

KEYSTONE

- 61W - Wafer style resilient seated butterfly valves
- 61L - Lugged style resilient seated butterfly valves

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 prevents moisture penetrating into the stem area.
- 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

These valves are ideally suited to many applications where tight shut-off is required, such as:

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

Technical Data

Size Range: 14" thru 24"
Pressure: 150 psi
End of line: 90 psi
Temperature: -40°F to +300°F
End Connection: ASME 125/150

tyco / Flow Control

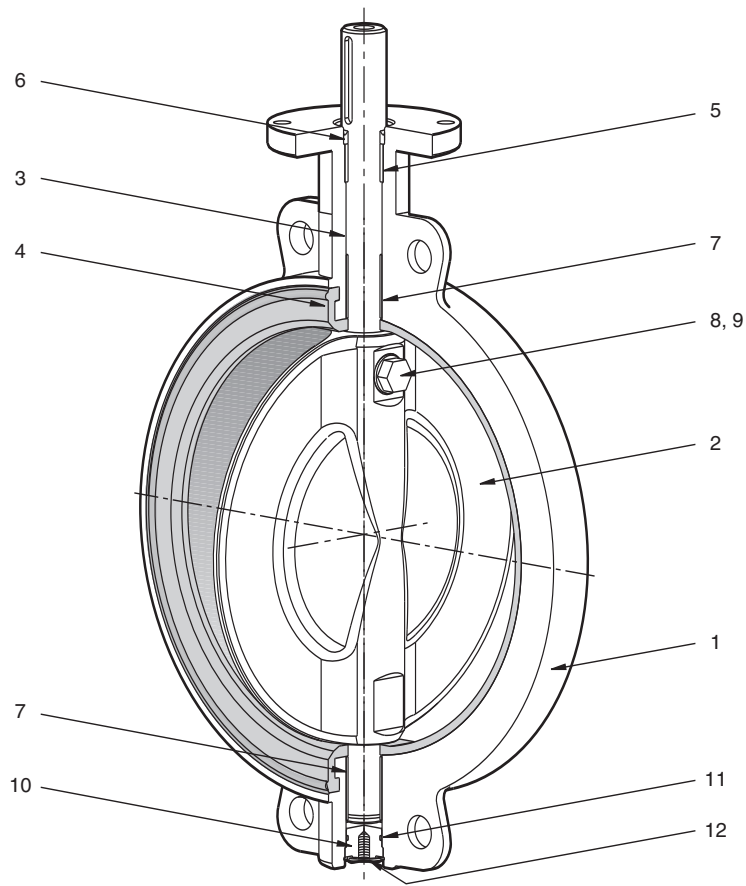
Total Flow Control Solutions™

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Keystone Butterfly Valves - Series 61

14" thru 24"

Specifications



Temperature Rating

- 40°F to +250°F with EPDM
- +5°F to +212°F with NBR
- 22°F to +300°F with HT EPDM

Notes

PED approved valves have a temperature limitation of -20°F due to body material.
Consult factory for available trims.

Parts List

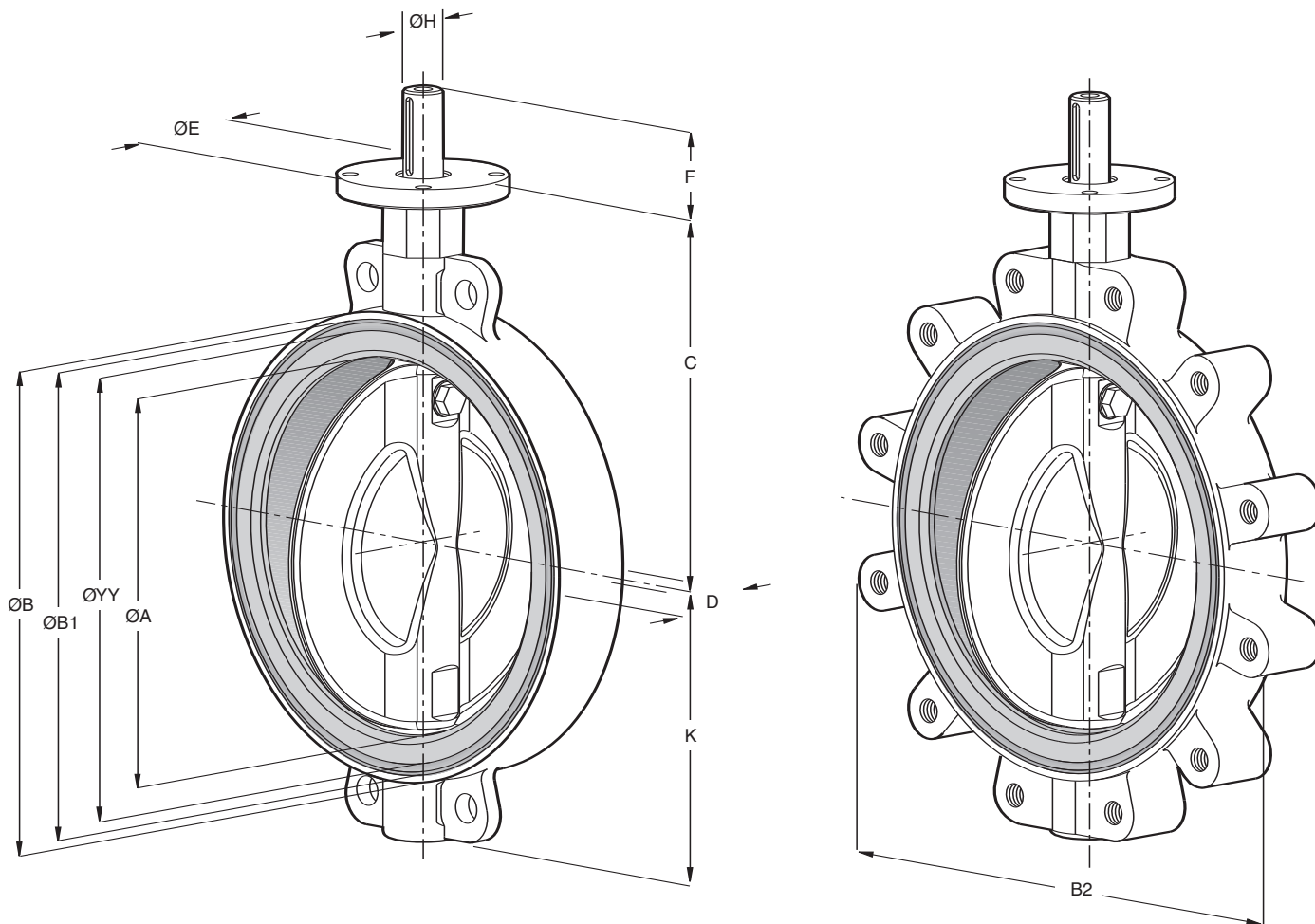
No.	Description	Standard Material	Material Specification
1	Body	Ductile Iron	ASTM A536 Gr 65-45-12
2	Disc	316 Stainless Steel Super Duplex Aluminum Bronze Ductile Iron (ENP Coated) Ductile Iron (Nylon Coated)	ASTM A351 Gr CF8M ASTM A890 5A ASTM B148 C95200 ASTM A536 Gr 65-45-12 ASTM A536 Gr 65-45-12
3	Stem	431 Stainless Steel (Standard) Super Duplex Stainless Steel (Optional)	EN10088-3 X17CrNi16-2 EN10088-3 X2CrNiMoN25-7-4
4	Seat	EPDM (Food Grade) NBR (Food Grade) Viton® HT EPDM (Food Grade)	- - - -
5	Stem Bush	Polyacetal	-
6	Stem Seal	NBR	-
7	Bearings	PFTE Steel Backed	-
8	Disc Screw	Duplex Stainless Steel	EN10088-3 X2CrNiMoN22-5-3
9	Disc Screw O-ring	NBR	-
10	Body Plug	Carbon Steel	AS1443 1040
11	Body Plug O-ring	NBR	-
12	Circlip	Carbon Spring Steel	DIN472

Notes

ENP = Electroless Nickel Plated
(for corrosion resistance)

Viton® is a registered trademark of DuPont Dow Elastomers.

Specifications



Dimensions, inches

Valve Stem Size Conn. in. Code	ØA	ØB	ØB1	B2	C	D	ØE	F	K	Q	ØYY	Stem Conn.		Top Plate		Weight	
												H in.	Key in.	Bolt Circle	Hole Dia.	Wafer	Lug
14 CAG	12.80	16.38	15.67	20.75	12.80	3.07	6.00	3.00	10.24	12.56	14.88	1 3/8	5/16 x 5/16	5.00	9/16	93.00	132.00
16 CAG	14.96	18.66	17.91	23.07	14.17	4.02	6.00	3.00	11.73	14.53	17.13	1 3/8	5/16 x 5/16	5.00	9/16	141.00	265.00
18 DAH	17.09	21.02	20.28	26.06	15.55	4.49	8.00	3.00	13.15	16.61	19.49	1 5/8	3/8 x 3/8	6.50	13/16	188.00	318.00
20 DAJ	19.13	23.19	22.40	28.19	16.93	5.00	8.00	4.25	14.57	18.58	21.61	1 7/8	1/2 x 3/8	6.50	13/16	236.00	382.00
24 DAK	23.03	27.20	26.38	32.56	19.69	6.06	8.00	4.25	17.44	22.40	25.59	2 1/4	1/2 x 3/8	6.50	13/16	324.00	552.00

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.

"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.

Dimensions

Anticipated Seating and Unseating Torque Values - lbs. in.

Valve Size, in	Shut Off Pressure psi, Normal Service			
	0	50	100	150
14	3761	4354	4947	5841
16	5053	5947	6841	8169
18	6602	7868	9133	11036
20	8408	10142	11877	14479
24	12833	15833	18833	23337

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 factory	

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 20" Series 61 valve is to be used in a clean water application. The line pressure is 150 psi @ 210°F. The valve may only cycle twice per month.

1. Using the Normal Service Torque Values table base torque value for 20" @ 150 psi = **14479 lbs. in.**
2. Find torque value at zero psi = **8408 lbs. in.**
Subtract **14479 - 8408 = 6071 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 $1.2 \times 1.2 = 1.44$ (round off to 1.4) **8408 x 1.4 = 11771 lbs. in.**
4. Add the difference between zero pressure and line pressure, as per step 2, to the value determined in step 3: **6071 + 11771 = 17842 lbs. in.**

The new torque value for this valve, specific to the actual service conditions is 17842 lbs. in.

Specifications

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

Valve Size, in.	Shut Off Pressure psi, Normal Service 50
14	3505
16	4901
18	6622
20	8687
24	14002

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 factory	

Maximum Allowable Stem Torques - lbs. in.

	Valve Size, in.				
	14	16	18	20	24
431 SS	14,603	17,585	30,417	33,798	57,799
Super Duplex SS	13,381	17,585	29,497	33,798	57,799

Specifications

Flow Rate Coefficient - C_v Values

Size, in.	Disc Opening (Degrees)								
	10°	20°	30°	40°	50°	60°	70°	80°	90°
14	138	351	736	1320	2238	3595	5792	10369	12031
16	179	459	962	1725	2924	4696	7565	13542	15713
18	227	582	1217	2183	3699	5943	9582	17140	19888
20	280	718	1503	2695	4568	7338	11820	21160	24553
24	403	1034	2163	3881	6577	10566	17021	30471	35356

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

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

Gas

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

Where:

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

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)

Series 61 Ordering Information

Example:

a 14" wafer style valve with ductile iron body, nylon coated disc, 316 SS stem, EPDM seat, and no actuation

140 61W DRS1 0

140 61 W D R S 1 0

Size

- 140 - 14"
- 160 - 16"
- 180 - 18"
- 200 - 20"
- 240 - 24"

Series

61

Body Style

- W - Wafer
- L - Lug

Body

- D - Ductile Iron (A536)

Disc Material

- S - 316 Stainless Steel
- T - Super Duplex
- A - Aluminum Bronze
- D - Ductile Iron
- R - Ductile Iron/Nylon
- X - Special

Stem Material

- S - 416 Stainless Steel (Standard)
- T - Super Duplex
- X - Special

Seat Material

- 1 - EPDM (Food Grade)
- 2 - NBR (Food Grade)
- 3 - Viton®
- 4 - HT EPDM (Food Grade)

Special Requirements (if no Special Requirements leave blank)

- U - Undercut
- S - Silicone Free
- X - Other

Actuation

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

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 higher temperature requirements.



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

Tyco Flow Control offers a complete line of actuation and controls to meet all your automation needs. This allows us to supply a complete package for single source responsibility.



Keystone MRP Pneumatic Rack & Pinion Actuators



Keystone EPI₂ Electric Actuator

For more specific information on the above products and additional products, please visit the following websites:

www.keystonevalves.com

www.tycoflowcontrol.com

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