

Butterfly and Rotary Process Valves Overview

KEYSTONE
vanessa



Tyco Flow Control brings together several of the world's premier brands of butterfly valves and controls developed for process industries. We offer a level of expertise that is second-to-none, in providing flow control solutions to a variety of industries including HVAC, oil and gas, chemical, petrochemical, food and beverage, pulp and paper, and power generation.

Tyco Flow Control's extensive know-how is available to our customers through a global network of sales centers. These sales centers are able to process sales requests quickly and efficiently, providing customers with a single source for Total Flow Control Solutions™.

Resilient Seated Butterfly Valves

Process Valves

Keystone Figure 990/920/999/992 (Thin Profile Disc Design)

These valves are used when sanitary service, corrosion or erosion resistance is required in isolation or control valve applications. Common high performance applications are found in the food and beverage, pharmaceutical, pulp and paper, mining and power industries.

- One-piece, thin profile, disc-stem provides minimum obstruction to flow resulting in highest C_v , lowest pressure drops and best control characteristics.
- One-piece disc-stem is available in 316 stainless steel, polymer or elastomer molding.
- Triple-function seat provides bi-directional drop-tight shutoff, isolates the valve body and stem from the line media and also serves as the flange seal.
- Dovetail seat retention allows convenient and economical seat replacement.

Size Range: Figure 990 (wafer style) 1" to 20"
Figure 920 (lug style) 2" to 20"

Pressure Ratings: 1" to 12" Metal Disc-Stem – 150 psi
2" to 12" Molded Disc-Stem – 100 psi
14" to 20" Metal or Molded Disc-Stem – 75 psi

Flange Standard: ASME 125/150

Request Data Sheet: KEYMC-0027-US



Keystone Series 60 (Cartridge Seat Design)

Ideally suited for many high performance applications, including vacuum, sanitary, corrosive, and erosive environments found in the chemical, mining, pulp and paper, oil and gas, food and beverage, and power markets.

- Cartridge style seat provides high pressure, as well as full vacuum capability.
- Disc is available in a variety of metals and elastomer coated.
- Blowout resistant stem retention design is standard.
- Lug style is unidirectional, full rated dead-end service (2" to 24").

Size Range: 2" to 24" (wafer and lug style)

Pressure Ratings: 2" to 12" – 250 psi
14" to 24" – 200 psi

Flange Standard: ASME 125/150

Request Data Sheet: KEYMC-0026-US



Resilient Seated Butterfly Valves

General Purpose Valves

Keystone Figure AR1/AR2 (General Purpose)



Designed for many general valve applications, such as liquid and gas transmission for isolation and control in cooling systems, water treatment, chemical, mining, food and beverage as well as bulk handling.

- One-piece body with extended neck allows clearance for flanges and insulation.
- Triple-function-seat provides bi-directional drop-tight shutoff, isolates the valve body and stem from the line media and also serves as the flange seal.
- Dovetail seat retention allows convenient and economical seat replacement.
- Polished disc edge provides extended cycle life.

Size Range: Figure AR1 (wafer style) 2" to 36"
Figure AR2 (lug style) 2" to 24"

Pressure Ratings: 2" to 12" – 175 psi
14" to 36" – 150 psi

Flange Standard: ASME 125/150

Request Data Sheet: KEYMC-0025-US

Keystone Series 61 (Nylon Coated Disc)



These valves are ideally suited for any service where tight shutoff with maximum flow area is required.

- Field-replaceable seat fully isolates the body and stem from flow.
- Thin disc design provides minimum obstruction of the flow, resulting in smooth flow characteristics.
- Ductile Iron (ASTM A536) body is standard.
- Available in nylon coated Ductile Iron and Super Duplex discs.

Size Range: 2" to 24" (wafer and lug style)

Pressure Ratings: 2" to 12" – 235 psi
14" to 24" – 150 psi

Flange Standard: ASME 125/150

*Request Data Sheet: KEYMC-0260-US (2" to 12")
KEYMC-0277-US (14" to 24")*

Commercial Construction Valves

Keystone Figure 221/222 (Molded Seat Design)



This product is designed to meet the demands of applications that require high pressure and bi-directional dead-end service.

- Injection molded seat provides bubble-tight shutoff to 250 psi.
- Lug style is full rated 250 psi dead-end service.
- Round polished disc edge provides concentric sealing, reduced torque and longer seat life.

Size Range: 2" to 12"

Pressure Rating: 250 psi

Flange Standard: ASME 125/150

Request Data Sheet: KEYMC-0029-US

Resilient Seated Butterfly Valves

Large Diameter Valves

Keystone Figure 106 (Double Flange)

This valve is used in many applications where large diameter valves are necessary, in such industries as water transmission, chemical, mining, pulp and paper, pharmaceutical and power. The body design is a double flange.

- The disc is available in a variety of metals including elastomer molded.
- Triple-function seat provides bi-directional drop-tight shutoff, isolates the valve body and stem from the line media and also serves as the flange seal.
- Dovetail seat retention allows convenient and economical seat replacement.

Size Range: 24" to 48" (double flange)

Pressure Rating: 150 psi

Flange Standard: ASME 125/150

Request Data Sheet: KEYMC-0028-US



Keystone Dubex - RMI (Triple Offset and AWWA C504)

Dubex - RMI AWWA Butterfly Valve

The double-flanged, triple eccentric, resilient-seated valve design is essential for applications in the water industry.

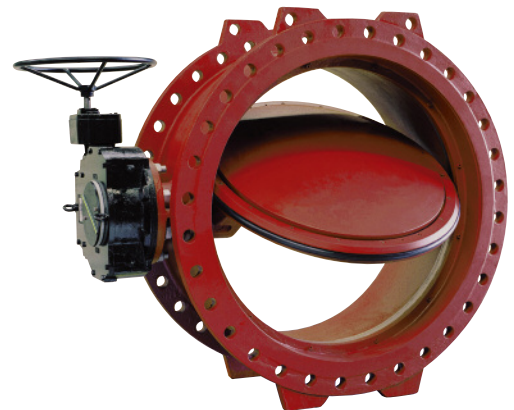
- Virtually no rubbing from the resilient seal on the seating surface. This enhances the life expectancy of the valve.
- Torque closing: greater torque results in improved tightness.
- Resilient seal firmly integrated in disc for tight shutoff performance.
- In-line replaceable and readjustable resilient disc seal.
- Face-to-face:
 - According AWWA C504-06 short.
 - Above 72": manufacturer standard.
 - Alternative face-to-face dimensions on request.
- Performance testing in compliance with AWWA C504 requirements.
- Vibration-proof disc pins installed perpendicular on the flow direction.
- Axial bottom shaft bearing carrying the disc weight when installed with shaft in vertical position and ensuring accurate centering of the disc assembly.

Size Range: 6" to 160"

Pressure Ratings: 6" up to 48" – 350 psi
up to 86" – 250 psi
up to 120" – 150 psi
above 120" – contact your sales representative

Drilling: 6" to 72" – ASME B16.1
above 72" – AWWA C207, Class D

Request Data Sheet: RMISB-0018-US



120" Valve

Lined Butterfly Valves

NeoTecha NeoSeal



A fully lined solution, according to ISO 5752/5 short (EN 558-1/T5), with a wide variety of corrosion resistant disc and liner materials to handle the most demanding customer applications.

- Stem seal, the pressure to keep the two sealing surfaces together is provided by an upper and lower set of Belleville springs resulting in a superior stem seal, which is TA-Luft approved.
- Bubble tight shut-off in both directions, in accordance with EN-12266-1 leak rate A (UHMWPE leak rate B).

Size Range: 1 1/2" to 36"

Pressure Ratings: 1 1/2" to 24" (150 psi)
28", 32" and 36" (87 psi)
30" (36 psi)

Temperature: -40°F to 392°F

Flange Accommodation: DIN PN 10/(16)
ANSI 150, JIS 10K

Request Data Sheet: NEOJV-0003-US

Sanitary Products

Keystone Figure 250 and 251, Stainless Steel Hygienic



A universal valve for isolation and control in the food, dairy, brewing, pharmaceutical, beverage and chemical industries. The F250 (Imperial) and the F251 (Metric) Sanitary butterfly valves are designed to be easily automated with any quarter-turn actuation package or with our F257 vertical actuators.

- Combination dual or multi-positioned notch plate on manual valves.
- Integral disc position indicator on lower shaft.
- USDA approved powder handling option.
- F257-065, -100, -140 vertical stainless steel actuators.
- Field repairable (100 and 140 only).
- Retained spring for safety.
- Modular mounting kits – body bolts not used for brackets.
- High visibility position indicator.
- Proximity switch feedback.

Size Range: 1" to 6"

Flange Connection: Clamp connection, butt weld, wafer style

Pressure Ratings: Max Pressure @ 68°F [20°C]
150 psi

Recommended Working Pressure @ 68°F [20°C]
600kPa (6 bar) 90 psi

Min Pressure @ 68°F [20°C] Full Vacuum

Temperature Range: 14°F to 203°F [-10°C to 95°C]

Request Data Sheet: F250/F251

High Performance Butterfly Valve

The K-LOK is an ASME Class product, providing services in ASME 150 and 300 ratings. The K-LOK valve is a double offset disc that utilizes a true interference seat design. This allows for increased valve performance and wear while delivering a Class VI shutoff with a polymer seat. The K-LOK can provide shutoff from vacuum to the ASME pressure rating without modifications and is available with soft seat, metal seat or API 607 4th Edition certified firesafe seat.

Keystone Figure 360/362 and Figure 370/372

- Integrally cast mounting pad provides direct mounting of many actuators.
- Rocker-shaped gland bridge compensates for uneven adjustment of gland nuts.
- Disc taper pins are tangentially positioned half in disc and half in stem, placing them in compression rather than shear, which helps eliminate potential for failure.
- Optional bi-directional end-of-line service available.
- Standard materials of construction include carbon steel and 316 stainless steel. Other alloys available as options.
- This K-LOK design is available for firesafe services and is API 607 4th Edition approved by third-party witness.

Size Range: 2" to 36"

Pressure Ratings: 285 psi and 740 psi

Temperature Rating: -20°F to 1000°F

Flange Standard: ASME 150 and 300

Request Data Sheet: KEYMC-0032-US



Keystone Figure 310/312

- Heavy duty circular key holds the seat and retaining ring in place, providing bi-directional, end-of-line service at full-rated pressure.
- Uninterrupted gasket surfaces help eliminate problems associated with seat retaining screws in the gasket surface, allowing the use of standard spiral wound gaskets.
- Unique interference seat design with energized elastomer O-ring allows bi-directional Class VI shutoff at lower pressures. The seat is further energized by line pressure, providing the same tight bi-directional shutoff at full-rated pressure.
- The seat retainer ring is housed within the flange gasket ID to eliminate potential emission path.

Size Range: 2" to 12"

Pressure Rating: 285 psi

Temperature Rating: -20°F to 350°F

Flange Standard: ASME 150

Request Data Sheet: KEYMC-0031-US



Rotary Process Valves

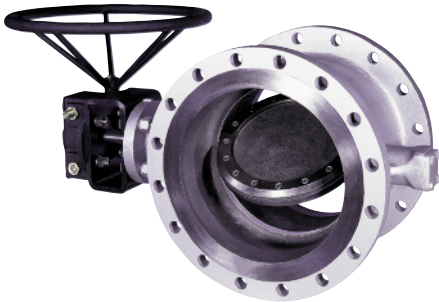
The undisputed leader in triple offset valve technology, Vanessa offers the ultimate performance in a large range of materials, sizes, classes, temperatures and applications. The non-rubbing triple offset design, in combination with the resilient metal seal ring, helps ensure zero leakage performance over the highest possible valve cycle life.

Vanessa Series 30,000 QTF, QTG, QTL and QTW

Triple Offset, Metal Seated, Bi-Directional Zero Leakage for Critical Service



QTF Double Flange



QTG Double Flange



QTL Lug Style

- Torque-generated resilient metal seal ring helps provide zero leakage performance.
- Torque-seating action ensures continuous bi-directional, zero leakage performance.
- Quarter-turn, non-rubbing design achieved by a unique, triple offset geometry eliminates all seat-to-seal rubbing throughout the valve's 90 degree rotation.
- All metal construction and inherently fire safe, certified per API 607 4th Edition.
- Single-piece cast body, and Stellite hardfaced integral seat permits broader applications, longer valve life and less maintenance.
- Standard long length hardened stainless bearings with bearing protectors provide the highest level of protection in dirty or polymeric applications.
- Standard externally retained, blowout-proof shaft is safer to operate and provides complete compliance to API 609.
- Standard integral position indicator on the shaft and top mounting flange ensure positive disc position identification.
- Double-flanged model QTF adheres to the face-to-face dimensional requirements of ISO 5752.
- Double-flanged model QTG adheres to the face-to-face dimensional requirements of ASME B16.10.
- Single-flanged lug model QTL and wafer model QTW both adhere to the face-to-face dimensional requirements of API 609.
- Standard carbon steel and stainless steel bills of material and many alloy bills of material are available upon request.

Size Range: 3" to 112"

Pressure Ratings: ASME Class 150, 300, 600 and 900

Flange Standard: ASME B16.5, ASME B16.47
Series A & B

Industries Served: Refining, chemical, petrochemical, pulp and paper, pharmaceutical, power, marine, steam distribution, specialty chemical, sugar processing and municipal water.

Request Data Sheet: VANLT-0005-US



QTW Wafer Style

Tyco Flow Control offers pneumatic actuators in double rack and pinion and scotch yoke styles, available in hard anodized aluminum, nickel impregnation or stainless steel. The actuators can be used in a wide range of applications with actuator torques available to meet the most demanding requirements. A complete line of electric actuators in single and multi-phase voltages for on/off or modulating services. The electric actuators can be used on most network protocols that utilize the latest technology.

Actuation

Pneumatic Actuators

Keystone Rack and Pinion Design

- Compact rack and pinion design, helps deliver maximum output torques in a small compact package.
- Full bearing support on every moving part for long life.
- 79U with encapsulated springs simplifies assembly and helps ensure safety and reliability.
- Unique spring design allows for easy adjustment in the field for different supply pressures.
- Hard anodized epoxy coated body for higher levels of corrosion resistance.
- Direct mounting to Keystone butterfly valves.

Supply Pressure: 40 to 120 psig

Output Torques: Double Acting – to 27,624 lb.in.
Spring Return – to 10,155 lb.in.

79U Request Data Sheet: KEYMC-0007-US

MRP Request Data Sheet: KEYMC-0153-US



79U



MRP

The Morin actuator products utilize a scotch yoke mechanism that provides highest torque outputs at each end of the actuator stroke, resulting in a torque characteristic that is typical to most quarter-turn valves.

Morin

Morin actuators are constructed of ductile iron housing and end caps, 17-4 stainless steel yoke, with either 316 stainless steel barrels for the Series B or steel barrels with Xylan® coating for the Series C. Morin Series S actuators are constructed of stainless steel, offering high levels of corrosion protection.

Morin offers both symmetrical and canted yoke designs to allow suiting the output torque profile to the valve for more efficient and economic operation.

- Scotch yoke design using precision bearings eliminates dead band in the yoke mechanism, providing the greatest torque output at the beginning and end of stroke.
- Teflon® piston bearings, bronze piston rod bushings and output shaft bushings of either bronze or Teflon® provide longer life, help reduce maintenance and require no lubrication.
- Choice of canted or symmetrical yoke design puts the torque where it's most needed.
- Bi-directional travel stops provide accurate valve rotation adjustment.



Series B



Series C

Series B and C

Supply Pressure: 40 to 160 psig

Output Torques: Double Acting: up to 1,374,700 lb. in.
Spring Return: up to 583,288 lb. in.

Series S

Supply Pressure: 40 to 160 psig

Output Torques: Double acting – to 240,000 lb.in.
Spring return – to 104,125 lb.in.

Request Data Sheet: Series B and C, MORMC-0023-US

Series S, MORMC-0024-US



Series S

Actuation

Hydraulic Actuators

Morin



Series HP

Morin scotch yoke actuators continue to meet customer needs by using a dependable corrosive resistance material. The HP takes the same proven technology but adapts it for use with high-pressure hydraulics. Morin also offers a complete line of accessories such as lockouts, ESD packages, overrides, and mounting hardware.

- Canted yoke models for torque seated valves requirements.

Hydraulic Supply Pressure: 1500 psig

Output Torques: up to 240,000 lb.in.

Temperature Range: -22°F to 212°F

Request Data Sheet: MORMC-0072-US

Electric Actuators

Keystone EPI₂



The Keystone EPI₂ series is the most innovative all-in-one actuator solution for the automation of quarter-turn valves and dampers. With a large number of standard features included in a small, compact design, this series of electric actuators simplifies valve, actuator and control system integration. Available with both weatherproof and explosionproof environmental ratings. The unique epicyclical gear train helps eliminate the need for mechanical/electrical brakes and handwheel clutch mechanisms. The EPI₂ direct mounts to most Tyco-manufactured valves, eliminating the need for expensive mounting brackets. The EPI₂ can be tailored to fit customer requirements with the addition of options such as servo controls, feedback modules, network cards and local pushbutton station. This flexibility gives customers the ability to meet many of their quarter-turn electric actuator needs with a single actuator line.

Torque Range: 600 to 17,700 lb.in.

Universal Voltage Supply: 24 to 240 Volt, AC or DC

Environmental Rating:

Standard Weatherproof: NEMA 4/4X/6 (IP66/68) + CSA 139 (CUS) Optional – UL 873

Hazardous Environments: FM/CSA Approved for NEC 500 (Class I, Div. 2) and NEC 505 (Class I, Zone 1 and 2) + NEMA 4/4X/6 (IP66/68)

Request Data Sheet: KEYMC-0275-US

Biffi ICON



ICON 2000



ELGA

WGR

- ICON multi-turn electric actuators with non-intrusive calibration, interrogation or operation via the local pushbuttons, a digital bus system, or a hand held device.
- Standard local controls with three position selector switch, open-stop-close push buttons and three LED indicator lamps.
- Two back-lit LED displays, one for position indication, the other for text messages.
- Self-diagnostics via an array of sensors. Simplifies field troubleshooting.
- Other standard features include a cycle timer, monitor relay, phase protection/correction, data logger and ESD relay.
- 40 digital I/O (inputs/outputs) for control, diagnostics, and status.

Output Torques:

Top-mount multi-turn: up to 12,744 in. lb. (1,062 ft. lb.)

Side-mount multi-turn: up to 408,000 in. lb. (34,000 ft. lb.)

Side-mount quarter-turn: up to 4.4 million in. lb. (366,667 ft. lb.)

Electric Fail Safe quarter-turn: up to 40,000 in. lb. spring end torque (3,333 ft. lb.)

Request Data Sheet: BIFMC-0477

Controls

Westlock Controls

Digital EPIC Position and Control Transmitters

D410/D420, Position Transmitters, Explosionproof

D430/D431/D450/D451, Control Transmitters, Non-incendive

D460/D470, Control Transmitters, Explosionproof

The EPIC Position Transmitter is a “smart” device with microprocessor-based intelligence providing both 4-20 mA signal for position and digital communications via the HART® and FOUNDATION Fieldbus™ protocols. The Emergency Shut Down/Partial Stroke Testing (ESD/PST) option provides for a discrete output via the Safety Information System (SIS) to control an ESD solenoid with integrated partial stroke test functionality; PST time, configurable PST stroke duration, time/date stamp of test and PST stroke timeout alarm. PST tests can be initiated via HART®, external trigger zones or internal push button. Unlike conventional position transmitters, the EPIC senses valve position without the need for linkages, levers, or rotary and linear seals. Position sensing is performed by non-contacting means via the use of an integrated Hall Effect sensor and magnet assembly.

Quantum Rotary Control Monitors*

764/784/864, Weathertight

765/789/865, Non-incendive

711/722/811, Intrinsically Safe

777/877/360, Explosionproof

Quantum products offer a fully integrated solution for the monitoring and control of process valves. Combining sensors, Falcon low-powered solenoids, junction housings and a local visual position indicator in one compact unit suitable for weatherproof and hazardous location service, Westlock offers an extremely efficient and cost effective method for the monitoring and controlling of rotary and linear valves.

AccuTrak™ Rotary and Linear Position Monitors*

1040/2004 and 9358/9044, Rotary Position Monitors, Weathertight

K-Switch, 9468, Rotary Position Monitor, Non-incendive

5004/5044 and 5050, Rotary Position Monitors, Intrinsically Safe

360, 2007 and 9479, Rotary Position Monitors, Explosionproof

3479 MOD3 and 9881, Linear Position Monitors, Explosionproof

316 Silver Bullet, Linear Position Sensor, All Classes and Groups

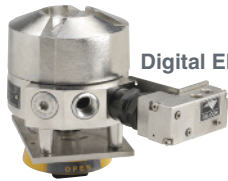
The AccuTrak™ family of products offers an integrated solution for the monitoring of process valves. By combining sensors, junction housings and local visual position indication in one compact unit suitable for weatherproof and hazardous location service, Westlock offers an extremely efficient and cost effective method of both monitoring and controlling linear and rotary valves.

* **Stainless Steel, AccuTrak, Quantum, Intellis Network Solutions and Positioners** - please consult your sales representative for the availability of global certifications such as ATEX, IEC, GOST, CSA and InMetro for specific configurations in these product lines, as approvals may vary.





AccuTrak/
Quantum 366



Digital EPIC D470



Digital EPIC D450



ICOT 5200



K10 EaziCal



793

Stainless Steel Control Monitors and Transmitters*

AccuTrak/Quantum 366, Stainless Steel Control Monitor, Explosionproof

Digital EPIC D450, Control Transmitter, Non-incendive

Digital EPIC D470, Control Transmitter, Explosionproof

Touch set cams in all control monitors are hand adjustable, spring-loaded and self-locking providing quick calibration of position sensors. Terminal strips are pre-wired and color coded with generous working space for ease of use and extra wiring points for solenoid integration. All units are standard with multiple conduits for easy field wiring and accessory mounting. All AccuTrak™ and Quantum™ products utilize common bolt pattern for mounting to actuators and can be supplied with mounting hardware as needed. Low copper content aluminum enclosures (0.2% maximum copper content) ensure robust performance in corrosive environments. Control transmitters utilize non-contact Hall Effect sensing technology and digital position transmission via 4-20 mA signal. Transmitters are available with both HART® and FOUNDATION Fieldbus™ digital communication protocols.

Positioners*

ICoT 5200/5300, Intelligent SmartCal Positioners

ICoT 5400, FOUNDATION Fieldbus™ Positioner

K-10 EaziCal, Electro-Pneumatic Positioner

793, Pneumatic Positioners

Westlock Controls offers a variety of solutions for the precise positioning of rotary and linear pneumatic actuators. These positioners are suitable for use with either double acting or spring return actuators. Mounting options include the ModMount®, NAMUR standards (VDI/VDE 3845) or actuator special kits. These units also provide the simplest form of installation and calibration as standard, without the requirement for additional equipment. Positioners are available with both HART® and FOUNDATION Fieldbus™ digital communication protocols.

Network Solutions*

Intellis Network Solutions, Control Monitors; Network Accessories

Intellis is a family of industrial control field network control monitors which use embedded control systems to automate valves and link field I/O to the host PLC or DCS. Each monitor is assigned a unique address and accepts input/output signals from valve position sensors, solenoids and external alarm and control devices. Hall Effect sensors are utilized for valve position monitoring. Low-power Falcon solenoid valve provides integrated actuation control. Network interface module Pacs allow communication via a protocol of choice. Westlock Intellis network control monitors are available for linear or rotary applications in all area classifications.



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KEYSTONE

Butterfly Valves

Power (Nuclear)	Oil and Gas	Food and Beverage	Mining	Water	Pharmaceutical	Pulp and Paper	Petrochemical
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Resilient Seated

Process Valves	Size, inches	Pressure						
990 (wafer) Thin Profile Disc Design (1" to 20")	1 to 12	150 psi	✓	✓		✓	✓	
920 (lug) Thin Profile Disc Design (2" to 20")	14 to 20	75 psi						
60 (wafer and lug) Cartridge Seat Design	2 to 12 14 to 24	250 psi 200 psi	✓	✓	✓	✓		✓

General Purpose Valves

AR1 (wafer) General Purpose (2" to 36")	2 to 12	175 psi	✓		✓	✓	✓	
AR2 (lug) General Purpose (2" to 24")	14 to 36	150 psi						✓
61 (wafer and lug) Nylon Coated Disc	2 to 12 14 to 24	235 psi 150 psi	✓			✓	✓	

Commercial Construction

221 (wafer) and 222 (lug) Molded Seat Design	2 to 36	285 psi 740 psi				✓		
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Large Diameter

106 (Double Flange)	2 to 48	150 psi	✓			✓	✓	✓
	6 up to 48	350 psi						
	up to 86	250 psi						
Kestone Dubex - RMI AWWA Butterfly	up to 120 above 120	150 psi contact sales	✓			✓		

High Performance

360 (wafer) and 362 (lug) K-LOK Stainless	2 to 36	285 psi 740 psi	✓	✓	✓	✓		✓
370 (wafer) and 372 (lug) K-LOK Carbon	2 to 36	285 psi 740 psi	✓	✓		✓	✓	✓
310 (wafer) and 312 (lug) ANSI 150	2 to 12	285 psi	✓			✓		

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