

KEYSTONE SERIES GR RESILIENT SEATED BUTTERFLY VALVES GRW/GRL

A heavy duty industrial resilient seated butterfly valve



FEATURES

- Wafer and lugged body design with face-to-face dimension, according to EN 558 Series 20 and API 609.
- 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.
- The two piece shaft allows for a thin disc and provides minimal obstruction to flow (up to NPS 12).
- Rounded polished disc edge gives full concentric sealing, lower torques, longer seat life and drop-tight shut-off.
- Body locating holes allow ease of installation and centering between the flanges.
- 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: NSF/ASME Std 61, ACS, KIWA, WRAS, DVGW-G, ABS, CU-TR.

GENERAL APPLICATION

Water, air, dry bulk conveying etc. These valves are for any service where a drop-tight shut-off with maximum flow area is required.

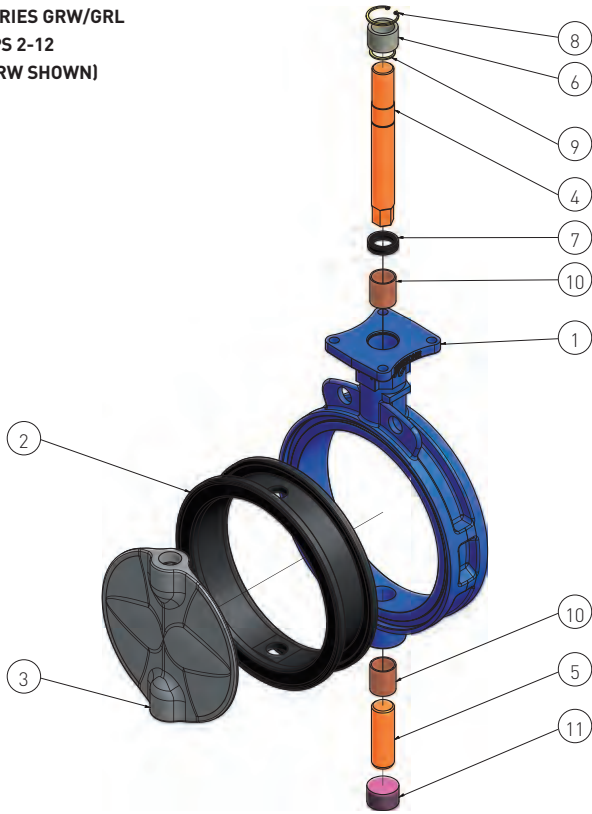
TECHNICAL DATA

| | |
|------------------------|---|
| Pressure (psi): | 230 psi NPS 2-12 150 psi NPS 14-36 |
| End of line (psi): | 150 psi NPS 2-12 90 psi NPS 14-36 |
| Vacuum service (psia): | 5.8 psia |
| Temperature (°F): | -40 to +320 |
| Sizes (NPS): | 2-36 |
| Flange accommodation: | PN 6/10/16 ASME 125/150 JIS 10K BS Table E AS4087 PN 16 AS2129 Table E |

KEYSTONE SERIES GR RESILIENT SEATED BUTTERFLY VALVES

GRW/GRL

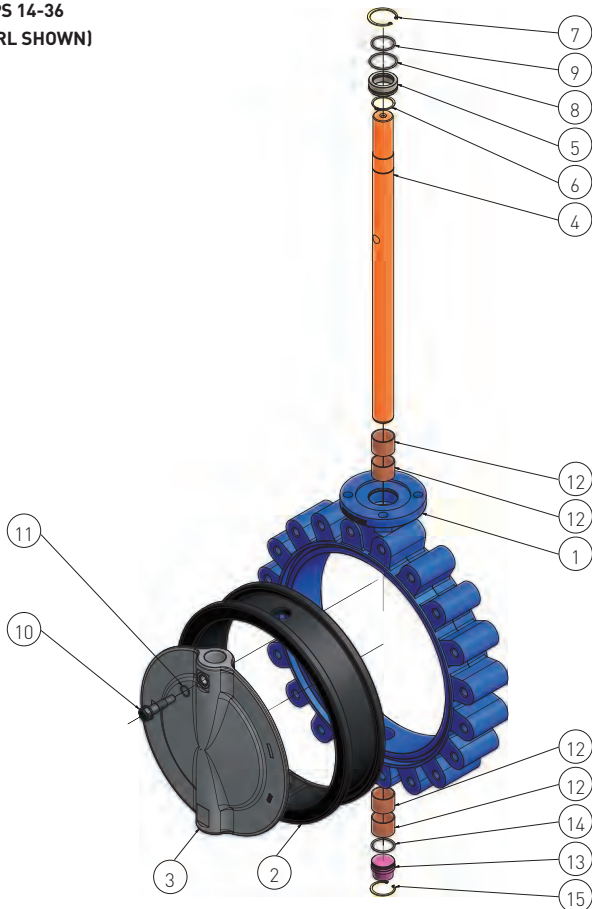
SERIES GRW/GRL
NPS 2-12
(GRW SHOWN)



PARTS LIST

| Item | Qty | Description |
|------|-----|-------------------------|
| 1 | 1 | Body |
| 2 | 1 | Seat |
| 3 | 1 | Disc |
| 4 | 1 | Upper shaft |
| 5 | 1 | Lower shaft |
| 6 | 1 | Upper bushing |
| 7 | 1 | Packing |
| 8 | 1 | Body circlip |
| 9 | 1 | Shaft circlip |
| 10 | 2 | Upper and lower bearing |
| 11 | 1 | Plug |

NPS 14-36
(GRL SHOWN)



PARTS LIST

| Item | Qty | Description |
|------|-----|-------------------------|
| 1 | 1 | Body |
| 2 | 1 | Seat |
| 3 | 1 | Disc |
| 4 | 1 | Shaft |
| 5 | 1 | Bushing |
| 6 | 1 | Shaft circlip |
| 7 | 1 | Body circlip |
| 8 | 1 | Body O-ring |
| 9 | 1 | Shaft O-ring |
| 10 | 1 | Disc screw |
| 11 | 1 | Disc screw O-ring |
| 12 | 4 | Upper and lower bearing |
| 13 | 1 | Plug |
| 14 | 1 | Plug O-ring |
| 15 | 1 | Plug circlip |

KEYSTONE SERIES GR RESILIENT SEATED BUTTERFLY VALVES

GRW/GRL

MATERIAL SPECIFICATION

| Part name | Material | Material specification | Remark |
|--------------------|---|---|---|
| NPS 2-12 | | | |
| Body | Ductile iron | ASTM A536 Gr 65-45-12 ASTM A395 Gr 60-40-18 | (Optional) |
| Disc | Super duplex 316 stainless steel 304 stainless steel Aluminium bronze Nickel aluminium bronze Ductile iron NYL Ductile iron CTD | ASTM A890 Gr 5A ASTM A351 Gr CF8M ASTM A351 Gr CF8 ASTM B148 UNS C95200 ASTM B148 UNS C95800 ASTM A536 Gr 65-45-12 ASTM A536 Gr 65-45-12 | NYL = Nylon coating, max. temp. 140°F CTD = Nickel plating |
| Shaft | 316 stainless steel 431 stainless steel Super duplex | ASTM A276 Gr 316 ASTM A276 Gr 431 ASTM A276 UNS S32750 | |
| Seat | EPDM EPDM E1 NBR NBR N1 White NBR Fluoroelastomer (FKM) | | Food grade, NSF61, ACS KIWA, WRAS, ACS Food grade DVGW-G Food grade |
| Bushing | Polyester | | |
| Packing | NBR | | |
| Bearing | PTFE/steel | | |
| Circlip | Stainless steel | | |
| Plug | Carbon steel | | |
| NPS 14-36 | | | |
| Body | Ductile iron | ASTM A536 Gr 65-45-12 ASTM A395 Gr 60-40-18 | (Optional) |
| Disc | Super duplex Duplex 316 stainless steel 304 stainless steel Aluminium bronze Nickel aluminium bronze Ductile iron NYL Ductile iron CTD | ASTM A890 Gr 5A ASTM A890 Gr 4A ASTM A351 Gr CF8M ASTM A351 Gr CF8 ASTM B148 UNS C95200 ASTM B148 UNS C95800 ASTM A536 Gr 65-45-12 ASTM A536 Gr 65-45-12 | NYL = Nylon coating, max. temp. 140°F CTD = Epoxy coated, max. temp. 250°F |
| Shaft | 431 stainless steel Duplex Super duplex | ASTM A276 Gr 431 S43100 ASTM A276 UNS S31803 ASTM A276 UNS S32750 | |
| Seat | EPDM EPDM E1 NBR NBR N1 White NBR Fluoroelastomer (FKM) | | Food grade, NSF61, ACS KIWA, WRAS, ACS Food grade DVGW-G Food grade |
| Disc screw | Super duplex Duplex | ASTM A276 UNS S32750 ASTM A276 UNS S31803 | |
| Disc screw O-ring | EPDM NBR FKM | | |
| Plug | Carbon steel | | |
| Plug O-ring | NBR | | |
| Plug circlip | Stainless steel | | |
| Bushing | Polyester | | |
| Shaft/Body O-ring | NBR | | |
| Bearing | PTFE/steel | | |
| Shaft/Body circlip | Stainless steel | | |

NOTE:

Valves with super duplex disc will have super duplex disc screw. All other discs will have a duplex disc screw.

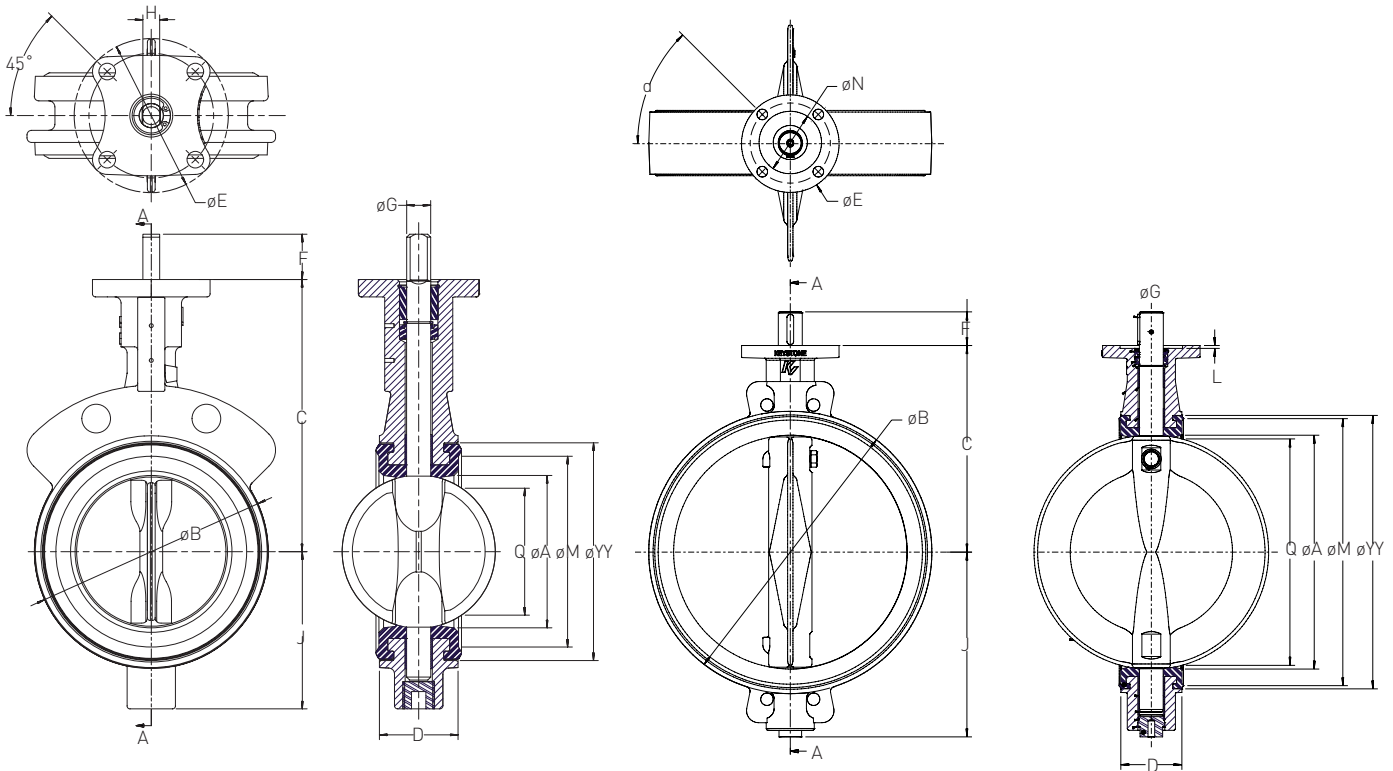
KEYSTONE SERIES GR RESILIENT SEATED BUTTERFLY VALVES

GRW/GRL

SERIES GRW (WAFER)

NPS 2-12

NPS 14-36



VALVE DIMENSIONS (in)

| Size (NPS) | Shaft | | | | | | | | | | | | Top plate drilling | | | | Adapt. code ⁽⁴⁾ | Weight ⁽³⁾ (lbs) | | | |
|---------------|-------|-------|-------|------|-------|------|-------|------|-------|------|------------------|-------|--------------------|------------------|-------------|----------------|-------------------------------|--------------------------------|--------------|-----|--------------|
| | A | B | C | D | E | F | J | L | M | N | Q ⁽¹⁾ | YY | G | H ⁽²⁾ | Key | Bolt circle | | | No. holes | a | Hole dia. |
| 2 | 1.97 | 3.58 | 5.31 | 1.69 | 3.94 | 0.98 | 2.36 | - | 2.60 | - | 1.10 | 3.15 | 5/8 | 7/16 | - | 3 1/4 | 4 | 45° | 0.43 | BAC | 4.5 |
| 2.5 | 2.44 | 4.13 | 5.91 | 1.81 | 3.94 | 1.18 | 2.99 | - | 3.07 | - | 1.70 | 3.66 | 3/16 | 3/8 | - | 3 1/4 | 4 | 45° | 0.43 | BAB | 6 |
| 3 | 3.03 | 4.84 | 6.30 | 1.81 | 3.94 | 1.18 | 3.23 | - | 3.82 | - | 2.56 | 4.41 | 3/16 | 3/8 | - | 3 1/4 | 4 | 45° | 0.43 | BAB | 7 |
| 4 | 3.90 | 6.06 | 7.09 | 2.05 | 3.94 | 1.18 | 4.09 | - | 5.08 | - | 3.43 | 5.67 | 5/8 | 7/16 | - | 3 1/4 | 4 | 45° | 0.43 | BAC | 9.5 |
| 5 | 4.88 | 7.36 | 7.68 | 2.20 | 3.94 | 1.18 | 4.72 | - | 6.30 | - | 4.45 | 6.89 | 3/4 | 1/2 | - | 3 1/4 | 4 | 45° | 0.43 | BAD | 13 |
| 6 | 5.91 | 8.19 | 8.27 | 2.20 | 3.94 | 1.18 | 5.16 | - | 7.13 | - | 5.59 | 7.72 | 3/4 | 1/2 | - | 3 1/4 | 4 | 45° | 0.43 | BAD | 15 |
| 8 | 7.68 | 10.43 | 9.45 | 2.36 | 5.91 | 1.26 | 6.38 | - | 9.17 | - | 7.40 | 9.76 | 7/8 | 5/8 | - | 5 | 4 | 45° | 0.53 | CAE | 26 |
| 10 | 9.65 | 12.6 | 10.83 | 2.68 | 5.91 | 1.97 | 7.80 | - | 11.42 | - | 9.33 | 12.01 | 1 1/8 | - | 1/4 x 1/4 | 5 | 4 | 45° | 0.53 | CAF | 42 |
| 12 | 11.46 | 14.65 | 12.20 | 3.07 | 5.91 | 1.97 | 9.06 | - | 13.39 | - | 11.14 | 13.98 | 1 1/8 | - | 1/4 x 1/4 | 5 | 4 | 45° | 0.53 | CAF | 59 |
| 14 | 12.80 | 16.38 | 12.80 | 3.07 | 5.90 | 2.99 | 10.24 | - | 14.88 | - | 12.50 | 15.67 | 1 3/8 | - | 5/16 x 5/16 | 5 | 4 | 45° | 0.53 | CAG | 88 |
| 16 | 14.96 | 18.66 | 14.17 | 4.02 | 5.90 | 2.99 | 11.73 | - | 17.13 | - | 14.50 | 17.91 | 1 3/8 | - | 5/16 x 5/16 | 5 | 4 | 45° | 0.53 | CAG | 134 |
| 18 | 17.09 | 21.02 | 15.55 | 4.49 | 8.00 | 2.99 | 13.15 | 0.24 | 19.49 | 5.12 | 16.60 | 20.28 | 1 5/8 | - | 3/8 x 3/8 | 6 1/2 | 4 | 45° | 0.87 | DAH | 190 |
| 20 | 19.13 | 23.19 | 16.93 | 5.00 | 8.00 | 4.25 | 15.16 | 0.24 | 21.61 | 5.12 | 18.60 | 22.40 | 1 7/8 | - | 1/2 x 3/8 | 6 1/2 | 4 | 45° | 0.87 | DAJ | 234 |
| 24 | 23.03 | 27.20 | 19.69 | 6.06 | 8.00 | 4.25 | 17.95 | 0.24 | 25.59 | 5.12 | 22.30 | 26.38 | 1 7/8 | - | 1/2 x 3/8 | 6 1/2 | 4 | 45° | 0.87 | DAJ | 348 |
| 28 | 26.97 | 31.50 | 22.44 | 6.50 | 8.00 | 4.25 | 20.39 | 0.24 | 29.72 | 5.12 | 26.30 | 30.51 | 2 1/4 | - | 1/2 x 3/8 | 6 1/2 | 4 | 45° | 0.87 | DAK | 509 |
| 30 | 28.94 | 33.94 | 23.82 | 6.50 | 8.00 | 4.25 | 21.69 | 0.24 | 32.13 | 5.12 | 28.30 | 32.87 | 2 1/4 | - | 1/2 x 3/8 | 6 1/2 | 4 | 45° | 0.87 | DAK | 597 |
| 32 | 30.91 | 35.71 | 25.20 | 7.48 | 11.81 | 5.51 | 22.95 | 0.24 | 33.86 | 7.87 | 30.10 | 34.65 | 2 7/8 | - | 3/4 x 1/2 | 10 | 8 | 22.5° | 0.69 | KAV | 719 |
| 36 | 34.84 | 39.65 | 28.15 | 7.99 | 11.81 | 5.51 | 25.94 | 0.24 | 37.80 | 7.87 | 34.00 | 38.58 | 2 7/8 | - | 3/4 x 1/2 | 10 | 8 | 22.5° | 0.69 | KAV | 924 |

NOTES:

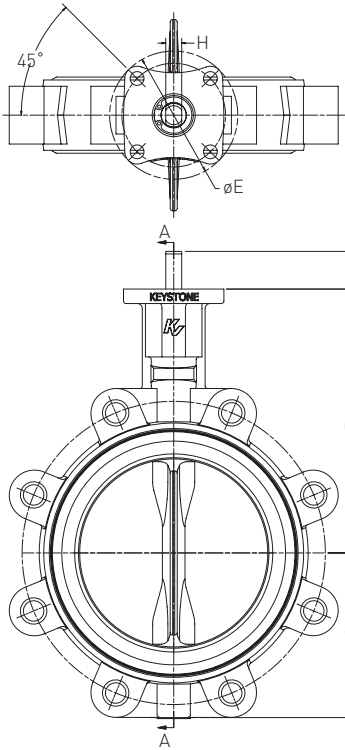
- (1) 'Q' dimension is the minimum allowable pipe or flange inside diameter at the centered body face to protect the disc sealing edge against damage when opening the valve.
- (2) 'H' dimension refers to flat on shaft.
- (3) Weight may vary depending on trim materials used.
- (4) NPS 2 - actual shaft dimension is 1/2 in x 1/2 in A/F and is fitted with an adaptor to produce a BAC connection.

KEYSTONE SERIES GR RESILIENT SEATED BUTTERFLY VALVES

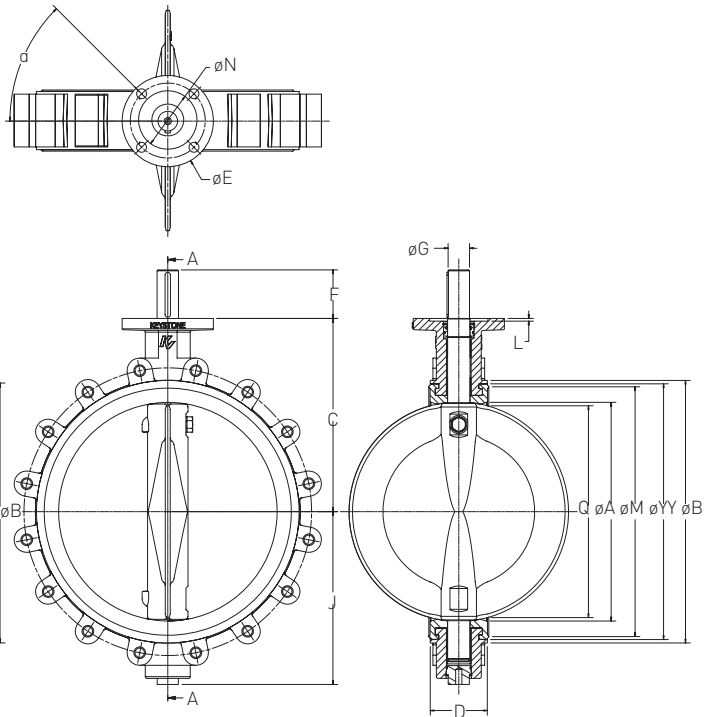
GRW/GRL

SERIES GRL (LUG)

NPS 2-12



NPS 14-36



VALVE DIMENSIONS (in)

| Size (NPS) | | | | | | | | | | | | Shaft | | | Top plate drilling | | | Adapt. code ⁽⁴⁾ | Weight ⁽³⁾ (lbs) | | |
|-------------------|-------|-------|-------|------|-------|------|-------|------|-------|------|------------------|-------|-------|------------------|--------------------|----------------|--------------|-------------------------------|--------------------------------|--------------|------|
| | A | B | C | D | E | F | J | L | M | N | Q ⁽¹⁾ | YY | G | H ⁽²⁾ | Key | Bolt circle | No. holes | | | Hole dia. | |
| 2 | 1.97 | 3.62 | 5.31 | 1.69 | 3.94 | 0.98 | 2.36 | - | 2.60 | - | 1.10 | 3.15 | 5/8 | 7/16 | - | 3 1/4 | 4 | 45° | 0.43 | BAC | 7 |
| 2.5 | 2.44 | 4.13 | 5.91 | 1.81 | 3.94 | 1.18 | 2.99 | - | 3.07 | - | 1.70 | 3.66 | 3/4 | 3/8 | - | 3 1/4 | 4 | 45° | 0.43 | BAB | 9 |
| 3 | 3.03 | 4.96 | 6.30 | 1.81 | 3.94 | 1.18 | 3.23 | - | 3.82 | - | 2.56 | 4.41 | 3/4 | 3/8 | - | 3 1/4 | 4 | 45° | 0.43 | BAB | 10 |
| 4 | 3.90 | 6.14 | 7.09 | 2.05 | 3.94 | 1.18 | 4.09 | - | 5.08 | - | 3.43 | 5.67 | 3/4 | 7/16 | - | 3 1/4 | 4 | 45° | 0.43 | BAC | 15 |
| 5 | 4.88 | 7.48 | 7.68 | 2.20 | 3.94 | 1.18 | 4.72 | - | 6.30 | - | 4.45 | 6.89 | 3/4 | 1/2 | - | 3 1/4 | 4 | 45° | 0.43 | BAD | 21.5 |
| 6 | 5.91 | 8.43 | 8.27 | 2.20 | 3.94 | 1.18 | 5.16 | - | 7.13 | - | 5.59 | 7.72 | 3/4 | 1/2 | - | 3 1/4 | 4 | 45° | 0.43 | BAD | 24 |
| 8 | 7.68 | 10.55 | 9.45 | 2.36 | 5.91 | 1.26 | 6.38 | - | 9.17 | - | 7.40 | 9.76 | 7/8 | 5/8 | - | 5 | 4 | 45° | 0.53 | CAE | 38 |
| 10 | 9.65 | 12.60 | 10.83 | 2.68 | 5.91 | 1.97 | 7.80 | - | 11.42 | - | 9.33 | 12.01 | 1 1/8 | - | 1/4 x 1/4 | 5 | 4 | 45° | 0.53 | CAF | 65 |
| 12 | 11.46 | 14.76 | 12.20 | 3.07 | 5.91 | 1.97 | 9.06 | - | 13.39 | - | 11.14 | 13.98 | 1 1/8 | - | 1/4 x 1/4 | 5 | 4 | 45° | 0.53 | CAF | 90 |
| 14 | 12.80 | 16.38 | 12.80 | 3.07 | 5.90 | 2.99 | 10.24 | - | 14.88 | - | 12.51 | 15.67 | 1 3/8 | - | 5/16 x 5/16 | 5 | 4 | 45° | 0.53 | CAG | 115 |
| 16 | 14.96 | 18.66 | 14.17 | 4.02 | 5.90 | 2.99 | 11.73 | - | 17.13 | - | 14.50 | 17.91 | 1 3/8 | - | 5/16 x 5/16 | 5 | 4 | 45° | 0.53 | CAG | 194 |
| 18 | 17.09 | 21.02 | 15.55 | 4.49 | 8.00 | 2.99 | 13.15 | 0.24 | 19.49 | 5.12 | 16.58 | 20.28 | 1 5/8 | - | 3/8 x 3/8 | 6 1/2 | 4 | 45° | 0.87 | DAH | 236 |
| 20 | 19.13 | 23.19 | 16.93 | 5.00 | 8.00 | 4.25 | 15.16 | 0.24 | 21.61 | 5.12 | 18.56 | 22.40 | 1 7/8 | - | 1/2 x 3/8 | 6 1/2 | 4 | 45° | 0.87 | DAJ | 355 |
| 24 | 23.03 | 27.20 | 19.69 | 6.06 | 8.00 | 4.25 | 17.95 | 0.24 | 25.59 | 5.12 | 22.35 | 26.38 | 1 7/8 | - | 1/2 x 3/8 | 6 1/2 | 4 | 45° | 0.87 | DAJ | 518 |
| 28 | 26.97 | 31.50 | 22.44 | 6.50 | 8.00 | 4.25 | 20.39 | 0.24 | 29.72 | 5.12 | 26.30 | 30.51 | 2 1/4 | - | 1/2 x 3/8 | 6 1/2 | 4 | 45° | 0.87 | DAK | 694 |
| 30 | 28.94 | 33.94 | 23.82 | 6.50 | 8.00 | 4.25 | 21.69 | 0.24 | 32.13 | 5.12 | 28.31 | 32.87 | 2 1/4 | - | 1/2 x 3/8 | 6 1/2 | 4 | 45° | 0.87 | DAK | 833 |
| 32 | 30.91 | 35.71 | 25.20 | 7.48 | 11.81 | 5.51 | 22.95 | 0.24 | 33.86 | 7.87 | 30.12 | 34.65 | 2 7/8 | - | 3/4 x 1/2 | 10 | 8 | 22.5° | 0.69 | KAV | 966 |
| 36 ⁽⁵⁾ | 34.84 | 39.65 | 28.15 | 7.99 | 11.81 | 5.51 | 25.94 | 0.24 | 37.80 | 7.87 | 34.03 | 38.58 | 2 7/8 | - | 3/4 x 1/2 | 10 | 8 | 22.5° | 0.69 | KAV | 1232 |

For ASME 125/150 - flange bolt threads for NPS 2-16 are UNC
 - flange bolt threads for NPS 18-36 are 8UN

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) 'H' dimension refers to flat on shaft.
- (3) Weight may vary depending on trim materials used.
- (4) NPS 2 - actual shaft dimension is 1/2 in x 1/8 in A/F and is fitted with an adaptor to produce a BAC connection.
- (5) Valve size NPS 36 is tapped flange design and has no separate lugs.

KEYSTONE SERIES GR RESILIENT SEATED BUTTERFLY VALVES

GRW/GRL

DIMENSIONS OF TAPPED FLANGE LOCATING HOLES (in)

| Size (NPS) | Series GRW | | Series GRL | |
|---------------|------------|------|------------|------|
| | U | V | U | V |
| 28 | 1.8 | 0.22 | 1.8 | 0.22 |
| 30 | 2.1 | 0.49 | 1.8 | 0.22 |
| 32 | 2.4 | 0.79 | 1.8 | 0.22 |
| 36 | 2.1 | 0.26 | 2.1 | 0.26 |

NOTE:

All holes in lugged version are through threaded, except the holes closest to top and bottom shaft.

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 32°F to maximum temperature rating of the elastomer seat.

Application II

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

Temperature range from 32°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 32°F to maximum temperature rating of the elastomer seat.

Application IV

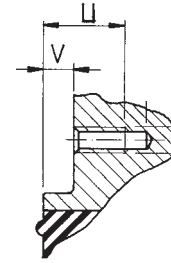
- a. Dry abrasive media and degreasing applications (sand, cement, silicone free, oxygen cleaned);
or
- b. Liquids with severe deposit; or
- c. Valves not frequently operated (once a year).

All above with temperature range from 15°F to maximum temperature rating of the elastomer seat.

Notes:

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

SERIES GRW & GRL



KEYSTONE SERIES GR RESILIENT SEATED BUTTERFLY VALVES

GRW/GRL

VALVE SEATING AND UNSEATING TORQUES (in lbs)

| Differential pressure (psi) | Valve size (NPS) | | | | | | | | | | | | | | | | | |
|-----------------------------|------------------|-----|-----|-----|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|----------------------|-------|
| | 2 | 2.5 | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 24 | 28 | 30 | 32 | 36 |
| I* | | | | | | | | | | | | | | | | | | |
| 50 | 115 | 168 | 230 | 327 | 513 | 717 | 1310 | 2133 | 3054 | 4137 | 5654 | 7479 | 9635 | 15043 | 22076 | 26264 | 30933 | 39137 |
| 100 | 115 | 177 | 239 | 354 | 558 | 779 | 1452 | 2399 | 3425 | 4605 | 6363 | 8500 | 11048 | 17518 | 26045 | 31164 | 36899 | 46688 |
| 150 | 124 | 186 | 266 | 389 | 620 | 876 | 1664 | 2788 | 3992 | 5262 | 7360 | 9936 | 13038 | 21007 | 31641 | 38076 | 45315 | 57340 |
| 200 | 133 | 204 | 292 | 434 | 708 | 1000 | 1938 | 3310 | 4744 | | | | | | | | | |
| 230 | 133 | 221 | 319 | 451 | 752 | 1062 | 2080 | 3567 | 5116 | | | | | | | | | |
| 50 (U/C) | 69 | 101 | 138 | 196 | 308 | 430 | 786 | 1280 | 1832 | 2482 | 3393 | 4487 | 5781 | 9026 | 13246 | 15758 | 18560 | 23482 |
| II* | | | | | | | | | | | | | | | | | | |
| 50 | 124 | 186 | 257 | 372 | 584 | 823 | 1496 | 2425 | 3469 | 4673 | 6354 | 8364 | 10728 | 16617 | 24218 | 28723 | 33731 | 42679 |
| 100 | 124 | 195 | 274 | 398 | 628 | 885 | 1637 | 2682 | 3841 | 5129 | 7048 | 9366 | 12118 | 19059 | 28142 | 33572 | 39638 | 50155 |
| 150 | 133 | 204 | 292 | 434 | 690 | 982 | 1841 | 3071 | 4408 | 5770 | 8023 | 10775 | 14074 | 22498 | 33670 | 40404 | 47966 ⁽¹⁾ | 60695 |
| 200 | 142 | 230 | 319 | 478 | 779 | 1106 | 2124 | 3593 | 5160 | | | | | | | | | |
| 230 | 150 | 239 | 336 | 496 | 823 | 1168 | 2257 | 3859 | 5541 | | | | | | | | | |
| 50 (U/C) | 74 | 112 | 154 | 223 | 350 | 494 | 897 | 1455 | 2082 | 2804 | 3812 | 5018 | 6437 | 9970 | 14531 | 17234 | 20239 | 25607 |
| III* | | | | | | | | | | | | | | | | | | |
| 50 | 133 | 204 | 283 | 425 | 655 | 929 | 1682 | 2708 | 3885 | 5208 | 7053 | 9249 | 11821 | 18191 | 26361 | 31183 | 36529 | 46220 |
| 100 | 142 | 212 | 301 | 443 | 699 | 991 | 1823 | 2974 | 4257 | 5654 | 7733 | 10233 | 13188 | 20600 | 30239 | 35979 | 42378 | 53622 |
| 150 | 142 | 230 | 319 | 478 | 761 | 1080 | 2027 | 3363 | 4824 | 6277 | 8685 | 11614 | 15109 | 23989 | 35700 | 42734 | 50617 ⁽¹⁾ | 64050 |
| 200 | 150 | 248 | 354 | 522 | 850 | 1204 | 2310 | 3885 | 5567 | | | | | | | | | |
| 230 | 159 | 257 | 363 | 540 | 894 | 1266 | 2443 | 4142 | 5948 | | | | | | | | | |
| 50 (U/C) | 80 | 122 | 170 | 255 | 393 | 558 | 1009 | 1625 | 2331 | 3125 | 4232 | 5550 | 7093 | 10915 | 15817 | 18710 | 21918 | 27732 |
| IV* | | | | | | | | | | | | | | | | | | |
| 50 | 152 | 233 | 330 | 491 | 764 | 1081 | 1956 | 3141 | 4503 | 6012 | 8103 | 10577 | 13461 | 20552 | 29575 | 34872 | 40727 | 51533 |
| 100 | 157 | 242 | 344 | 513 | 807 | 1143 | 2095 | 3401 | 4878 | 6440 | 8760 | 11533 | 14794 | 22912 | 33385 | 39591 | 46487 | 58823 |
| 150 | 163 | 257 | 366 | 547 | 873 | 1237 | 2304 | 3792 | 5441 | 7038 | 9680 | 12872 | 16663 | 26226 | 38744 | 46229 | 54593 ⁽¹⁾ | 69083 |
| 200 | 171 | 275 | 394 | 591 | 959 | 1362 | 2582 | 4313 | 6191 | | | | | | | | | |
| 230 | 175 | 285 | 408 | 613 | 1003 | 1425 | 2721 | 4574 | 6567 | | | | | | | | | |
| 50 (U/C) | 91 | 140 | 198 | 295 | 458 | 648 | 1174 | 1884 | 2702 | 3607 | 4862 | 6346 | 8076 | 12331 | 17745 | 20923 | 24436 | 30920 |

* Application I, II, III, IV

NOTES:

50 U/C refers to reduced diameter disc option.

(1) Duplex shaft not suitable for these conditions, use only 431 stainless steel or super duplex.

KEYSTONE SERIES GR RESILIENT SEATED BUTTERFLY VALVES

GRW/GRL

MAXIMUM ALLOWABLE SHAFT TORQUES (in lbs)

| Shaft material | Valve size (NPS) | | | | | | | | | | | | | | | | | |
|----------------|------------------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|
| | 2 | 2.5 | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 24 | 28 | 30 | 32 | 36 |
| 316SS | 575 | 975 | 975 | 1415 | 2300 | 2300 | 3360 | 6740 | 6740 | | | | | | | | | |
| 431SS | 800 | 1370 | 1370 | 2035 | 3230 | 3230 | 5750 | 11570 | 11570 | 13650 | 16140 | 26350 | 29490 | 45010 | 55860 | 63100 | 62750 | 130500 |
| Duplex | | | | | | | | | | 10230 | 12110 | 19760 | 21370 | 33770 | 41900 | 47300 | 47050 | 97900 |
| Super duplex | 750 | 1260 | 1260 | 1860 | 3010 | 3010 | 5310 | 10620 | 10620 | 12510 | 14800 | 24150 | 26115 | 38640 | 47950 | 54150 | 53850 | 112000 |

FLOWRATE CO-EFFICIENTS - C_v VALUES

| Valve size (NPS) | Disc opening (degrees) | | | | | | | | | |
|------------------|------------------------|------|------|------|-------|-------|-------|-------|-------|--|
| | 10° | 20° | 30° | 40° | 50° | 60° | 70° | 80° | 90° | |
| 2 | 0 | 1.0 | 6 | 16 | 35 | 54 | 83 | 114 | 125 | |
| 2.5 | 0 | 2.8 | 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 | 450 | 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 | |
| 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 | |
| 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 | |

NOTE:

C_v = The volume of water in U.S.gpm that will pass through a valve with a pressure drop of 1 psi at 70°F.

PRESSURE-TEMPERATURE DIAGRAM

| Seat material* | Disc material | Body material | Size range (NPS) | Valve function Standard / End of Line | Temperature (°F) | | | | | | | | | | | | | |
|-------------------|---------------|---------------|------------------|---------------------------------------|------------------|---|----|-----|-----|-----|-----|-----|-----|--|--|--|--|--|
| | | | | | -20 | 0 | 32 | 122 | 212 | 248 | 266 | 302 | 320 | | | | | |
| EPDM | all | DI | 2-12 | Std / EOL | | | | | | | | | | | | | | |
| NBR and white NBR | all | DI | 2-12 | Std / EOL | | | | | | | | | | | | | | |
| FKM | all | DI | 2-12 | Std / EOL | | | | | | | | | | | | | | |
| EPDM | all | DI | 14-36 | Std / EOL | | | | | | | | | | | | | | |
| NBR | all | DI | 14-36 | Std / EOL | | | | | | | | | | | | | | |
| FKM | all | DI | 14-36 | Std / EOL | | | | | | | | | | | | | | |

NOTES:

* all seat materials drop tight

For non-PED requirements with EPDM seats, valves can be rated to a minimum temperature of -40°F.

KEYSTONE SERIES GR RESILIENT SEATED BUTTERFLY VALVES

GRW/GRL

ORDERING INFORMATION

| Example: | | GR | L | 4 | D | 1 | 2 | E | A1 | K | B0 | UC | | |
|---|--|----|----|----------------|----|-----|-------------------------|---|----|-----------|----|-----|-------------------------|--|
| Series | | | | | | | | | | | | | | |
| GR | | | | | | | | | | | | | | |
| Body style | | | | | | | | | | | | | | |
| L | Lug | | | | | | | | | | | | | |
| W | Wafer | | | | | | | | | | | | | |
| Size (NPS) | | | | | | | | | | | | | | |
| 2 | 4 | 8 | 14 | 20 | 30 | | | | | | | | | |
| 2.5 | 5 | 10 | 16 | 24 | 32 | | | | | | | | | |
| 3 | 6 | 12 | 18 | 28 | 36 | | | | | | | | | |
| Body material | | | | | | | | | | | | | | |
| D | Ductile iron ASTM A536 | | | | | | | | | | | | | |
| N | Ductile iron ASTM A395 | | | | | | | | | | | | | |
| Disc material | | | | | | | | | | | | | | |
| 1 | 316 stainless steel | | | | | 6 | Duplex | | | | | | | |
| 2 | 304 stainless steel | | | | | 7 | Super duplex | | | | | | | |
| 3 | Aluminum bronze | | | | | N | Nickel aluminium bronze | | | | | | | |
| 4 | Ductile iron / ENP (NPS 2-12) | | | | | W | Ductile Iron/Nylon ctd. | | | | | | | |
| 5 | Ductile iron / Epoxy ctd. (NPS 14-36) | | | | | | | | | | | | | |
| Shaft ^(1,2) | | | | | | | | | | | | | | |
| 1 | 316 stainless steel | | | | | 6 | Duplex | | | | | | | |
| 2 | 431 stainless steel | | | | | 7 | Super duplex | | | | | | | |
| Notes: | | | | | | | | | | | | | | |
| (1) The standard material is 431 stainless steel. 316 stainless steel shaft is available as an option in NPS 2-12. | | | | | | | | | | | | | | |
| (2) NPS 14-36 valves with a super duplex disc will have a super duplex disc screw. All other disc materials will have a duplex disc screw. | | | | | | | | | | | | | | |
| Seat | | | | | | | | | | | | | | |
| E | EPDM (Food grade, ACS) | | | | | N | NBR (Food grade) | | | | | | | |
| E1 | EPDM (KIWA, WRAS, ACS) | | | | | N1 | NBR (DVGW-G) | | | | | | | |
| F | Fluoroelastomer (FKM) | | | | | W | White NBR (Food grade) | | | | | | | |
| Flange drilling | | | | | | | | | | | | | | |
| Single drilled | | | | | | | | | | | | | | |
| A1 | ASME 125/150 | | AE | AS2129 Table E | | D1 | DIN PN 6 | | D3 | DIN PN 16 | | | | |
| AD | AS4087 PN 16 | | B1 | BS Table E | | D2 | DIN PN 10 | | J2 | JIS 10K | | | | |
| Multidrilled (Wafer only) | | | | | | | | | | | | | | |
| M3 | ASME 125/150, AS2129 Table E (NPS 2-24) | | | | | | | | | | | | | |
| Mounting | | | | | | | | | | | | | | |
| K | Keystone actuator mount | | | | | | | | | | | | | |
| Actuation | | | | | | | | | | | | | | |
| B0 | Bare shaft | | G1 | Gear | | P1 | Pneumatic DA | | E | Electric | | | | |
| H1 | 10 pos handle | | C1 | Chainwheel | | P2 | Pneumatic SR | | | | | | | |
| Special (If none leave blank) | | | | | | | | | | | | | | |
| UC | Under cut disc for 50 psi or less pressure | | | | | P | Special body coating | | | | | MTR | Material certifications | |
| SF | Silicone free | | | | | DOC | Special documentation | | | | | | | |



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