SELLING SOLUTIONS

KINGER products and services cover a broad range of industry needs, offering a total solution approach to customers. Products include valves, pipes, couplings, fittings and other related products.

KINGER is focused on satisfying the demand for pipeline systems, which will consistently perform in the most economical way, year after year across their entire ***Life Cycle***.

To perform as required, a pipeline system must be designed and specified to resist corrosion, surge and waterhammer, and external loads. Further, pipeline materials must be sourced from reputable manufacturers and suppliers, handled and transported correctly and installed with due consideration of the pipe/ soil and pipe/component relationship.

KINGER ater services and products cover the entire spectrum of pipeline design, installation and operation ensuring that the most suited materials and complimentary components are selected relative to application, availability, initial cost and total cost of ownership.

WAFER RUBBER LINED BUTTERFLY VALVES

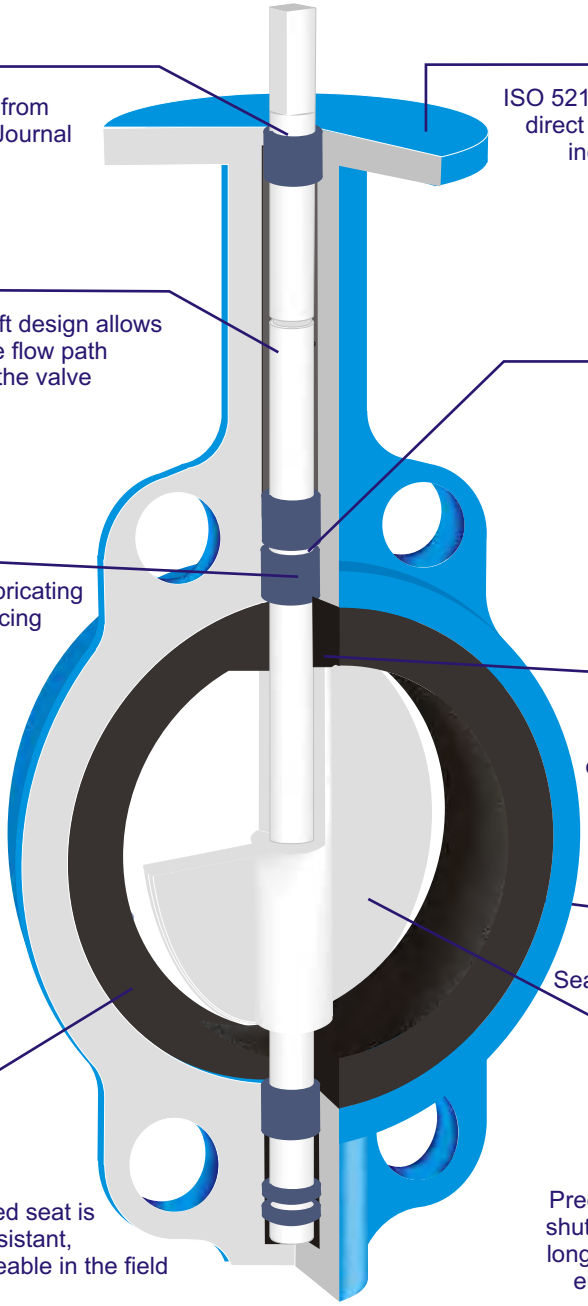
Kinger

WAFER RUBBER LINED BUTTERFLY VALVES

MATERIALS OF CONSTRUCTION

KINGER Wafer Rubberlined Butterfly Valves are a general purpose design for water and industrial applications. The liner is bonded to a rigid backing to eliminate seat distortion and reduce sealing torque. This feature also allows for the valve to be repaired in the field.

Benefits of the KINGER design are:



Dust Seal

Keeps dust and moisture from entering the upper Shaft Journal

Mounting Flange

ISO 5211 mounting flange accommodates direct mounting of all types of actuators, including levers, gear operators and electric or pneumatic actuators

Shaft

Either one or two stub shaft design allows the disc to "float" within the flow path increase the Life Cycle of the valve

O-Ring Seals

Provides further assurance against possible stem leakage

Shaft Bushing

Shaft Bearings are self lubricating and chemically inert, reducing operating torque

Hub Seal

Smooth finished discs flats mate with seat flats to give a highly efficient primary seal that prevents leakage into the shaft area

Seat Face

Seat to flange seal obviates the need flange gaskets

Seat

Phenolic/ Aluminum backed seat is non collapsible, stretch resistant, blow out proof and replaceable in the field

Disc

Precision profile provides bubble tight shut-off, assures minimum torque and longer seat life. Specific shape of disc ensures the least resistance to flow

WAFER RUBBER LINED BUTTERFLY VALVES

GENERAL SPECIFICATIONS

DESIGN TYPE
Wafer Pattern Rubber Lined Design

ACCEPTABLE APPLICATIONS
Water and Industrial Applications

OPERATING PRESSURE RANGE
PN 10/16

OPERATING TEMPERATURE RANGE
0° to 120°C

SIZE RANGE
DN50 to DN600

APPLICABLE STANDARDS
BS5155

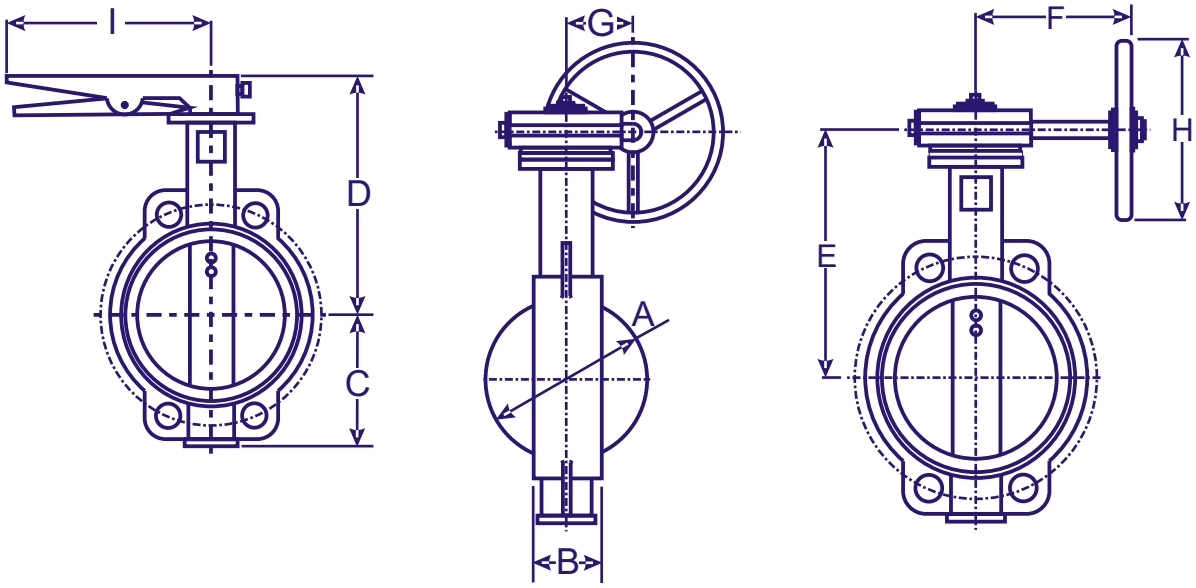
MATERIALS OF CONSTRUCTION
Body - Ductile Cast Iron - FBE Coated
Disc - Stainless Steel 316
Linings - EPDM

STANDARD FACTORY TESTS
Body 1.5 times PN

END CONNECTIONS
SABS 1123 Table 16, BS4504 PN16

DESIGN OPTIONS
Nickel Plated Ductile Iron Discs
Nitrile Liners
2 Stub Shafts
Pinned Shafts
Pinless Shafts

OVERALL DIMENSIONS



DN	A	B	C	D	E	F	G	H	I	Weight kg		BS4504/ SABS 1123
										With Lever	With Gearbox	
50	53	42	80	193	198	121	48	150	267	3	8.5	10/16
65	65	45	89	207	212	121	48	150	267	3.7	9.2	10/16
80	79	45	95	213	218	121	48	150	267	4.1	9.6	10/16
100	104	52	114	232	237	121	48	150	267	5.4	11	10/16
125	124	54	127	245	250	121	48	150	345	7.8	13	10/16
150	156	56	139	258	263	121	48	150	345	8.6	14	10/16
200	203	61	175	305	305	163	70	300	353	14	22	10/16
250	251	65	203	337	337	163	70	300	353	20	28	10/16
300	302	77	242	382	387	193	95	300	353	34	51	10/16
350	334	77	267	-	418	193	95	300	-	-	61	10/16
400	390	87	297	-	525	284	178	300	-	-	82	10/16
450	441	106	315	-	547	284	178	300	-	-	117	10/16
500	492	132	348	-	625	311	221	300	-	-	170	10/16
600	593	152	444	-	707	311	221	300	-	-	205	10/16

Note: DN450 to DN600 supplied with a 2 stage Worm Gear

HIGH PERFORMANCE DOUBLE OFFSET BUTTERFLY VALVES

Kinger

MATERIALS OF CONSTRUCTION

KINGER HIGH PERFORMANCE BUTTERFLY VALVES

KINGER is a range Double Offset High Performance Butterfly valves designed and developed specifically for the water industry.

The heavy duty KINGER product range was developed taking into account the best of double offset butterfly valve technology whilst overcoming the shortcomings inherent in some designs . This results in a product that provides bi-directional sealing as standard. In addition, the KINGER range is available with either a seal in body or seal in disc design. Further, all valves are supplied as standard with a latticed disc to ensure low headloss and stable flow under all operating conditions.

KINGER offers the highest integrity of materials of construction relative to application. Each valve is supplied in ductile iron, fusion bonded epoxy powder coated as standard with stainless steel 316 trim. Products in addition, can be supplied in a variety of exotic materials or totally rubber lined should the application dictate this form of protection.

The KINGER Double Offset High Performance Butterfly Valve design is available in sizes DN50 to DN1200 as standard and for pressure ratings of PN16 and PN25. Valves can be supplied in higher pressures and larger sizes on request. Each KINGER product is backed up by excellent technical, sales and after sales service.

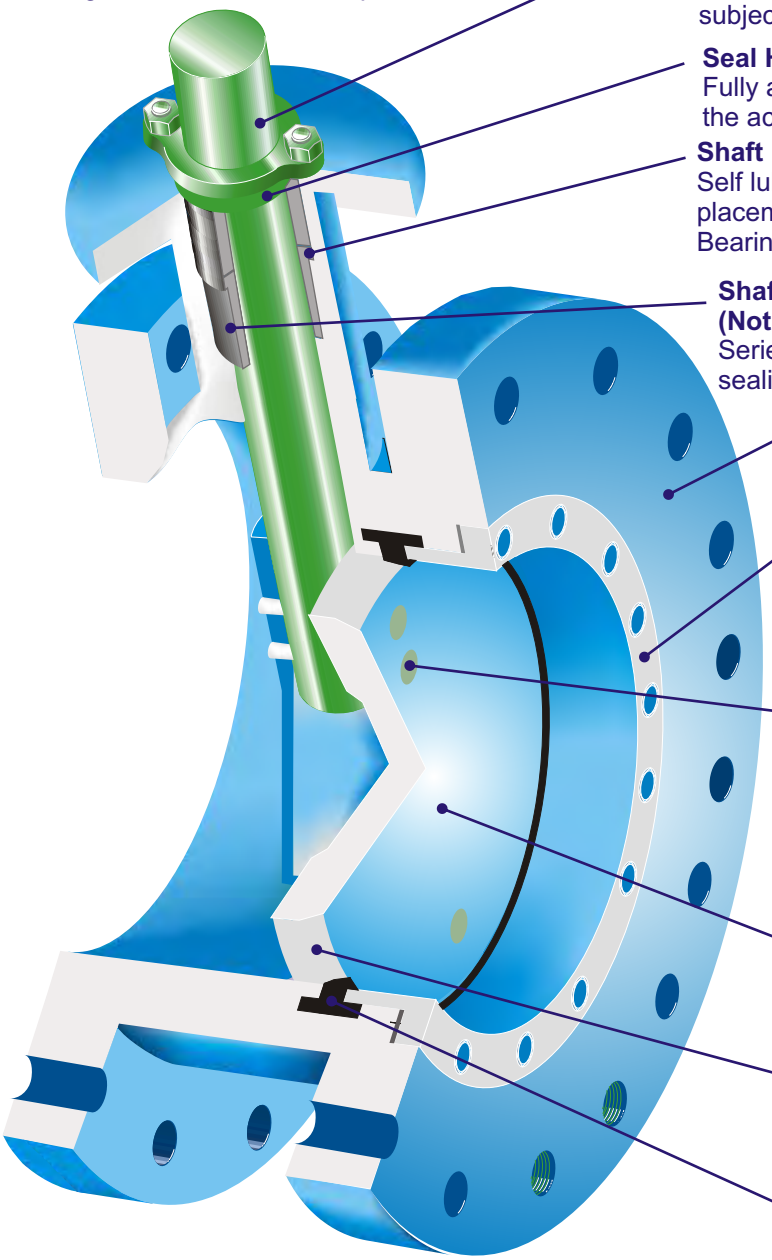
HIGH PERFORMANCE DOUBLE OFFSET BUTTERFLY VALVES

INDEX

MATERIALS OF CONSTRUCTION

KINGER is a range of Double Offset High Performance Butterfly valves designed and developed specifically for the water industry. The heavy duty KINGER product range was developed taking into account the best of double offset butterfly valve technology whilst overcoming the shortcomings inherent in some designs . This results in a product that offers the highest integrity of materials of construction relative to application, provides bi-directional sealing as standard. In addition, the KINGER range is available with either a Seal in Body or Seal in Disc design. Further, 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/or Customer's specification.



Shaft - S/Steel 316
Two Stub Shafts liberally sized to withstand all working conditions that the valve is subjected to.

Seal Housing - Gunmetal BS EN CC491K
Fully adjustable without the need to remove the actuator

Shaft Bearing - Bronze/ Glacier DU (B)
Self lubricating designed to allow valve placement in the horizontal or vertical. Bearing has very low torque requirements

Shaft Seals - EPDM O-Rings (Not Shown)
Series of O-Ring Seals to ensure driptight sealing under all operating conditions.

Body - Epoxy Coated Ductile Iron
High strength, double flanged body design

Seal Retainer - S/Steel 316
Fully adjustable mechanical Seat Retainer can adjust or retain seat in situ 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 - Epoxy Coated Ductile Iron
Latticed design for low headloss characteristics and stability under all flow conditions.

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

Seal - EPDM / S/Steel 316
Options of either Metal to Metal or Soft Seal arrangement to suit all applications. Options in addition, include Seal in Disc or Seal in body design.

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.

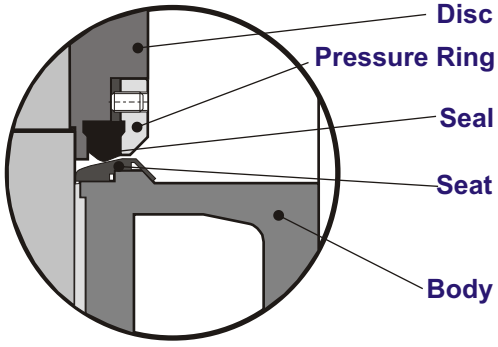
SEAT & SEAL OPTIONS

KINGER High Performance Double Offset Butterfly Valves are designed with a variety of Seating and Sealing options to suit most specifications and application requirements. The valves are manufactured in Ductile with Stainless Steel 316 trim as standard. Options include:

SEAL IN DISC DESIGN

The KINGER Seal in Disc is a Double Offset design to BS 5155 standards where the specially profiled EPDM/Nitrile Seal is keyed and clamped in the disc by an adjustable mechanical Pressure Ring manufactured in stainless steel 316 as standard. The seal seats onto a specially profiled stainless steel 316 **Seat** pressure fitted into the body.

This design is suited for most low to medium pressure potable water applications.

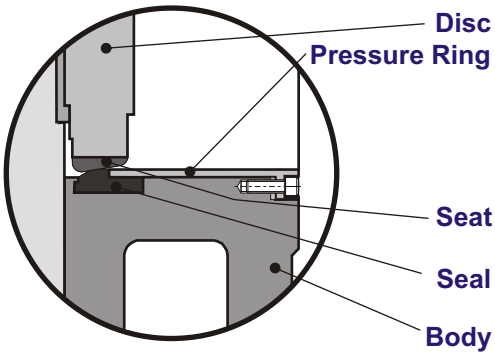


Seal in Disc

SEAL IN BODY DESIGN

The KINGER Seal in Body design is Double Offset design to BS 5155 standards where the profiled EPDM/Nitrile Seal is held in the body by an adjustable mechanical stainless steel 316 Pressure Ring. The Seat is on the disc and is deposit welded stainless steel 316 and specifically machined to reduce opening and closing torque.

This design is preferred by engineers in most potable and raw water applications especially where tubercular growth may be a problem or in high flow applications.

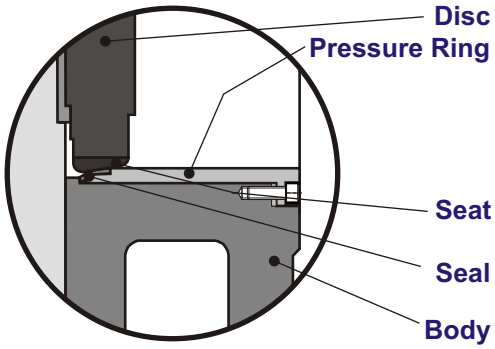


Seal in Body

METAL TO METAL SEAL

KINGER offers a cost effective and reliable Metal to Metal seat arrangement. The Seat in this design is on the Disc in the form of an accurately machined deposit weld Stainless Steel 316 seat. The Seal is a specifically profiled, adjustable Stainless Steel 316 Stainless Seal on the Pressure Ring.

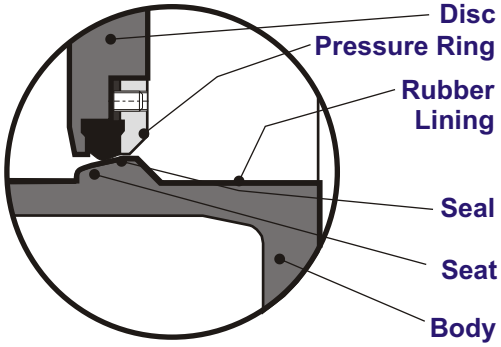
This design is preferred by engineers in most potable and raw water applications especially where tubercular growth may be a problem or in high flow applications.



Metal to Metal

RUBBER LINED BODY AND DISC

KINGER offers a cost effective fully Rubber Lined solution in medium pressure applications where saline or aggressive fluids are being conveyed. The entire valve Body and Disc is rubber lined with special attention paid to the vulcanising process. Any exposed metal parts are supplied in Aluminum Bronze or Duplex.



Rubber Lined

PRINCIPLES OF OPERATION

Many variations of the Disc design have evolved relative to the orientation of the Disc and Shaft in an attempt to improve flow, sealing and/or operating torque. The three most common Disc and Stem orientations utilised in the water industry are:

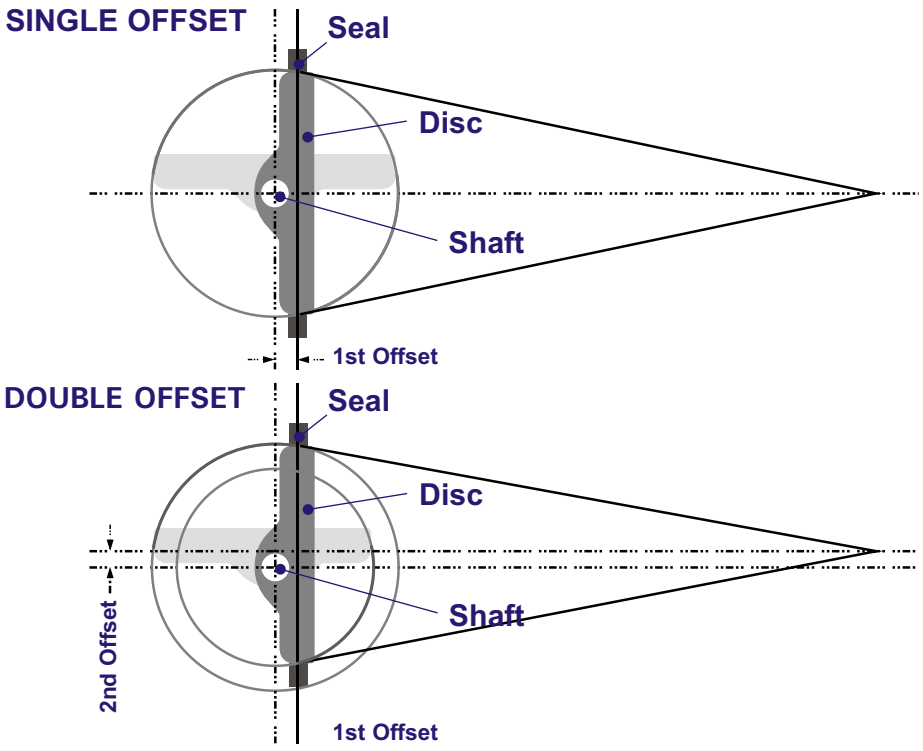
NO OFFSET
The axis of the valve Shaft passes through the centre of the disc and the axis lies in the plane of the seating edge in valves that have no Disc Offset. Low Pressure designs such as water Rubber Lined each have no offsets.

SINGLE OFFSET (SINGLE ECCENTRIC)
The sealing plane of the Disc is Offset from the axis of rotation. This provides an uninterrupted circular sealing surface on the Disc that makes it possible for a circular sealing element to be placed in the valve. It can be easily removed from the valve without disassembly of the Shaft/Disc closure elements. The Seal, in Single Offset designs where the Seal is retained in the Disc, tends to be pinched when the valve is in the open position. This with time can lead to leakage.

DOUBLE OFFSET (DOUBLE ECCENTRIC)
First, the sealing plane of the Disc is Offset from the axis of rotation. This provides an uninterrupted circular sealing surface on the Disc that makes it possible for a circular sealing element to be placed in the valve.

Second, 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. This design eliminates wear points around the Disc at the top and bottom of the Seal. When closing, the Disc cams tightly into its Seat to create a bubble-tight Seal with consistent torque. This Eccentric rotation has a tremendous impact of extending the duration of the valve's leak-free performance.

KINGER is a Double Offset design incorporating the best that Double Offset valve technology has to offer.



WHY KINGER BUTTERFLY VALVES?

Shaft Design
The KINGER design utilises a 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 installations.

Bearings
Sleeve-type Bearings are used in both trunnions of the KINGER valve body. Materials used has special non-metallic backing. This provides electrical insulation between Disc and Shaft to prevent galvanic corrosion. Lower coefficient of friction cuts down operating torque requirements.

Shaft Connections
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.

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.

Sealing/Seating Options
KINGER provides unparalleled sealing and seating options in both Soft Seal and Metal to Metal arrangements to suit most applications. Seating and Sealing arrangements include Seal in Disc, Seal in Body, Metal to Metal and fully Rubber Lined Soft Seating arrangements.

Bi-Directional Sealing
Bi-directional sealing is achieved a standard in all KINGER design configurations.

Double Offset Design
The sealing plane of the Disc is offset from the axis of rotation which in turn is laterally displaced from the true centre of the Disc so that it cams away from the Seal to eliminate jamming or squeezing as the valve is opened and closed.

The KINGER design eliminates wear points around the Disc at the top and bottom of the Seal. When closing, the Disc cams tightly into its Seat to create a bubble-tight seal with consistent torque. This Eccentric rotation of the KINGER design has a tremendous impact of extending the duration of the valve's leak-free performance.

Materials of Construction
KINGER High Performance Butterfly Valves incorporate the highest integrity of materials of construction relative to application. Valves are manufactured in Epoxy Powder Coated Ductile Iron with the valve Shafts and trim in Stainless Steel 316 as standard.

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

HIGH PERFORMANCE DOUBLE OFFSET BUTTERFLY VALVES

GENERAL SPECIFICATIONS

DESIGN TYPE
Double Offset, double flanged, bi-directional High Performance Butterfly Valve

ACCEPTABLE MEDIA
Water and neutral liquids

OPERATING PRESSURE RANGE
PN10, PN16, PN25 & PN40

OPERATING TEMPERATURE RANGE
0° to 70°C

SIZE RANGE
DN100 to DN1600

MATERIALS OF CONSTRUCTION
Refer to Page 1

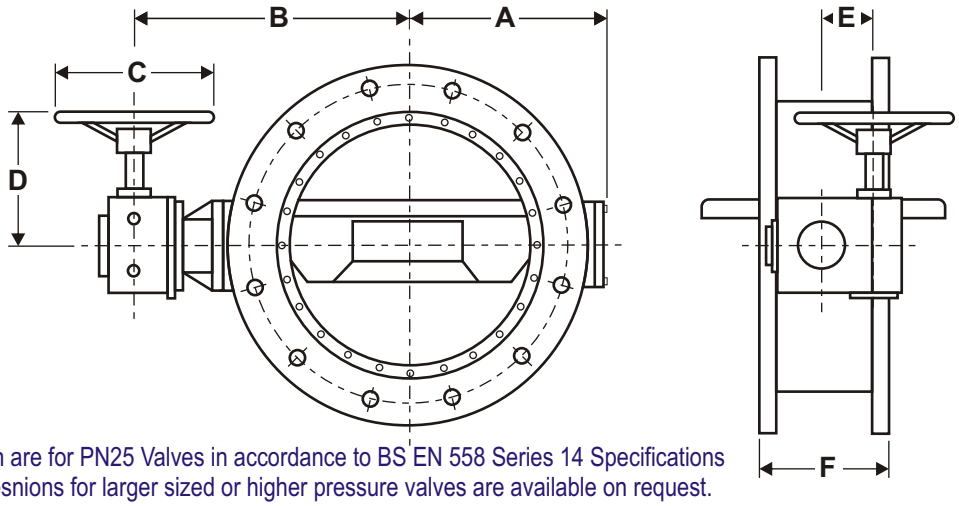
STANDARD FACTORY TESTS
Seat 1.1 x PN Body 1.5 times PN

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

DESIGN AND OPERATING OPTIONS
Electric or hydraulic actuation
Full Rubber Lining of body
Seal in Disc or Seal in Body or Metal to Metal Seat
Alternative materials of construction

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

OVERALL DIMENSIONS



NOTE:
Weight given are for PN25 Valves in accordance to BS EN 558 Series 14 Specifications
Overall dimesnions for larger sized or higher pressure valves are 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

WORM GEAR OPERATORS

GENERAL VALVE DESIGN

KINGER High Performance Double 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 Double Offset disc arrangement combined with a wide choice of seating styles and seating materials and the ability to fully rubber line the valve 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 an the design is such that seat inserts can be replaced on site and the valve can be put back into service immediately.

The KINGER Double 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

PURCHASE SPECIFICATIONS

GENERAL
All valves shall be of the tight-closing, Double 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 High Performance Double Offset design

BODY
All valve bodies shall be double flanged and constructed in Ductile Iron BS EN Gr 500/7 or DIN GGG 40 or 50, coated internally and externally with fusion bonded epoxy powder coating. Flange alignment shall conform to PN10,PN16,PN25 and PN40 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 BS EN Gr 500/7 or DIN GGG 40 or 50, coated internally and externally with fusion bonded epoxy powder coating Disc Sealing edge shall be in Stainless Steel 316 as standard.

SHAFT
Valves shall be of a 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 Shaft shall have at least two Pins to secure it to the Disc. Shaft sealing shall be effected by a series of O-Ring Seals housed in a fully adjustable Seal Housing constructed from Gunmetal in accordance to BS EN CC491K.

SEAT
All seats shall be in the valve body or seating shall be of a Metal to Metal Sealing arrangement - with Metal Sealing constructed in Stainless Steel 316. Seats located on the valve Discs unless for low pressure applications are not acceptable - Metal to Metal & EPDM Rubber.

Seals shall be in EPDM rubber, and shall be field adjustable and replaceable without the use of special tools or factory personnel. Valves shall be installed with full Seal adjustment downstream.

BEARINGS
All Shaft bearings shall be of the self-lubricating, corrosion-resistant, sleeve type. Bearings shall be designed for horizontal and/or vertical Shaft loading.

COATINGS AND LININGS
The valve Body and Disc shall be Fusion Bonded Epoxy Coated to a minimum thickness of 250 microns.

The flow path and Disc of valves for saline applications shall be fully Rubber Lined. Exposed metal parts shall be in Duplex or Aluminum Bronze.

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.

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

Seat in Body	**SB**
Seat in Disc	**SD**
Metal to Metal Seat	**MM**
Fully Rubber Lined Flow Path and Disc	**RL**

OPERATOR
Worm Gear Gearbox

OPERATOR OPTIONS

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

TRIPLE OFFSET BUTTERFLY VALVES

Kinger

TRIPLE OFFSET BUTTERFLY VALVE

KINGER TRIPLE OFFSET BUTTERFLY VALVES

KINGER is a range Triple Offset Butterfly valves designed and developed specifically for heavy duty application where a reliable Metal to Metal seat is required.

The heavy duty KINGER product range was developed taking into account the best that Triple Offset Butterfly Valve technology has to offer. This results in a product that provides bi-directional 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.

KINGER offers the highest integrity of materials of construction relative to application. Each valve is supplied in Cast Steel, fusion bonded epoxy powder coated as standard with stainless steel 316 trim. Products in addition, can be supplied in a variety of exotic materials to suit most applications.

The KINGER Triple Offset High Performance Butterfly Valve design is available in sizes DN50 to DN1600 as standard and for pressure ratings of PN16 and PN25, PN40 and PN64. Valves can be supplied in higher pressures and larger sizes on request. Each KINGER product is backed up by excellent technical, sales and after sales service.

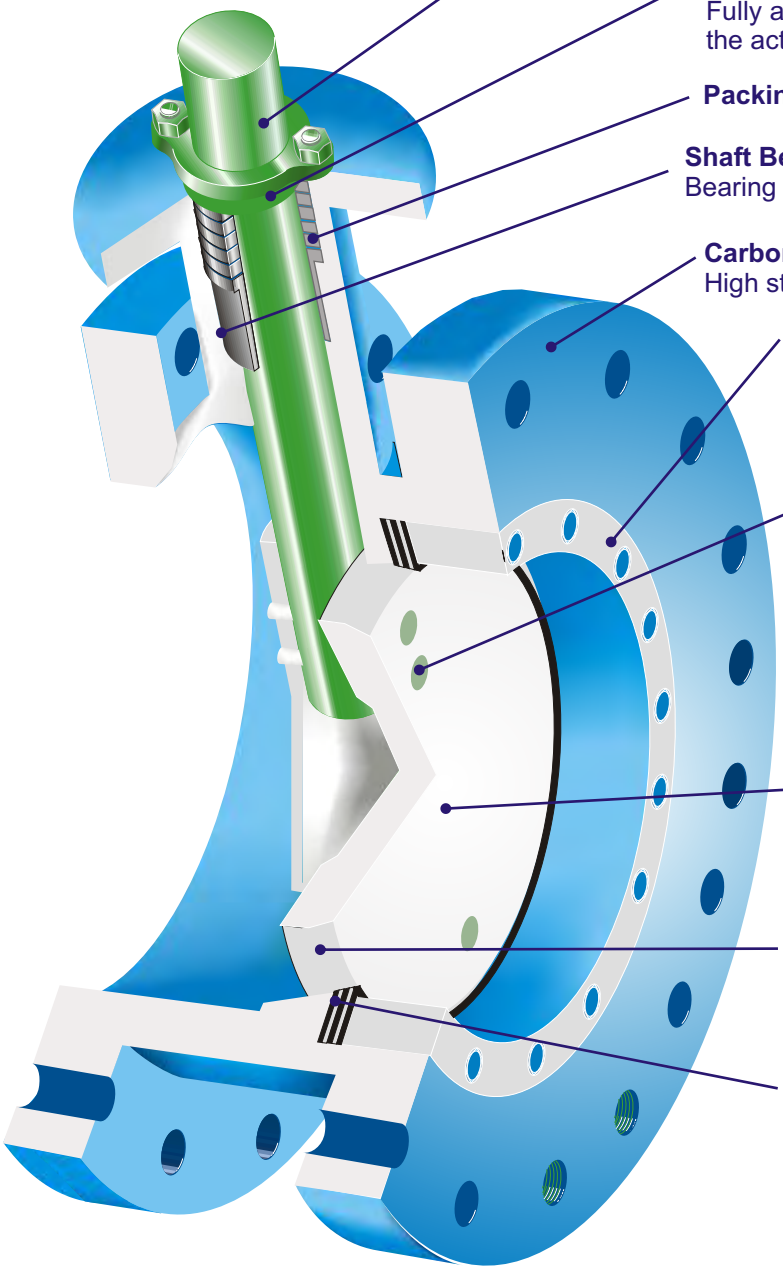
TRIPLE OFFSET BUTTERFLY VALVES

INDEX

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.

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.

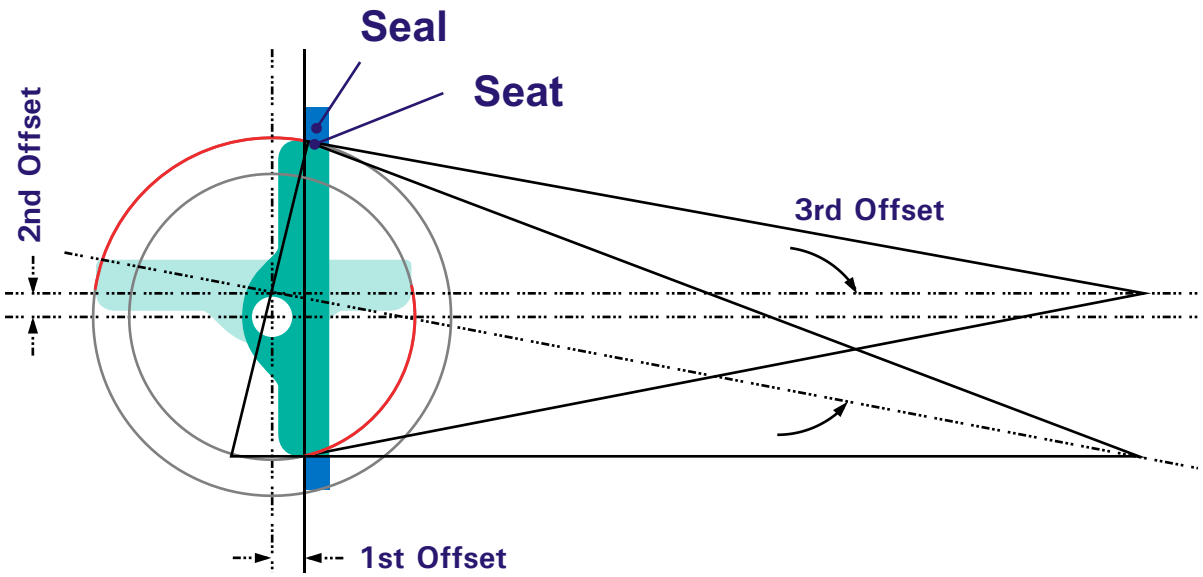
First Offset
The Sealing plane of the Disc is offset from the axis of rotation. This provides an uninterrupted circular sealing surface on the Disc.

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



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

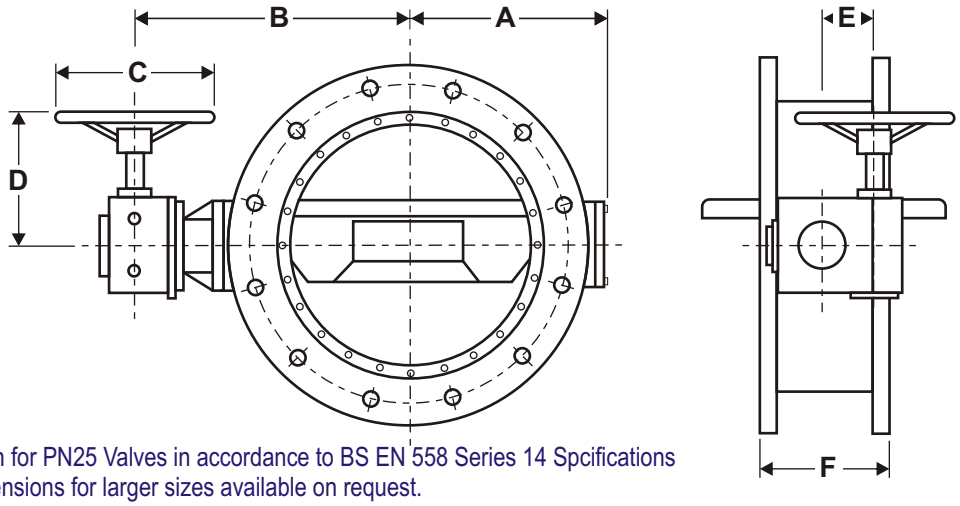
STANDARD FACTORY TESTS
Seat 1.1 x PN Body 1.5 times PN

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

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

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 KINGER 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.

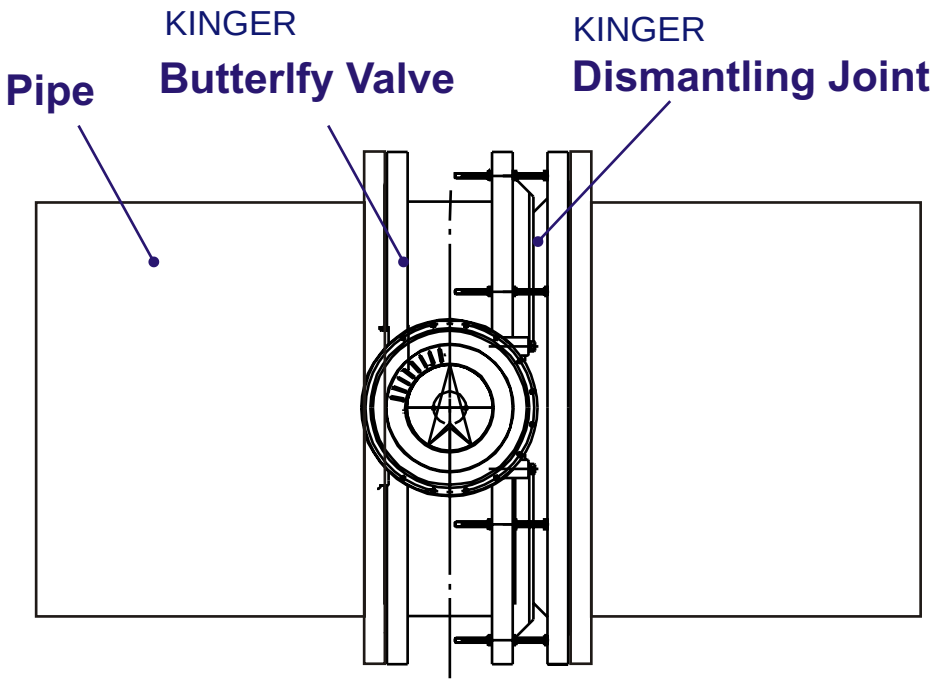
Operation

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 MaxiPro 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.

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, bidirectional 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.

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**