Chainwheel - blue											
<b>Special</b>											
<b>000</b> None											
<b>P04</b> Reduced disc for 50 psi											
<b>027</b> Vacuum holes and fittings											
<b>Coating</b>											
<b>00</b> Standard blue											
<b>02</b> C3 Keystone blue											
<b>03</b> C5M Keystone blue											
<b>04</b> FBE coated body - blue											

## NOTES

1. Fluorelastomer (FKM) available in size up to DN 1000 (NPS 40) only.
2. Valves in size DN 600-900 (NPS 24-36) are Keystone topplate mounting.  
Valves in size DN 1000-1800 (NPS 40-72) are ISO 5211 topplate mounting.
3. FBE = Fusion bond epoxy

Other options are available on request. Please contact your local sales representative.

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## KEYSTONE SERIES GRF RESILIENT SEATED BUTTERFLY VALVES

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