KEYSTONE

• 61W - Wafer style resilient seated butterfly valve
• 61L - Lugged style resilient seated butterfly valve

Features

- Rounded polished disc edge gives full concentric sealing, lower torques, longer seat life and bubble-tight shutoff.
- The seat is field replaceable and fully isolates the body and stem from the flow.
- Primary stem sealing exceeds the pressure rating of the valve and prevents leakage through stem area to atmosphere.
- A secondary stem seal provides backup sealing.
- Top and bottom inboard stem bearings for optimum support and minimum friction to prolong valve life.
- Top bushing absorbs actuator side thrust loads.
- Top seal helps prevent moisture penetrating into the stem area.
- Thin disc design provides minimum obstruction to flow, resulting in smooth flow characteristics.
- A molded-in O-ring in the seat for flange sealing eliminates the need for gaskets.
- Extended body neck allows for pipe insulation.
- Body locating holes ease installation and centering between the flanges.
- Available approvals: PED (CE Mark), DNV, Lloyds.

General Applications

Suited to many applications where tight shut-off is required, such as:

- Industrial Processing
- Water and Wastewater
- Dry Bulk Conveying
- Paper Mills
- Light Slurry Handling
- Food and Beverage
- HVAC
- Transportation

Technical Data

Size Range:	2" to 12"
Pressure:	235 psi
End of line:	150 psi
Temperature:	-40°F to +300°F
End Connection:	ASME 125/150

tyco Flow Control

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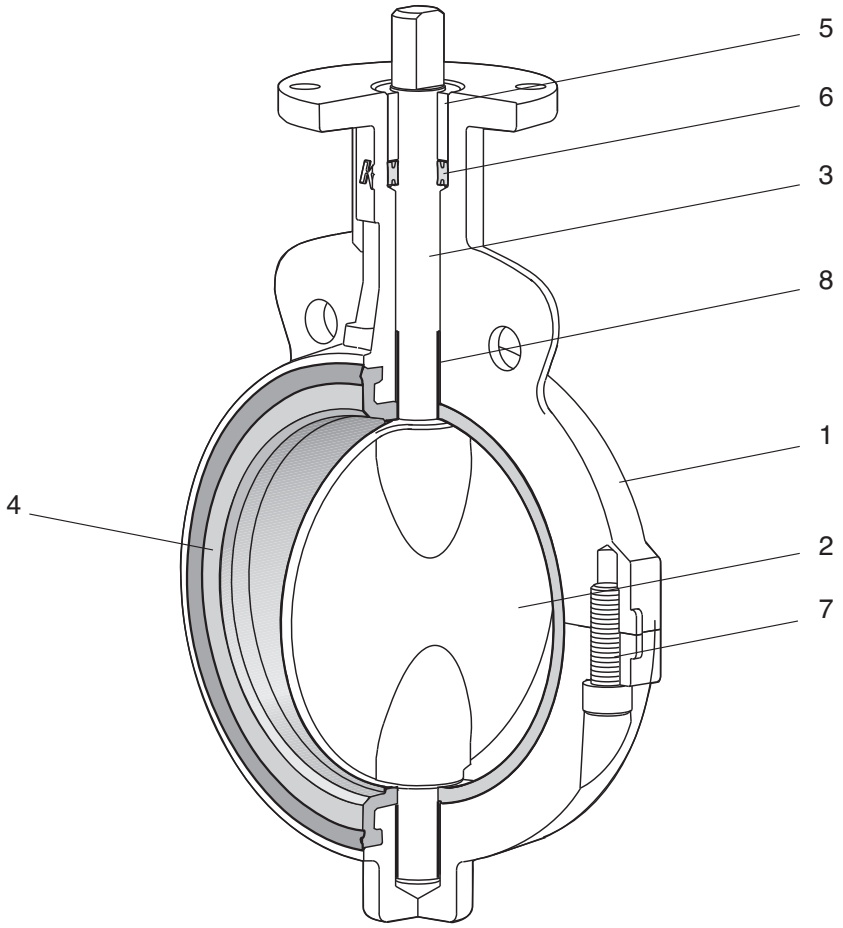
Specifications



Temperature Rating

-40°F to +250°F with EPDM

+5°F to +212°F with NBR

Notes

PED approved valves have a temperature limitation of -20°F due to body material.

Consult your sales representative for available trims.

Parts List

No.	Description	Standard Material	Material Specification
1	Body	Ductile Iron	ASTM A536 Gr 65-45-12
2	Disc	Super Duplex SAF 2507	ASTM A890 5A
		Ductile Iron (Nylon Coated)	ASTM A536 Gr 65-45-12
3	Stem	416 Stainless Steel (Standard)	ASTM A582 Gr 416 cond. H
		316 Stainless Steel (Optional)	EN10088-3 X5CrNiMo 17-12-2
		Super Duplex Stainless Steel	EN10088-3 X2CrNiMoN25-7-4
4	Seat	EPDM (Food Grade)	–
		NBR (Food Grade)	–
5	Stem Bush	Polyester	–
6	Stem Packing	NBR	–
7	Body Screws	316 Stainless Steel	–
8	Bearings	Sintered Metal	ASTM B439 Grade 1

Notes

ENP = Electroless Nickel Plated
(for corrosion resistance)

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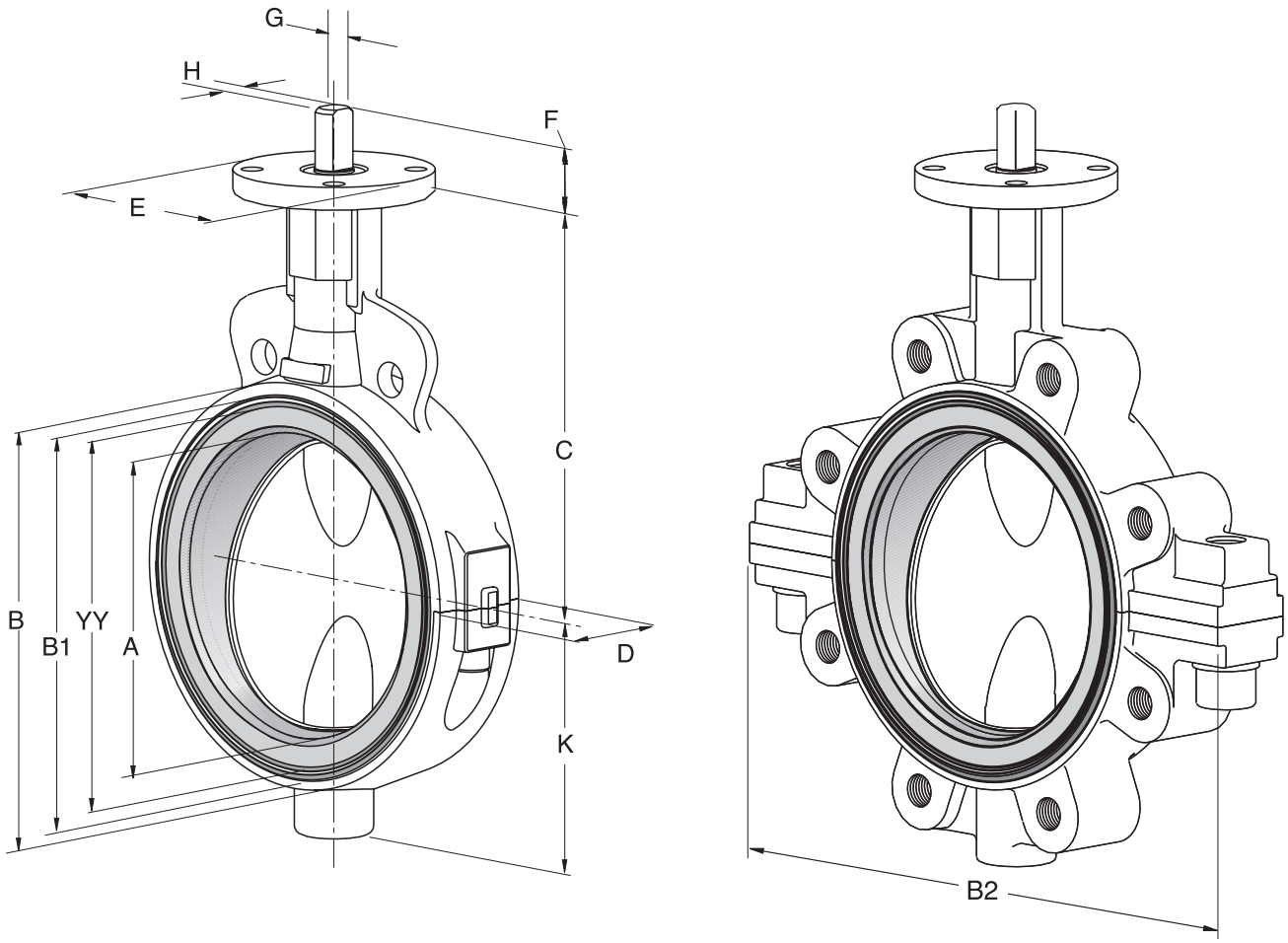
Specifications



Dimensions, inches

Valve Size in.	Stem Conn. Code	ØA	ØB	ØB1	B2	C	D	ØE	F	K	Q	ØYY	Stem Conn. H x G inches	Key in.	Top Plate Bolt Circle	Top Plate Hole Dia.	Weight lbs. Wafer	Weight lbs. Lug
2	BB	1.97	3.70	3.15	7.09	5.31	1.69	4	0.98	2.80	1.06	2.60	0.472 x 0.315		3.25	7/16	4.50	8.00
2.5	BAB	2.44	4.29	3.66	7.87	5.91	1.81	4	1.18	3.07	1.69	3.07	9/16 x 3/8		3.25	7/16	7.00	11.00
3	BAB	3.07	4.96	4.41	9.45	6.30	1.81	4	1.18	3.98	2.52	3.82	9/16 x 3/8		3.25	7/16	8.00	13.00
4	BAC	3.90	6.14	5.67	10.55	7.09	2.05	4	1.18	4.53	3.43	5.08	5/8 x 7/16		3.25	7/16	11.50	18.50
5	BAD	4.88	7.44	6.89	11.81	7.68	2.20	4	1.18	4.69	4.45	6.30	3/4 x 1/2		3.25	7/16	16.75	25.50
6	BAD	5.94	8.43	7.72	13.19	8.27	2.20	4	1.18	5.59	5.55	7.13	3/4 x 1/2		3.25	7/16	18.75	28.70
8	CAE	7.68	10.51	9.76	15.63	9.45	2.36	6	1.26	7.05	7.40	9.17	7/8 x 5/8		5.00	9/16	35.50	49.00
10	CAF	9.65	12.64	12.01	18.90	10.83	2.68	6	1.97	8.62	9.33	11.42	1 1/8	1/4 x 1/4	5.00	9/16	52.00	74.00
12	CAF	11.50	14.76	13.98	21.42	12.20	3.07	6	1.97	9.61	11.14	13.39	1 1/8	1/4 x 1/4	5.00	9/16	70.50	112.50

Notes

"Q" dimension is the disc chordal dimension at face of valve for disc clearance into lined pipe or fittings.

"H" dimension is the stem connection.

"G" dimension is across the stem flats.

"ØB1" dimension is to the outside of the seat.

"ØYY" dimension is to the O-ring seal.

Weight may vary depending on trim materials used.

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Dimensions

Anticipated Seating and Unseating Torque Values - lbs. in.

Valve Size, in	Shut Off Pressure psi, Normal Service 0	50	100	150	175	235
2	115	115	115	124	133	133
2.5	159	168	177	186	204	221
3	221	230	239	266	292	319
4	301	327	354	389	434	451
5	469	513	558	620	708	752
6	655	717	779	876	1000	1062
8	1168	1310	1451	1664	1938	2080
10	1867	2133	2398	2788	3310	3567
12	2682	3053	3425	3991	4744	5115

Notes

1. The charted seating and unseating torques are the sum of all friction and includes opening and closing of the disc against the indicated pressure differential for normal service.
2. Normal Service: Clean liquid service at temperatures between 24°F to 200°F with no internal deposition or chemical attack. Operated a minimum of once per day.
3. The relationship between values are linear, therefore you can interpolate between nominated values.
4. The effect of dynamic torque is not considered in tabulation.
5. In sizing operators, it is not necessary to include safety factors.

For conditions that vary from those noted, then apply the following Application Factor Multipliers:

Operated less than once per day	x 1.2
Dry Service with gas or air	x 1.5
Dry Service with abrasives, cement	x 1.7
Lubrication oils	x 0.5
Temperature - lower than 24°F	x 1.2
- higher than 200°F	x 1.2

Chemical attack: Consult your sales representative

To apply the as noted Application Factor Multipliers:

1. Find the base torque value by selecting the required valve size from the left hand column and read across to the intended line pressure column. Note the torque value. (You can interpolate between line pressure values.)
2. Find the zero pressure torque for the same valve on the same row and subtract this zero pressure torque from the value in step 1.
3. Multiply the zero pressure torque value by the expected Application Factors.
4. Add the difference between the zero pressure torque and the line pressure torque (value of step 2 plus value of step 3) to give the new torque value specific to the actual service conditions.

Example:

A 6" Series 61 valve is to be used in a clean water application. The line pressure is 235 psi @ 210ºF. The valve may only cycle twice per month.

1. Using the Normal Service Torque Values table base torque value for **6" @ 235 psi = 1062 lbs. in.**
2. Find torque value at zero psi = **655 lbs. in.**

   Subtract **1062 - 655 = 407 lbs. in.**
3. Multiply zero pressure torque value by Application Factors

   Application Factors:

   Operated less than once per day = x 1.2

   Temperature higher than 200°F = x 1.2

   Multiply Application Factors 1.2 x 1.2 = 1.44 (round off to 1.4) **655 x 1.4 = 917 lbs. in.**
4. Add the difference between zero pressure and line pressure, as per step 2, to the value determined in step 3: **407 + 917 = 1324 lbs. in.**

The new torque value for this valve, specific to the actual service conditions, is 1324 lbs. in.

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Specifications

Notes

1. The charted seating and unseating torques are the sum of all friction and includes opening and closing of the disc against the indicated pressure differential for normal service.
2. Normal Service: Clean liquid service at temperatures between 24°F to 200°F with no internal deposition or chemical attack. Operated a minimum of once per day.
3. The relationship between values are linear, therefore you can interpolate between nominated values.
4. The effect of dynamic torque is not considered in tabulation.
5. In sizing operators it is not necessary to include safety factors.

Anticipated Seating and Unseating Torque Values - lbs. in. (Undercut Valves)

Valve Size, in.	Shut Off Pressure psi, Normal Service 50
2	69
2.5	101
3	138
4	196
5	308
6	430
8	786
10	1280
12	1832

For conditions that vary from those noted, then apply the following Application Factor Multipliers:

Operated less than once per day	x 1.2
Dry Service with gas or air	x 1.5
Dry Service with abrasives, cement	x 1.7
Lubrication oils	x 0.5
Temperature - lower than 24°F	x 1.2
- higher than 200°F	x 1.2

Chemical attack: Consult your sales representative

To apply the as noted Application Factor Multipliers:

1. Find the base torque value by selecting the required valve size from the left hand column and read across to the intended line pressure column. Note the torque value. (You can interpolate between line pressure values.)
2. Multiply the noted value by the expected Application Factors.
3. The result provides the new torque value specific to the actual service conditions.

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Specifications

Maximum Allowable Stem Torques - lbs. in.

Valve Size	2	2.5	3	4	5	6	8	10	12
416 SS	620	1044	1044	1548	2478	2478	4380	8585	8585
316 SS	575	974	974	1416	2301	2301	4248	8585	8585

Flow Rate Coefficient - C_V Values

Size, in.	Disc Opening (Degrees) 10°	20°	30°	40°	50°	60°	70°	80°	90°
2	0	1	6	16	35	54	83	114	125
2.5	0	3	13	31	58	90	142	199	251
3	0	7	32	64	105	163	249	351	473
4	0	16	66	126	205	306	471	694	933
5	0	32	98	183	289	405	728	1114	1446
6	8	60	150	261	424	668	1141	1793	2250
8	25	133	267	468	747	1190	2050	3364	4065
10	39	200	392	741	1133	1787	3095	5143	6712
12	57	292	572	1081	1653	2607	4514	7757	10301

Note
C_V = The valve flow capacity expressed as the flow rate of 70°F water, in US gallons per minute, which produces a 1 psi pressure drop across the valve.

Simplified Sizing Formulas

Liquid

$$C_V = Q\sqrt{\frac{S.G.}{\Delta P}}$$

Where:
Q = Flow through valve (USG per minute)
S.G. = Specific gravity (water = 1)
ΔP = Pressure drop across valve (psi)

Gas

$$C_V = \frac{1}{Q}\sqrt{\frac{(S.G.)}{(P_2)\,(\Delta P)}}$$

Where:
Q = Flow through valve (SCFM)
S.G. = Specific gravity (air = 1)
ΔP = Pressure drop across valve (psi) [Less than 1/2 inlet pressure (psi)]
P_2 = Outlet pressure (psi)

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Series 61 Ordering Information

Example:	020	61	W	D	R	S	1		0

a 2" wafer style valve with ductile iron body, nylon coated disc, 416 SS stem, EPDM seat, and no actuation

020 61W DRS1 0

Size

020	–	2"
025	–	2.5"
030	–	3"
040	–	4"
050	–	5"
060	–	6"
080	–	8"
100	–	10"
120	–	12"

Series

61

Body Style

W	–	Wafer
L	–	Lug

Body

D	–	Ductile Iron (A536)

Disc Material

T	–	Super Duplex
R	–	Ductile Iron/Nylon

Stem Material

S	–	416 Stainless Steel (Standard)
P	–	316 Stainless Steel (Optional)
T	–	Super Duplex

Seat Material

1	–	EPDM (Food Grade)
2	–	NBR (Food Grade)

Special Requirements (if no Special Requirements, leave blank)

U	–	50 psi Rating

Actuation

0	–	None
1	–	Handle
2	–	Gear
3	–	Chain Wheel
4	–	Pneumatic DA
5	–	Pneumatic SR
6	–	Electric
X	–	Other

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Additional Keystone Products

Keystone K-LOK ANSI rated high performance valves are available in ASME 150 and ASME 300 pressure classes. They are available in a variety of trims to meet your higher pressure and temperature requirements.

Keystone Figure 106 large diameter butterfly valves are offered in sizes from 24" to 48" for your larger diameter valve requirements.

Tyco Flow Control offers a complete line of actuation and controls to meet all of your automation needs.

Keystone
MRP Pneumatic Rack and Pinion Actuators

Keystone
EPI$_2$ Electric Actuator

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