FRESNO

Series 8500 Grayline Butterfly Valves

Features

Grayline®
BUTTERFLY VALVES

- **State-of-the-Art Manufacturing:** Valves are produced using state-of-the-art manufacturing equipment. Each valve is tested to 110% of rated working pressure to ensure quality.
- **Advanced Seating Profile on Disc:** Three radius seating profile reduces operating torque while providing bubble-tight and positive shut-off. The disc seating surface is precision machined and polished for low operating torque and longer seating life.
- **Multiple Stem Seals:** The primary stem seal is achieved between the disc and the seat. Secondary seals are incorporated into both the upper and lower stem to back up the primary stem seal.
- **Maintenance-Free Stem Bushing:** Graphite polymer bushings are self-lubricating and require no maintenance. The bushings provide low friction stem support for easy operation and long service life. Upper stem bushing prevents foreign matter from entering the valve.
- **Phenolic Backed Cartridge Seat:** Non-collapsible phenolic backed cartridge seat provides superior sealing integrity. The rigid backing ring eliminates high torque and premature failure caused by elastomer distortion found in butterfly valves with non-rigid seat designs.
- **Multiple Seals on Seat:** Integral flange seals molded into the edge of the seat require no flange gaskets.
- **Secured and Precision Connection Between Disc and Stem:** Secured and precision connection on stem-disc joint provides maximum strength of disc/stem connection and minimizes unwanted free travel.
- **Investment Cast Disc (2”-12”):** Uniform and smooth surface finish. Streamlined for maximum flow and minimum seat wear.
- **Heat Treated Stem:** Stem material is heat treated 400 series stainless material that provides additional tensile strength.
- **Lockable Lever Handle:** The ten-position lever handle is lockable to provide tamper-proof flow control. Locking mechanism accommodates standard padlocks.

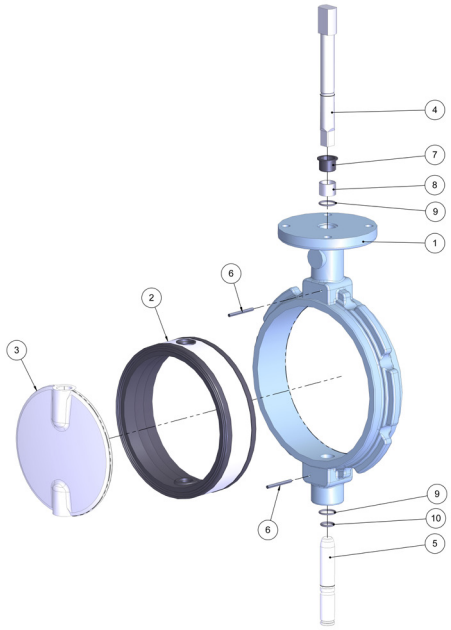
Applications

The Series 8500 Butterfly Valves can be used in a wide range of agricultural, as well as industrial applications. They are a wafer style valve and mount between standard ANSI 125#/150# flanges. The butterfly valve can be used as a shut off valve, and in throttling applications. With features like epoxy coated bodies, nylon bearing, and Buna-N liner; this valve ensures long-lasting, reliable use.

SPECIFICATIONS

Material Specifications

Item	Component	Material	ASTM Spec
1	Body	Cast Iron	ASTM A126 CLASS B
2	Seat	Buna-N	ASTM D2000
3	Disc 2" - 24"	Stainless Steel	ASTM A351, CF8
	Disc 30" - 36"	D/I, Nickel Plated	ASTM A536 Gr 65-45-12
4	Stem	Stainless Steel	ASTM A276, S420
5	Stem	Stainless Steel	ASTM A276, S420
6	Spring Pin	Stainless Steel	ASTM A276 321
7	Top Bearing	Nylon	
8	Bottom Bearing	Nylon	
9	O-Ring	Buna-N	ASTM D2000
10	O-Ring	Buna-N	ASTM D2000



Installation

The Series 8500 Butterfly Valve is designed for installation between ANSI 125#/150# flanges. During installation, flanges should be spaced to allow the valve to glide easily between the flanges. The locating lugs should be utilized to ensure accurate centering of the valve between the flanges. The bolts should be evenly tightened to ensure a proper seal compression.

Pressure Rating

Break away torque is the effort required to open the valve at a given pressure differential. This is the highest required torque value to operate the valve and is used to size any actuator.

Break Away Torque Values in Inch-Pounds for Wet Service

Valve Size	Pressure Differential (psi)			
	25	100	150	200
2	102	113	120	125
2.5	157	176	182	192
3	210	237	244	256
4	232	264	285	350
5	349	405	440	478
6	496	595	655	705
8	1020	1265	1408	1571
10	1596	2075	2394	2697
12	2665	3465	4077	4531
14	3540	4531	5133	—
16	4993	6641	7740	—
18	6425	8545	10080	—
20	8938	12245	14568	—
24	12030	16240	19248	—
30	20850	32885	40115	—
36	28301	44690	54478	—

The torques shown in this chart were derived from test data using water at 60°F (wet condition). For torques using dry gases (dry condition), user should contact Fresno Valves & Castings, Inc.
There is no safety factor included in the numbers shown on this chart. For actuator sizing, Fresno Valves & Castings, Inc. recommends that these values be multiplied by 1.5 for single valve applications, 2.0 for 3-way (tee) applications.

Rated Pressure:

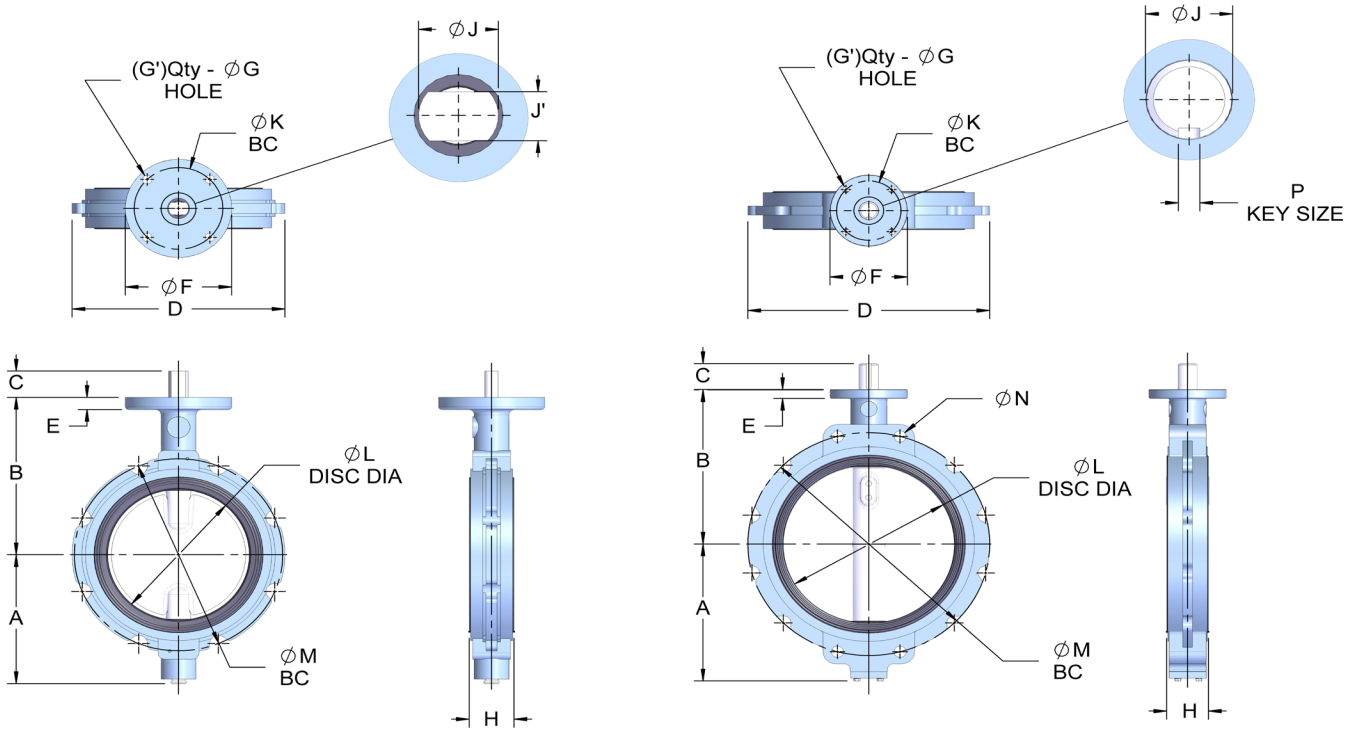
- 200 PSI for 2” through 12” valves.
- 150 PSI for 14” through 36” valves.

SPECIFICATIONS

Options

- Available in sizes 2” through 36”.
- Lever operated valves available through 12” valves.
- Gear operated available on all valve sizes.
- 2” operating nuts available.
- Buried service gear boxes available through 12” valves.
- Locking devices available.
- Extensions in stock from 24” to 72” (custom extensions available upon request).
- Electric & pneumatic operators available through 12” valves.

Dimensional Information

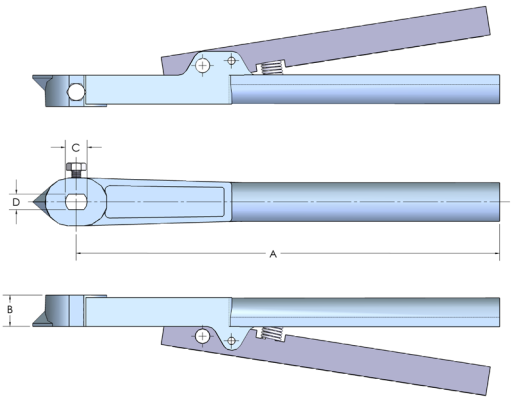


SIZE	A	B	C	D	E	F	G'	G	H	J	J'	K	L	M	N	P
2	3.12	5.80	1.06	5.13	0.49	4.00	4	0.41	1.65	0.56	0.44	3.00	2.21	4.75	-----	-----
2.5	3.28	6.30	1.06	5.85	0.49	4.00	4	0.41	1.79	0.56	0.44	3.00	2.67	5.50	-----	-----
3	3.63	6.50	1.06	6.25	0.49	4.00	4	0.41	1.79	0.56	0.44	3.00	3.17	6.00	-----	-----
4	4.60	7.25	1.06	7.80	0.49	4.00	4	0.41	2.03	0.63	0.44	3.00	4.18	7.50	-----	-----
5	5.62	7.75	1.06	8.80	0.49	4.00	4	0.41	2.15	0.88	0.44	3.00	5.16	8.50	-----	-----
6	6.38	8.40	1.06	9.80	0.49	4.00	4	0.41	2.15	1.00	0.44	3.00	6.04	9.50	-----	-----
8	7.89	9.63	1.63	12.00	0.75	6.00	4	0.53	2.37	1.13	0.75	5.00	8.06	11.75	-----	-----
10	9.34	11.00	1.63	14.50	0.75	6.00	4	0.53	2.65	1.13	0.75	5.00	10.06	14.25	Ø1 THRU	-----
12	10.77	12.50	1.63	17.44	0.75	6.00	4	0.53	3.03	1.13	0.75	5.00	12.07	17.00	Ø1 THRU	-----
14	11.69	13.07	2.19	18.75	0.75	6.00	4	0.53	3.06	1.50	-----	5.00	13.33	18.75	Ø1.00 - 8UNC-2B	3/8 SQ
16	12.75	14.87	2.30	21.25	0.75	6.00	4	0.53	4.00	1.50	-----	5.00	15.35	21.25	Ø1.00 - 8UNC-2B	3/8 SQ
18	13.72	15.75	3.00	22.75	0.75	6.75	4	0.53	4.50	1.75	-----	5.00	17.34	22.75	Ø1-1/8 - 7UNC-2B	3/8 SQ
20	15.35	16.75	3.00	25.00	0.88	7.75	4	0.81	5.00	1.85	-----	6.25	19.33	25.00	Ø1-1/8 - 7UNC-2B	1/2 SQ
24	17.55	19.38	3.00	29.50	0.88	7.75	4	0.81	6.06	1.85	-----	6.25	23.35	29.50	Ø1-1/4 - 7UNC-2B	1/2 SQ
30	21.90	25.51	2.60	34.53	1.18	11.81	8	0.71	6.57	2.49	-----	10.00	29.27	36.00	Ø1-1/4 - 7UNC-2B	5/8 SQ
36	26.50	28.35	4.65	41.14	1.65	11.81	8	0.71	7.99	2.95	-----	10.00	34.00	42.75	Ø1-1/2 - 6UNC-2B	1 SQ

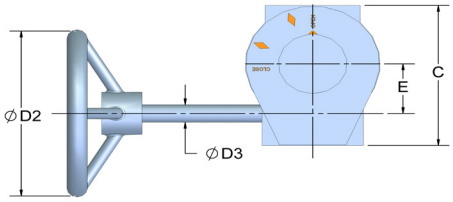
SPECIFICATIONS

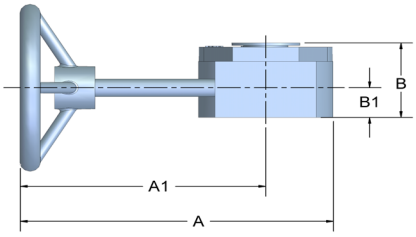
Lever Dimensions

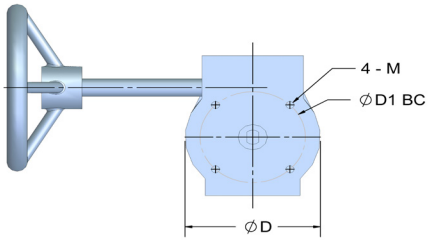
Valve Size	A	B	C	D
2-3	9.0	0.813	0.563	0.438
4	11.0	0.813	0.625	0.438
5	11.0	0.813	0.875	0.438
6	11.0	0.813	1.000	0.438
8-12	15.0	1.125	1.125	0.750



Gear Box Dimensions (in) – Valve Sizes 2” through 18”

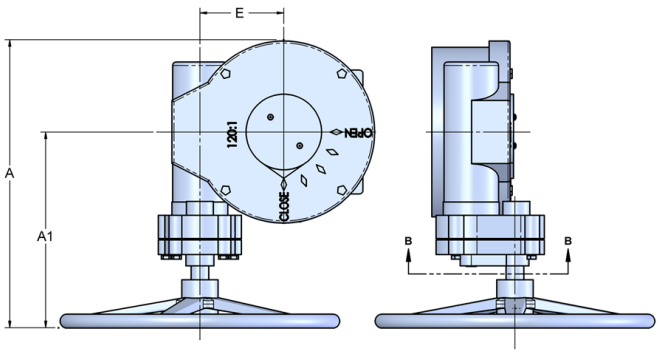


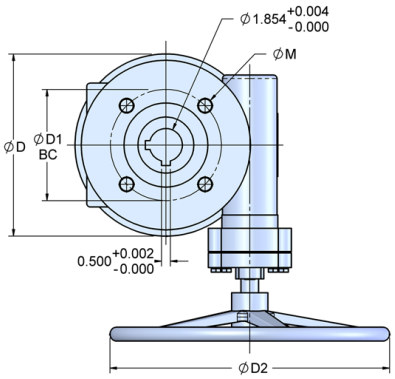


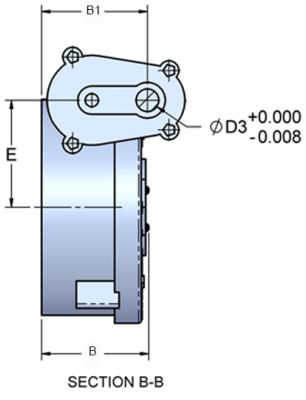


Valve Size	A	A1	B	B1	C	D	D1	D2	D3	E	M	Gear Ratio	Weight
2 - 6	9.65	7.57	2.68	1.42	4.92	4.17	3.00	5.98	0.62	1.77	3/8-16UNC-2B	24:1	11
8 - 12	12.60	9.55	3.15	1.34	7.00	6.10	5.00	11.89	0.75	2.60	1/2-13UNC-2B	30:1	24
14	16.14	12.80	3.43	1.52	7.87	6.69	5.00	11.89	0.75	3.00	1/2-13UNC-2B	50:1	31
16	16.44	11.32	4.72	2.22	11.42	10.24	5.00	11.89	1.00	4.72	1/2-13UNC-2B	80:1	60
18	16.44	11.32	4.72	2.22	11.42	10.24	5.00	11.89	1.00	4.72	1/2-13UNC-2B	80:1	60

Gear Box Dimensions (in) – Valve Sizes 20” through 24”



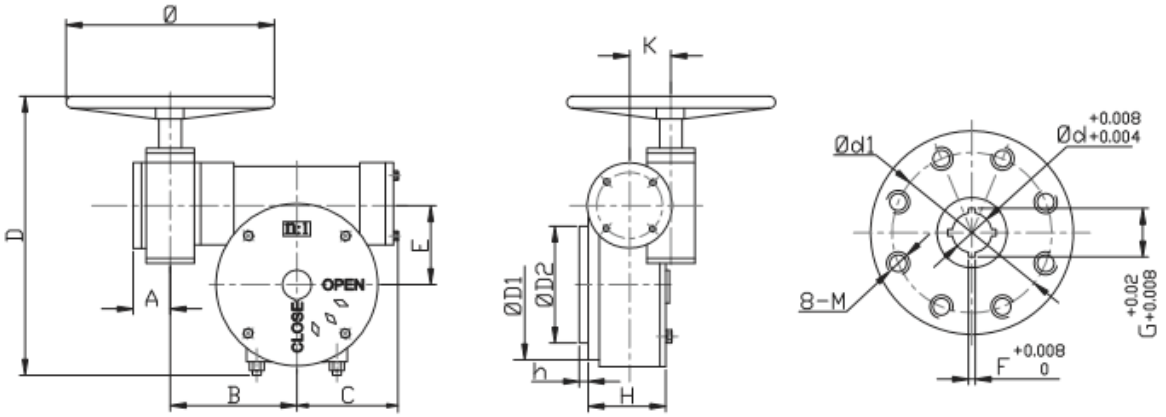




Valve Size	A	A1	B	B1	D	D1	D2	E	M	Gear Ratio	Weight
20-24	16.14	11.02	6.34	4.69	10.24	6.25	15.75	4.72	3/4-10UNC-2B	120:1	81

SPECIFICATIONS

Gear Box Dimensions (in) – Valve Sizes 30” through 36”



Valve Size	A	B	C	D	E	F	G	h	H	Ø	K	ØD2	ØD1	Ød	Ød1	M	Gear Ratio	Weight
30"	2.36	9.72	6.89	21.73	6.38	0.63	2.81	0.12	6.1	15.75	3.35	7.88	11.81	2.50	10	M16	704:1	298lb
36"	2.76	11	8.27	25.63	7.72	1	3.34	0.16	6.3	15.75	5.0	7.88	11.81	2.95	10	M16	640:1	419lb

Cv Value* - Valve Sizing Coefficient (Water at 60°F Sp. Gr = 1.0)

Valve Size	Disc Angle Open								
	10°	20°	30°	40°	50°	60°	70°	80°	90° Full Open
2	0	1	5	12	25	47	90	118	140
2-1/2	0	2	10	26	39	97	129	192	244
3	0	7	21	45	62	110	203	326	452
4	0	20	44	81	120	199	351	570	689
5	0	29	71	134	199	336	577	1142	1440
6	0	39	103	203	307	507	876	1427	1980
8	1	58	178	382	587	964	1640	2631	3870
10	9	83	274	605	980	1661	2678	3919	6450
12	11	106	378	904	1553	2489	4130	5432	9800
14	13	117	567	1386	2087	3074	4840	8347	14655
16	17	206	834	1953	2938	4046	6766	12671	17868
18	20	316	1129	2247	3627	5289	8459	16234	23173
20	25	474	1478	2957	4678	7745	10973	19211	29645
24	30	683	2187	4268	6165	9737	15432	28376	38879
30	37	2080	4406	9546	17010	28147	44545	66818	73426
36	60	3050	6730	12740	20220	32500	52500	79600	87500

*Cv Value is the flow rate (US gal/min) of water at 60°F passing through the valve when the disc is fully open and the differential pressure between the two ends of the valve is 1psi (lb./in²).

For optimum throttling characteristics, a butterfly valve should be sized to throttle within the range of 25° to 70° of disc opening.

Flow Calculations for Liquids

To determine the flow rate or pressure drop of liquid passing through a butterfly valve, use the following formula:

$$Q_L = C_v \times \sqrt{\frac{\Delta P}{S_L}}$$

$$\Delta P = S_L \times \left(\frac{Q_L}{C_v} \right)^2$$

Where:
Q_L = Flow of liquid in gallons per minute (GPM).
C_V = Flow coefficient from above table.
ΔP = Pressure drop across two ends of valve.
S_L = Specific Gravity of liquid (1.0 for water).

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