Butterfly Valve

TRIPLE OFFSET BUTTERFLY VALVES

The KINGER range of triple-offset butterfly valves has been specially designed and developed for heavy-duty applications requiring reliable metal-to-metal seat sealing.

This heavy-duty KINGER product range adopts the proven advantages of triple-offset butterfly-valve technology. As a standard feature, the valve provides bi-directional sealing. In addition, all valves are fitted with a lattiсed disc as standard to ensure low head-loss and stable flow performance under all operating conditions.

KINGER delivers high-integrity construction material options matched to each application requirement.
The standard construction is cast-steel body with fusion-bonded epoxy powder coating, together with stainless-steel 316 internal trim.
Upon request, valves can also be manufactured from a wide selection of special-alloy materials to suit demanding working conditions for most applications.

The KINGER triple-offset high-performance butterfly valve is available in standard sizes from DN50 up to DN1600, with pressure ratings PN16, PN25, PN40 and PN64.
Higher-pressure classes and larger nominal sizes are available upon special request.
Every KINGER product is supported by comprehensive technical support, sales assistance and after-sales service.

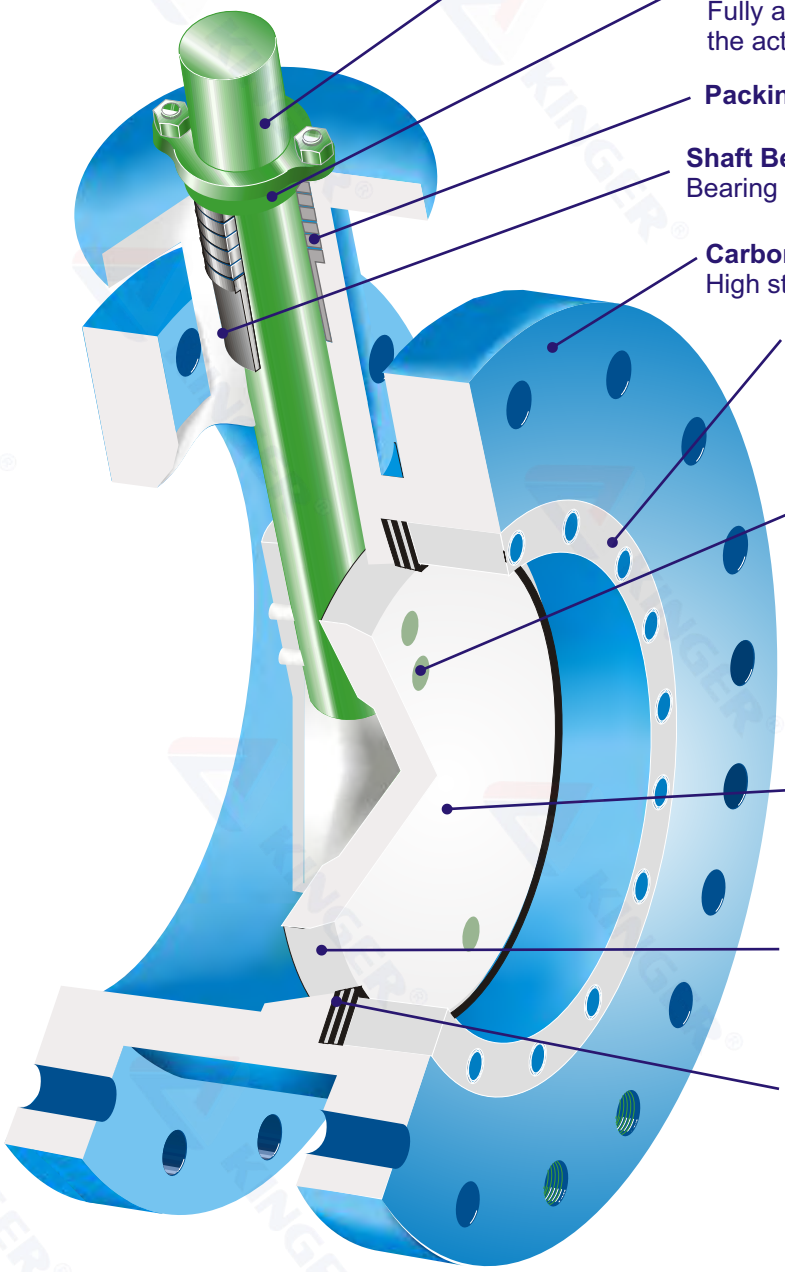


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MATERIALS OF CONSTRUCTION

KINGER is a range of Triple Offset Butterfly Valves designed and developed specifically for heavy duty application. The KINGER provides Bi-directional Metal to Metal sealing as standard. In addition, all valves are supplied as standard with a latticed disc to ensure low headloss and stable flow under all operating conditions.

Note:
Shaft sealing arrangement may vary according to design and Customer requirements



Shaft - S/Steel 316
Two stub shafts liberally sized to withstand all working conditions that the valves is subjected to.

Anti Blowout Packing Gland S/Steel 316
Fully adjustable without the need to remove the actuator

Packing - Graphite/ PTFE

Shaft Bearing - Bronze/Polymide/Graphite
Bearing has very low torque requirements

Carbon Steel A216 Gr. A216/ S/Steel 316
High strength, double flanged body design

Seal Retainer - S/Steel 316
Fully adjustable mechanical seat retainer can adjust or retain seat on site without the need for special tools.

Shaft Pins - S/Steel 316
Liberally sized high quality tapered pins to provide a reliable and strong connection

Shaft in addition, is keyed into housing

Disc - A216 Gr. A216/ S/Steel 316
Latticed design for low headloss characteristics and stability under all flow conditions.

Disc Edge - S/Steel 316 or Stellite
Specifically shaped to reduce seating torque and provide reliable service

Seal - Graphite/ S/Steel 316
One to four graphite layers carefully assembled between Stainless Steel rings and Graphite

Solid seal rings are available for abrasive services as well as high temperature applications.

Lower Bearing - Self Lubricating (not shown)
A two way adjustable bearing accurately set during assembly to centre the disc. The bearing assembly is permanently lubricated to ensure smooth operation.

Information subject to change without prior notice

PRINCIPLE OF OPERATION

The KINGER Triple Offset principle of operation is based on the perfect understanding and interrelationship of geometry in motion.

The Seal in the body and the Seat on the Disc are surfaces of a cone which is sectioned at an angle. The valve shaft is located slightly off centre and a little bit above the plane of the Seat. Its centre of rotation is also offset from the axis of the imaginary cone which extends from the surface of the Seat. When the valve is closed, the surface of the Seat and the Seal are in full contact at all points. Any effort to try to further close the Disc increases the sealing force and tightens the valve ensuring that the Seal is bi-directionally tight. Opening the valve, or rotating the Disc away from its Seal, results in the Seat camming away from the seal at all points. This action eliminates friction or sliding of the seating surfaces thus avoiding wear.

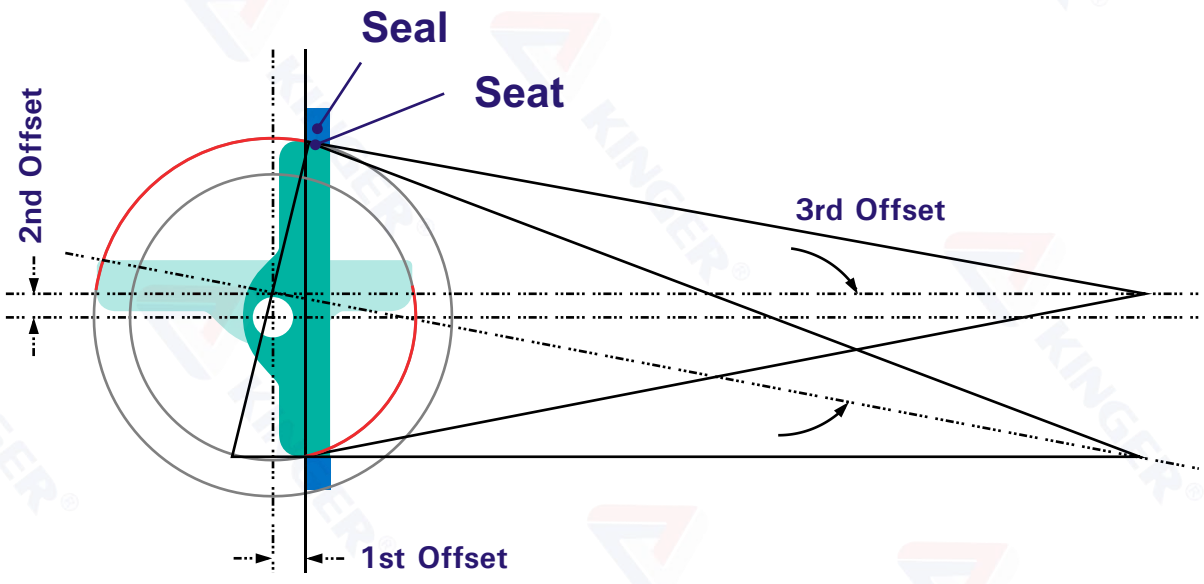
First Offset
The Sealing plane of the Disc is offset from the axis of rotation. This provides an uninterrupted circular sealing surface on the Disc.

Second Offset
The axis of rotation of the disc is laterally displaced from the true centre of the disc so that it will "cam" away from the seat to eliminate jamming or squeezing as the valve is opened and closed.

Third Offset
The third offset comes from the manner in which the Disc and body is machined. KINGER Triple Offset Design, the centreline of the cone is rotated away from the valve centreline resulting in an ellipsoidal profile.

With this geometry, Seat/Seal interference is completely eliminated ensuring long sealing life. The KINGER Triple Offset design Metal to Metal seated valve provide bubble-tight performance on all performance requirements including high temperature, high pressure and fire safe applications.

TRIPLE OFFSET



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Butterfly Valve

TRIPLE OFFSET BUTTERFLY VALVES

GENERAL SPECIFICATIONS

DESIGN TYPE
Triple Offset flanged, Bi-directional High Performance Butterfly Valve

ACCEPTABLE MEDIA
Water and Industrial Applications

OPERATING PRESSURE RANGE
PN10, PN16, PN25, PN40 & PN64

OPERATING TEMPERATURE RANGE
0°to 230°C

SIZE RANGE
DN100 to DN1600

MATERIALS OF CONSTRUCTION
Refer to Page 1

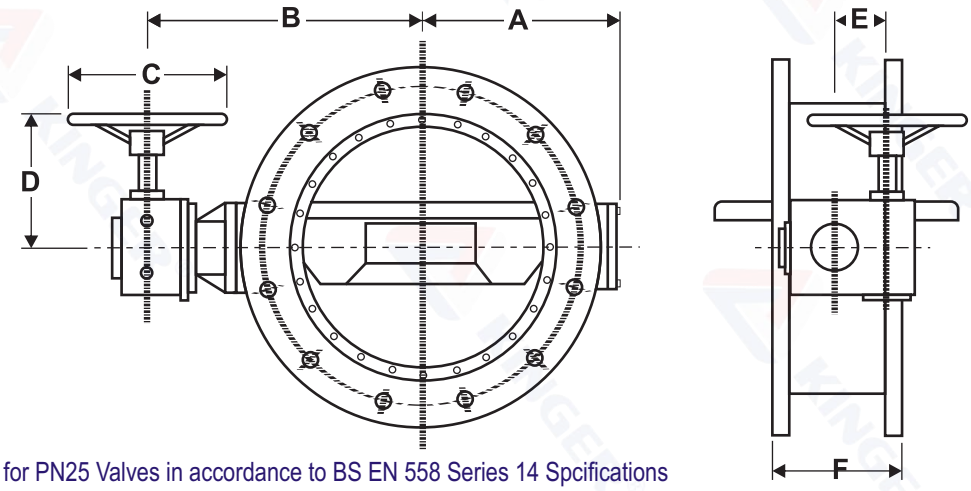
STANDARD FACTORY TESTS
Seat 1.1 x PN Body 1.5 times PN

END CONNECTIONS
SABS 1123, BS4504, ANSI B 16.1 & B16.5

DESIGN AND OPERATING OPTIONS
Electric or hydraulic actuation
Alternative materials of construction

APPLICABLE STANDARDS
BS 5155/ BS EN 593
BS EN 558 -1 Series 13 & 14 face to face dimensions

OVERALL DIMENSIONS



NOTE:
Weight given for PN25 Valves in accordance to BS EN 558 Series 14 Spcifications
Overall dimensions for larger sizes available on request.

DN	A	B	C	D	E	F series 13	F series 14	Weight kg
100	134	250	175	44	180	127	190	25
150	172	315	200	64	240	140	210	53
200	206	380	232	94	320	152	230	85
250	239	420	232	94	320	165	250	110
300	275	495	276	13	400	178	270	155
350	310	535	276	13	400	190	290	195
400	352	610	425	18	500	216	310	290
450	377	640	425	18	500	222	330	325
500	412	715	480	23	500	229	350	555
600	471	775	480	23	600	267	390	705
700	538	885	525	29	600	292	430	900
800	600	955	525	29	600	318	470	1350
900	675	1075	650	40	720	330	510	2040
1000	745	1175	640	40	720	410	550	2530

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WORM GEAR OPERATORS

General Valve Design

KINGER High Performance Triple Offset Butterfly valves provide tight shutoff, a long **Life Cycle**, and **Life Cycle Costs** that are lower than most alternatives. Technological innovations combined with its uncomplicated design make the KINGER Butterfly Valve design a dependable, economical and flexible solution to a variety of water and industrial flow shutoff and control needs.

KINGER s Triple Offset Design ensure exceptional performance and bubble-tight shutoff over a wide range of operating conditions.

KINGER valves are virtually maintenance free but, in the rare instance, where needed are easy to maintain and the design is such that seat inserts can be replaced on site and the valve can be put back into service immediately.

The KINGER Triple Offset design principle with careful focus on component design fit and the reduction of wear surfaces dramatically reduces torque requirements. Therefore, ensuring that the valves can be operated with smaller actuators.

KINGER valves are easily automated. Every valve is drilled and tapped to accept linkage for a broad range of actuators in accordance to ISO 5210 and therefore does not require any modifications to the valve to accept actuation.

Worm Gear Operators

KINGER offers a rugged, lightweight and efficient Worm Gear Operator design that ensures long maintenance free operation. Features include:

- A highly visible Indicator installed on the Worm Gear output to accurately indicate if the valve is open or closed. This is coupled with a standard worm gear indicator board giving dual display of the disc position at all times.
- The Gearbox is fitted with adjustable Limit Screws as standard for adjustment within ±5° at the Open or Closed position.
- The KINGER Worm Gear Operator can be operated by Handhweel or Captop or; Electric or Pneumatic Actuation and is supplied with Worm or Worm and Spur Gear Operators to facilitate the design and operating pressure requirements. The gearing design is such that the valve in the case of manual operation, can be operated by one person against Full Differential Pressure.
- The connecting flange of KINGER Worm Gear Operators are in accordance to ISO 5210 specifications.

WORM GEAR SELECTION TABLE

WORM GEAR MODEL No.	OUTPUT TORQUE (N.m)	APPLICABLE VALVE SIZE & PRESSURE RATING			
		PN10	PN16	PN25	PN40
KGR0#	160	DN100-DN150	DN100-DN150	DN100	DN100
KGR1#	400	DN200-DN250	DN200	DN150	DN150
KGR2#	1000	DN300-DN350	DN250-DN300	DN200-DN250	DN200
KGR3#	2400	DN400-DN500	DN350-DN450	DN300-DN350	DN250-DN300
KGR4#	5000	DN600-DN700	DN500-DN600	DN400-DN450	DN350-DN400
KGR5#	10000	DN800-DN900	DN700-DN800	DN500-DN600	DN450-DN500
KGR6#	20000	DN1000	DN900-DN1000	DN700-DN800	DN600
KGR7#	40000			DN900-DN1000	DN700-DN800

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INSTALLATION

Storage

Butterfly valves must be stored under cover and the seating and sealing arrangement should be protected against external damage.

Installation

KINGER recommends the use of an KINGER Dismantling Joint with every KIINGER Butterfly Valve supplied to ensure ease of installation and disassembly.

The KINGER design can be installed in either a horizontal or vertical position.

All KINGER Butterfly Valves provide Bi-Directional sealing as standard and can therefore be installed in either direction of flow.

The disc must be in the closed position when installing.

Flange bolts should be tightened crosswise.

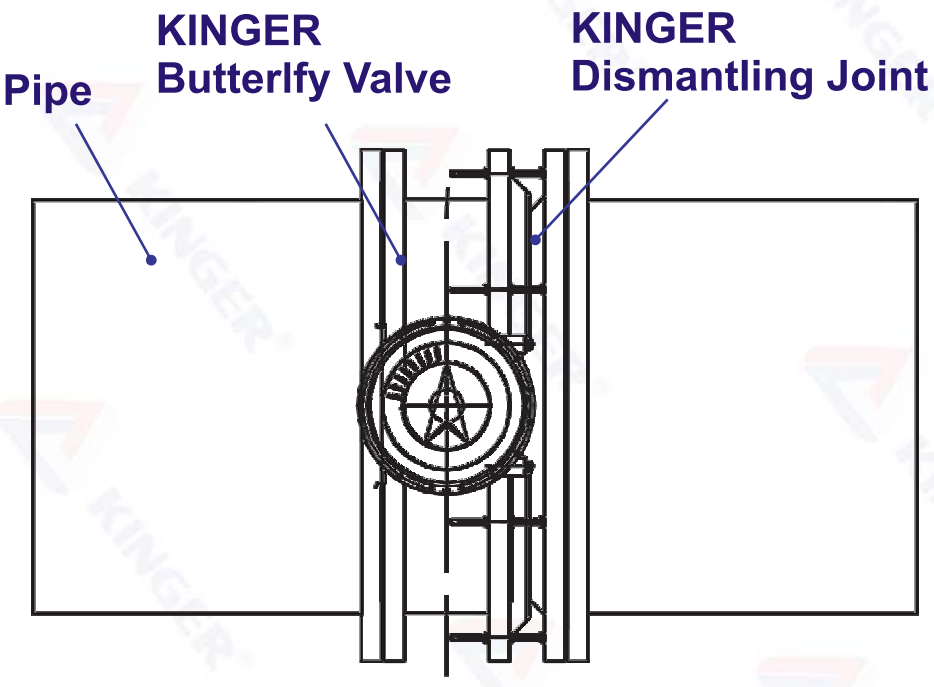
Operation

KINGER valves are supplied as standard with Worm or Worm/Spur Gears, sized to provide a sufficient torque for the operation of the valve at full working pressure by one person.

All valves are supplied with a Dual Position Indicator to ensure that the position of the valve can be viewed from all angles.

Maintenance

KINGER valves are virtually maintenance free, in the rare instance should the valve require a seal or seat replacement; replacement is straight forward and can be effected on site with minimum tool requirements.



WHY KINGER BUTTERFLY VALVES?

Shaft Design

The KINGER design utilises generously sized corrosion resistant two piece Stub Shaft design. Shafts are constructed in Stainless Steel 316 for protection against the harmful effects of corrosion. The design allows for operation in both horizontal as well as vertical installation.

The lower end Shaft is grooved and fitted with a Split Ring , prevent Shaft blowout. The Upper Shaft is designed with an integral Collar and blowout is prevented by the Gland Retainer

Bearings

Fine-machined and hardened bearings to reduce the Shaft friction and ensure low operating torque requirements.

Anti-Blowout Shaft

Disc and shaft in the KINGER design are connected together by generously sized Stainless Steel Taper Pins designed to transmit torques required and withstand stresses imposed under severe operating conditions.

The tamper-proof design not only meets but exceeds the requirements of ASME B16.34.

Lattice Disc Design

The KINGER Lattice Disc design provides the lowest pressure drop of all disc designs. In addition, the design provides flow stability under all operating conditions.

The Disc is designed to withstand the higher stresses associated with high pressure applications. A wide disc edge provides greater sealing area.

Sealing/Seating

KINGER provides a driptight Metal to Metal arrangements to suit most applications. Seals can be replaced in the field without the need for special tools.

Bi-Directional Sealing

Bi-directional sealing, zero leakage is achieved as standard in all KINGER design configurations by a unique principle in which the torque generated by the actuating mechanism is allowed to flex the Metal Seal within it's elastic limits, compressing the seal, thus ensuring that both Seal and Seat are perfectly matched. This Seal resiliency results in zero leakage.

Triple Offset Design

The KINGER Triple Offset valve's camming action of the Disc ensures that the Metal Seat and Metal Laminate Seal are never in contact with each other until the final shut off position is reached. The tilted cone angle of Seat and Seal combined with the ellipsoidal geometry allows the Seal to touch the Seat with a uniform contact angle therefore eliminating excessive wear and extending the life of the valve.

Materials of Construction

KINGER Triple Offset Butterfly Valves incorporate the highest integrity of materials of construction relative to application.

Operators

KINGER valves are supplied as standard with an actuator pillar in accordance to ISO 5211 specifications to allow for the installation of a variety of operator types.

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PURCHASE SPECIFICATIONS

General
All valves shall be of the tight-closing, Triple Offset, Bi-Directional Butterfly Valves design.

Valves shall be bubble-tight at the rated pressure in either direction, and shall be suitable for throttling service and/or operation after long periods of inactivity.

Valves shall be of the KINGER design.

Body
All valve bodies shall be double flanged and constructed in Carbon Steel A216 Gr. A216 or Stainless Steel 316. Flange alignment shall conform to PN10,PN16,PN25,PN40 and PN64 for SAB1123 or BS 4504 Standards.

Disc
Valve Discs shall be of the latticed design to provide a low head loss and stability under low flow conditions and shall be constructed in Ductile Iron to BSBN 500/7 or DN GGG 40 or 50 or Carbon Steel A216 Gr. A216 or Stainless Steel 316 Disc sealing edge shall be in Stainless 316 as standard or hardened Stellite for severe applications.

Shaft
Valves shall be of two Stub Shaft design in Stainless Steel 316. Shafts shall be keyed into their housing and shall fasten to the Valve Disc by means of threaded or smooth Disc Pins that provides a positive leak proof connection. The Upper and Lower Shaft design shall be of an Anti Blowout configuration in addition, The Upper Shaft shall have at least two Pins to secure it to the Disc.

Seat & Seal
The Seats shall be on the Disc edge and the Seal shall be in the valve body. Seals shall be of a Graphite and Stainless Steel 316 laminate design,designed to provide a positive, bi-directional seal regardless of operating conditions.

Seals shall be replaceable without the use of special tools or factory personnel.

Seals located on the valve Discs are not acceptable.

Bearings
Bearing shall be finely -machined and hardened (Nickel-plated) to reduce Shaft friction and cut down operating torque requirements. Bearings shall be designed for horizontal and/or vertical shaft loading.

Testing
All valves shall be hydraulic tested in with a Body test to 1.5 times nominal working pressure and a Seat test to 1.1 times nominal working pressure.

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ORDERING GUIDE

100 KINGER 25 S BF H

Size	DN100
Series	KINGER
Pressure Rating	PN25
Seat Configuration	Seat in Body
Coating	Fusion Bonded Epoxy Coating
Operator	Worm Gearbox
Operator Option	Handwheel

AVAILABLE OPTIONS

SIZE RANGE
DN100 to DN1600

PRESSURE RANGE
PN10 & PN16 - DN100 to Dn1600
PN25 - DN100 to DN1600
PN40 - DN100 to DN600

SEAT CONFIGURATION

Metal to Metal Seat	**MM**

OPERATOR

Worm Gear Gearbox	**W (Standard)**

OPERATOR OPTIONS

Handwheel	**H**
Captop	**C**
Electric	**E**
Pneumatic	**P**

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