

KEYSTONE FIGURE 9 BUTTERFLY VALVE

THIS PRODUCT IS NOW DISCONTINUED (EFFECTIVE OCTOBER 2021)

A resilient seated butterfly valve for general purpose applications



FEATURES

- Bubble-tight shut-off at full pressure rating (PTFE lined configuration is drop tight).
- The seat and the disc are the only two valve parts in contact with the medium.
- Superior design for abrasive and erosive media.
- Famous Keystone dovetail seat design.
- Very low pressure drop.
- Large number of material combinations available.
- Standardized actuator flange for easy operator interchangeability.
- Top bushing absorbs side thrust loads.
- Hub seal provided by preloaded contact between flatted seat surface and disc hub area for positive sealing at all disc positions.
- One-piece wafer thin disc stem gives the very minimum obstruction to flow.
- Field replaceable seat isolates the body and stem from the flow.
- Molded-in O-rings provides flange sealing and eliminates need for gaskets.

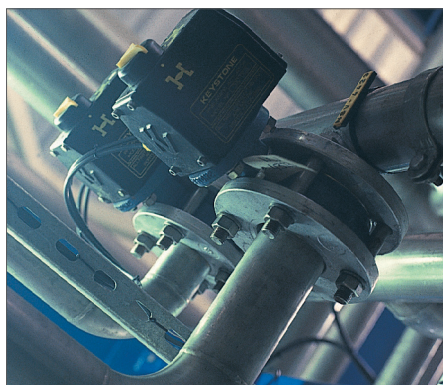
GENERAL APPLICATION

The ideal valve for dry bulk conveying, food and beverage processing, corrosive slurries and paperstock.

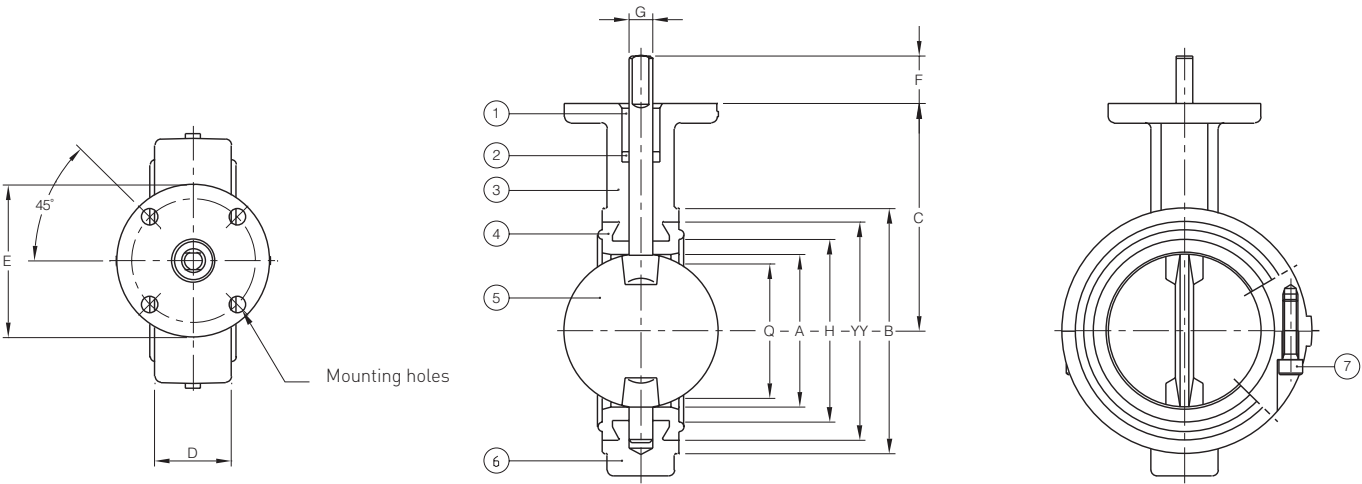
TECHNICAL DATA

Pressure (bar):	10*
Temperature (°C):	-40 + 150
Sizes (DN):	25-500
Flange acc.:	PN 10
	ANSI 150
	Other flanges on request

* For mirror polished/satin finished disc the max. differential pressure is 6 bar for sizes DN 150-300.



KEYSTONE FIGURE 9 BUTTERFLY VALVE



VALVE DIMENSIONS (mm)

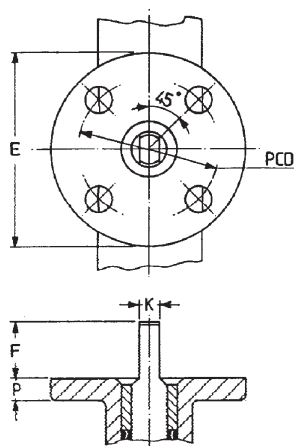
Size	A	B	C	D	E	F	G	H	YY	Q	Mass (kg)
25	31	62	79	29	57	19	9.53	37	50	15	0.7
40	45	82	94	30	57	19	9.53	55	67	35	1.1
50	51	109	108	41	102	32	14.28	68	87	33	3.0
65	64	129	122	45	102	32	14.28	81	98	48	3.5
80	76	144	132	45	102	32	14.28	94	114	64	4.0
100	102	164	152	51	102	32	15.88	122	146	90	5.5
125	127	194	152	54	102	32	19.05	149	168	117	7.2
150	146	220	173	54	102	32	19.05	176	197	138	8.5
200	197	275	211	64	152	32	22.20	233	254	189	15.0
250	248	330	229	64	152	51	28.58	284	305	241	20.5
300	298	377	308	76	152	51	28.58	338	353	291	31.0
350	337	429	305	76	152	51	28.58	370	403	330	40.0
400	387	489	329	102	152	51	41.28	429	464	376	56.0
450	438	546	368	108	203	57	47.63	468	521	427	92.0
500	489	600	403	127	203	57	47.63	535	575	475	112.0

Part	Name
1.	Bushing
2.	Shaft seal
3.	Upper body
4.	Seat
5.	Disc-stem
6.	Lower body
7.	Body screws

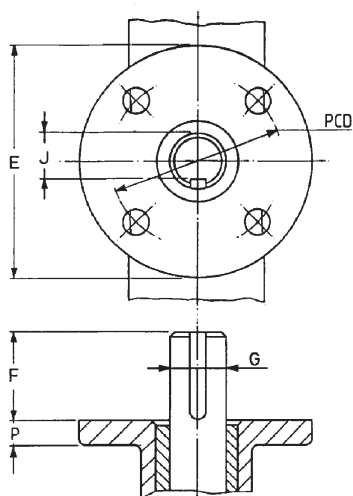
NOTES

- 1. Valve size shown is the DN 100; other sizes show different configurations.
For information see separate data sheets.
- 2. Q is the disc chordal dimension at face of valve for disc clearance into pipe fitting or equipment.

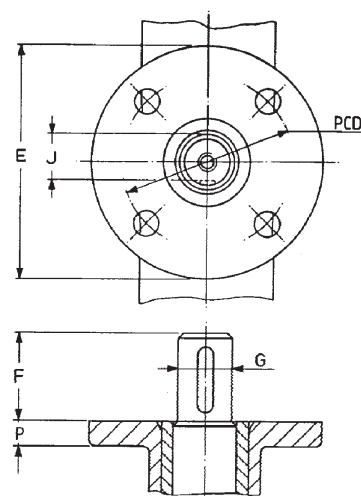
KEYSTONE FIGURE 9 BUTTERFLY VALVE



DN 25-200



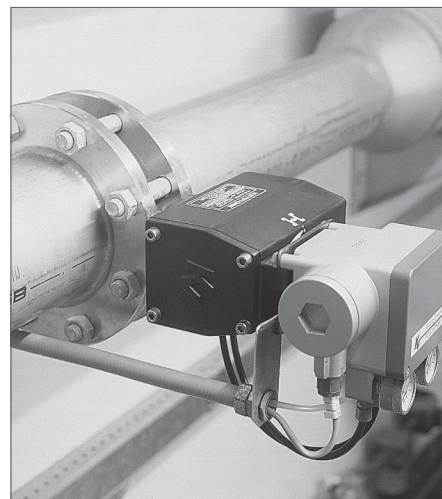
DN 250-300 / DN 400-450



DN 350 / DN 500

ACTUATOR FLANGE DIMENSIONS (mm)

Size	Shaft dimensions					Actuator flange dimensions				
	F	G	K	J	Keysize width x height	E	P	PCD	Hole ø	No. of holes
25	19	9.53	6.35	-	-	57	8	44.5	7	4
40	19	9.53	6.35	-	-	57	8	44.5	7	4
50	32	14.28	9.50	-	-	102	13	82.6	11	4
65	32	14.28	9.50	-	-	102	13	82.6	11	4
80	32	14.28	9.50	-	-	102	13	82.6	11	4
100	32	15.88	11.10	-	-	102	13	82.6	11	4
125	32	19.05	12.70	-	-	102	13	82.6	11	4
150	32	19.05	12.70	-	-	102	13	82.6	11	4
200	32	22.20	15.88	-	-	152	16	127.0	14	4
250	51	28.58	-	25.04	6.35 x 6.35	152	16	127.0	14	4
300	51	28.58	-	25.04	6.35 x 6.35	152	16	127.0	14	4
350	51	28.58	-	25.04	6.35 x 6.35	152	16	127.0	14	4
400	51	41.28	-	35.60	12.70 x 9.53	152	16	127.0	14	4
450	57	47.63	-	42.01	12.70 x 9.53	203	19	165.1	21	4
500	57	47.63	-	42.01	12.70 x 9.53	203	19	165.1	21	4



KEYSTONE FIGURE 9 BUTTERFLY VALVE

VALVE DATA

K_v VALUES

Disc opening	Size in mm														
	25	40	50	65	80	100	125	150	200	250	300	350	400	450	500
10°	0.4	0.9	1.7	2.6	3.4	5	9	15	21	33	49	65	86	110	130
20°	1.7	4.3	7.0	10.0	14.0	25	38	52	95	155	220	290	380	490	610
30°	4.3	9.5	16.0	22.0	33.0	54	86	120	220	340	510	660	860	1120	1380
40°	6.9	16.0	26.0	38.0	57.0	95	160	220	380	610	860	1200	1550	1980	2490
50°	11.0	26.0	43.0	60.0	95.0	150	240	340	590	950	1460	1890	2410	3100	3960
60°	17.0	40.0	69.0	95.0	150.0	240	390	550	950	1550	2320	2920	3870	4990	6190
70°	29.0	66.0	110.0	160.0	240.0	400	640	950	1550	2580	3780	4820	6360	8260	10300
80°	46.0	103.0	170.0	250.0	370.0	620	950	1380	2410	3960	5850	7740	9460	12900	15500
90°	52.0	120.0	320.0	430.0	590.0	960	1510	2000	3550	5800	8460	8600	11200	15500	18900
90°*	52.0	120.0	320.0	430.0	590.0	960	1510	2000	3550	5800	8460	9460	12000	15500	18900

NOTE

* Rubber covered disc

1. Rated K_v = the volume of water in m³/hr that will pass through a given valve opening at a pressure drop of 1 bar.

MAXIMUM ALLOWABLE SHAFT TORQUES (Nm)

Shaft mat.	Size in mm														
	25	40	50	65	80	100	125	150	200	250	300	350	400	450	500
1.4408	16	16 ^[1]	54	54	54	80	128	128 ^[2]	226 ^[2]	715	642 ^[3]	-	-	-	-
1.4470	-	-	-	-	-	-	257	453	1486	-	-	-	-	-	-
1.4301*	-	-	-	-	-	-	-	-	-	-	821 ^[1]	1853	2162	2525	

NOTES

* For mirror polished/satin finish disc, contact factory.

1. For application III 10 bar contact factory.
2. For application III 6 bar contact factory.
3. For application II and III 10 bar contact factory.
(MAST 10 bar = 480 Nm)

SIZING TORQUES (Nm)

ΔP in bar	Size in mm														
	25	40	50	65	80	100	125	150	200	250	300	350	400	450	500
I*															
3.5	6	10	20	35	30	45	62	89	150	230	330	460	610	800	1200
7	7	11	21	26	32	48	68	100	180	270	380	560	750	1010	1310
10	8	12	23	27	35	52	74	110	200	300	440	650	890	1220	1600
II*															
3.5	8	12	27	32	39	59	81	120	200	300	420	590	770	1000	1270
7	9	13	28	33	42	62	87	130	220	330	470	680	910	1210	1560
10	10	14	29	35	44	66	92	140	240	370	530	770	1050	1420	1850
III*															
3.5	10	14	32	38	47	71	97	144	240	360	504	708	924	1200	1524
7	11	16	34	40	50	74	104	156	264	396	564	816	1092	1452	1872
10	12	17	36	42	53	79	110	168	288	444	636	924	1260	1704	2220

* Application I, II, III

NOTES

1. **Application I**
Water, seawater, lubricating types of hydrocarbons. Temp.: 0-80°C;
Valve opens at least once a month.
Application II
All other liquid applications and lubricating gasses.
Application III
Non lubricating and dry media.
2. The charted maximum sizing operating torque is the sum of all friction and resistance for opening and closing of the disc against the indicated pressure differential.
3. The effect of dynamic torque is not considered in tabulation.
4. In sizing operators it is not necessary to include safety-factors.

DYNAMIC TORQUE FACTORS F_T FOR METRIC UNITS

Disc opening	Size in mm														
	25	40	50	65	80	100	125	150	200	250	300	350	400	450	500
10°	0.08	0.2	0.5	0.9	1.2	2.7	4.3	6.1	13	28	39	64	82	128	150
20°	0.10	0.2	0.7	1.0	1.5	3.4	5.9	8.7	20	40	61	97	133	200	250
30°	0.11	0.3	0.8	1.3	2.1	4.8	8.4	13.0	30	61	95	154	220	320	420
40°	0.15	0.5	1.0	1.5	3.0	6.4	12.0	20.0	47	94	153	240	360	510	680
50°	0.20	0.7	1.5	2.6	4.3	10.0	19.0	30.0	71	141	230	370	550	790	1060
60°	0.25	0.8	2.1	3.9	6.4	15.0	29.0	48.0	112	220	380	600	880	1270	1720
70°	0.41	1.3	3.1	5.9	10.0	24.0	45.0	76.0	176	350	610	960	1420	2090	2770
80°	0.57	1.8	4.4	8.5	14.0	34.0	65.0	112.0	260	520	890	1400	2040	3070	4080

NOTES

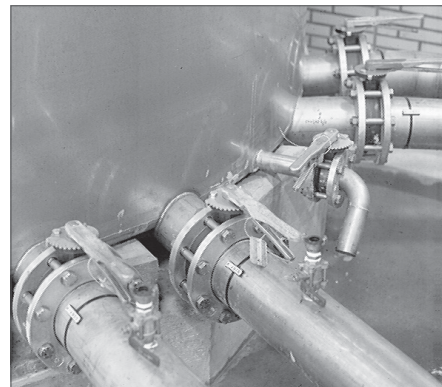
1. Dynamic operating torque formula:
T_D = **F_T x ΔP**
T_D = Dynamic torque (Nm)
ΔP = Pressure drop across disc at desired disc-opening (bar)
F_T = Dynamic torque factor (see table)
2. The dynamic torque includes all frictional resistances.
3. The dynamic torque is tending to close the disc.
4. The charted maximum allowable torques are only applicable for standard type valves.

KEYSTONE FIGURE 9 BUTTERFLY VALVE

VALVE DATA AND MATERIAL SELECTION

ACTUATOR SELECTION

Actuator type	Figure	Remark
Handle	F401	Leverlock
	F410	Composite
Gear	F422	-



Body	Disc	Shaft	Seat	Trim no.	Sizes (mm)
Cast iron	Stainless steel	Stainless steel	EPDM	102	25-500
			NBR	106	25-500
			White NBR	169	25-500
			PTFE/EPDM	186	50-300
Cast iron	Stainless steel (satin finished)	Stainless steel	EPDM	104	25-300
			NBR	107	25-300
			White NBR	185	25-300
			PTFE/EPDM	187	50-300
Cast iron	Stainless steel (mirror polished)	Stainless steel	EPDM	239	50-300
			NBR	240	50-300
			White NBR	241	50-300
			PTFE/EPDM	585	50-300
Cast iron	EPDM covered	Stainless steel	EPDM	103	50-300
Cast iron	PTFE covered	Stainless steel	PTFE/EPDM	188	50-300
Cast iron	Titanium	Titanium	EPDM	253	50-300
			NBR	254	50-300
			PTFE/EPDM	256	50-300

PRESSURE - TEMPERATURE DIAGRAM

Seat material	Disc material	Body material	Size range DN (mm)	Valve function Wafer/end of line	Temperature in °C											Notes
					-40	-30	-20	-15	0	50	100	120	130	150	160	
EPDM	all except:	all	all	W												1
	SS (MP/SF)	all	150-300	W												2
NBR and White NBR	all except:	all	all	W												4
	SS (MP/SF)	all	150-300	W												5
PTFE/EPDM	all except:	all	all	W												6
	SS (MP/SF)	all	150-300	W												7

PRESSURE - TEMPERATURE DIAGRAM

Note	Trims					
1	102	103	104	239		
2	104	239				
4	106	107	169	185	240	241
5	107	185	240	241		
6	186	187	188			
7	187					

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