



VALVES & CONTROLS



KEYSTONE, BIFFI, WESTLOCK CONTROLS BUTTERFLY VALVES OVERVIEW

MARCH 2015

BUTTERFLY VALVES OVERVIEW

Pentair Valves & Controls 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.

Pentair Valves & Controls'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 Figures 990, 920, 999 and 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 shut-off, 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



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



Resilient seated butterfly valves

General purpose valves

Keystone Series GRW and GRL

Available in a wafer style body (GRW) and lug style body (GRL) with face to face dimensions according to API 609. This valve is used in many applications such as air, water, and dry media .

- The body is provided as a standard in ductile iron.
- The disc is available in a variety of metals.
- The seat is field replaceable and fully isolates the body and shaft from the flow, providing a dry shaft design.
- Top and bottom shaft bearings provide optimized support and minimum friction which results in decreased torques.
- Rounded polished disc edge for high cycle life which equates to lower cost of ownership.
- Blow-out resistant shafts are standard for increased safety.

Size range: 2" to 36"
Pressure rating: 2" to 12" – 230 psi
14" to 36" – 150 psi
Flange standard: ASME Classes 125 and 150



Commercial construction valves

Keystone Figures 221 and 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 shut-off 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



Large diameter valves

Keystone Series GRF

A double flanged style body with face-to-face dimensions according to API 609 (24" to 48") and AWWA C504 (54" to 72"). This valve is used in many applications where large diameter valves are used, such as water transmission, chemical, mining, pulp & paper, dams, and power.

- The body is provided with a ductile iron as standard
- The disc is available in a variety of metals
- The seat is field replaceable and fully isolates the body and shaft from the flow, providing a dry shaft design
- Top and bottom shaft bearings provide optimized support and minimum friction which results in decreased torques
- Rounded polished disc edge for high cycle life which equates to lower cost of ownership
- Blow-out resistant shafts are standard for increased safety

Size range: 24" to 72" (double flange style)
Pressure rating: 150 psi
Flange standard: ASME Classes 125 and 150



Resilient seated butterfly valves

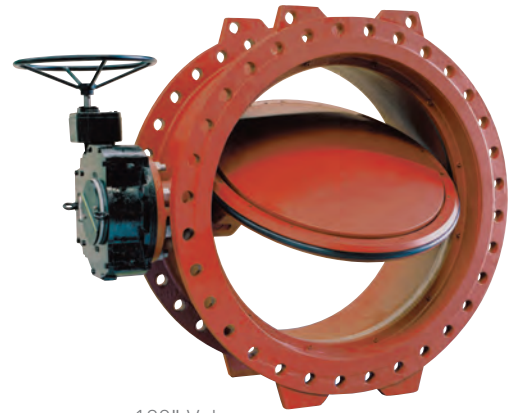
Large diameter valves

Keystone Dubex RMI double flanged butterfly valve

Tripple eccentric design allows for virtually no rubbing of the resilient seal on the seating surface. This extends the life expectancy of the valve.

- Torque closing: greater torque results in improved tightness.
- In-line replaceable and readjustable resilient disc seal.
- Face-to-face:
 - According AWWA C504-06 short.
 - Above 72": manufacturer standard.
- 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 rating:	6" to 48" (350 psi); Up to 86" (250 psi); Up to 120" (150 psi)
Drilling:	6" to 72" – ASME B16.1; Above 72" – AWWA C207, Class D



120" Valve

High performance butterfly valve

Keystone K-LOK

- 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 eliminates potential for failure.
- Lug style valves are modified for full raled bi-directional dead end service as standard.
- Standard materials of construction include carbon steel and 316 stainless steel. Other alloys available as options.
- This K-LOK design is available for fire-safe 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



Lined butterfly valves

NeoTecha NeoSeal

A fully lined solution 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



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.
- Spring return actuators incorporate “man-safe” designs that do not require special tools to disassemble.
- 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: up to 27,624 lb.in.
Spring return: up to 10,155 lb.in.



79U



MRP

Biffi

Biffi Morin Series B and C 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.

Biffi 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.
- 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: Up to 240,000 lb.in.
Spring return: Up to 145,775 lb.in.



Series S

* Note: Morin rebranded as Biffi in 2015.

Actuation

Hydraulic actuators

Biffi

Morin Series HP actuators are constructed of ductile iron housing and end caps, 17-4PH stainless steel or ductile iron yoke with steel barrels with Xylan® coating.

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.
- Bi-directional travel stops provide accurate valve rotation adjustment.
- Canted yoke models for torque seated valves requirements.

Hydraulic Supply Pressure: Up to 2250 psig

Output Torques: Double acting: Up to 1,092,000 lb.in.
Spring return: Up to 388,859 lb.in.

* Note: Morin rebranded as Biffi in 2015.



Electric Actuators

Keystone EPI-2

The Keystone EPI-2 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 epicyclic gear train helps eliminate the need for mechanical/electrical brakes and handwheel clutch mechanisms. The EPI-2 direct mounts to most Pentair-manufactured valves, eliminating the need for expensive mounting brackets. The EPI-2 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: Up to 17,700 lb. in.

Universal Voltage Supply: 100 to 240 Volt, AC or DC

Environmental Ratings: Standard Weatherproof:
NEMA 4/4X/6 (IP66/68) + CSA 139 (CUS)

Hazardous Environments:
FM/CSA Approved for NEC500 (Class I, Div.2) &
NEC 505 (Class I, Zone 1 & 2) + NEMA 4/4X/6
(IP66/68)



Actuation

Electric actuators

Biffi ICON

- ICON multi-turn electric actuators with non-intrusive calibration, interrogation and operation via the local pushbuttons, a digital bus system, or a hand held device.
- Standard local controls with pad-lockable, three position selector switch, open-stop-close pushbuttons 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, Partial Stroke & Test and ESD relay.
- 40 digital I/O (inputs/outputs) for control, diagnostics, and status.

Output Torques:

- Top-mount multi-turn: Up to 1,062 ft. lb.
- Side-mount multi-turn: Up to 34,000 ft. lb.
- Side-mount quarter-turn: Up to 4.4 million in. lb.
- Electric Fail Safe quarter-turn: Up to 40,000 in. lb. spring end torque



Controls

Westlock Controls

Westlock provides innovative solutions for the networking, monitoring and control of process valves. With millions of our conventional control monitors in service around the world and an installed base of over 100,000 valves networked using our Intellis products and network engineering services, we have application and field experience that are one of the best in the world.

Westlock manufactures a wide range of products for the monitoring and control of process valves. Our products have been developed using the latest technology and are intended to work seamlessly with both on/off and modulating valves and actuators to help improve both performance and safety. By anticipating the changing needs and requirements of the process industry our product range satisfies the latest international standards and approvals and is suitable for a wide array of process conditions. We have devices installed through out the world in the chemicals, oil & gas, pharmaceutical, food & beverage, power and paper industries.

Products offered:

- Digital EPIC Position and Control Transmitters
- Quantum Rotary Control Monitors
- AccuTrak™ Rotary and Linear Position Monitors
- Stainless Steel Control Monitors and Transmitters
- Positioners
- Network Solutions



D410



877



K10

KEYSTONE BUTTERFLY VALVES

			Power (Nuclear)	Oil and Gas	Food and Beverage	Mining	Water	Pharmaceutical	Pulp and Paper	Petrochemical
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										
GRW (wafer) General Purpose (2" to 36")	2 to 12	232 psi	✓		✓	✓	✓			✓
GRL (lug) General Purpose (2" to 36")	14 to 36	150 psi								
Commercial Construction										
221 (wafer) and 222 (lug) Molded Seat Design	2 to 12	250 psi					✓			
Large Diameter										
GRF (Double Flange)	2 to 48	150 psi	✓			✓	✓	✓		✓
Kestone Dubex - RMI Butterfly	6 up to 48	350 psi								
	up to 86	250 psi								
	up to 120	150 psi	✓				✓			
	above 120	contact sales								
High Performance										
K-LOK	2 to 36	285 psi 740 psi	✓	✓	✓	✓	✓		✓	✓



VALVES & CONTROLS

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