

BUTTERFLY VALVES

LOWER TORQUE CONCENTRIC



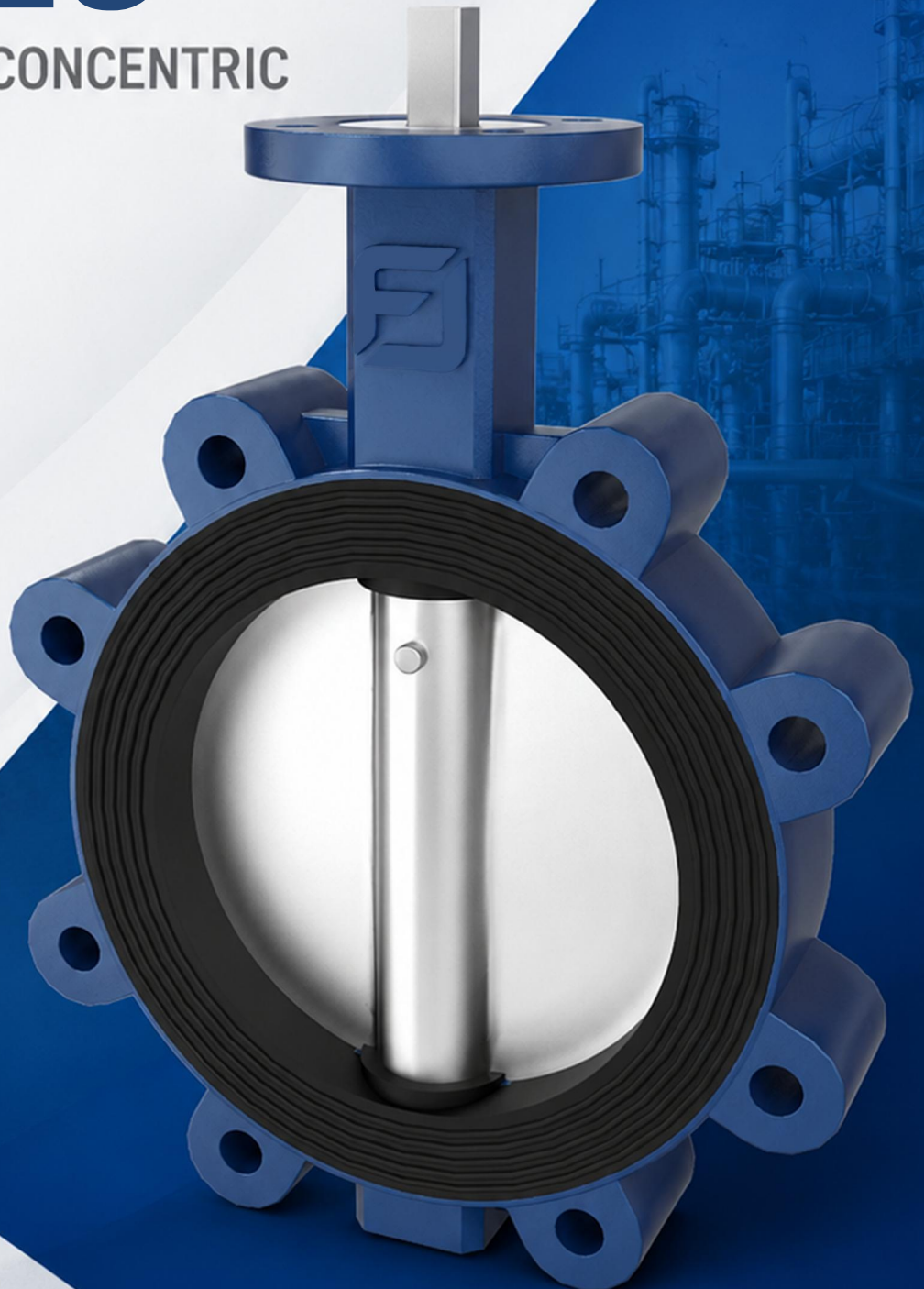
LOWER
TORQUE



CONCENTRIC
DESIGN



RELIABLE
SEALING



Why choose Floeriner?

Floeriner is a global valve manufacturer with innovative design and advanced technology for the marine, offshore, industrial, and petrochemical markets. This in turn improves plant safety, increases the mechanical integrity of equipment, and empowers customers to gain a competitive advantage in the marketplace.



Low Torque

The special design of the internal structure and shaft greatly reduces valve torque. Lower torque not only means easier operation, but also leads to a more compact connection with electric, hydraulic, and pneumatic actuators. Lower torque will save money and energy.



Widen flanging rubber liner

Widened design for flanging rubber liner, ensures sufficient contact with the flange sealing surface, without need of any gaskets to achieve zero leakage.



Fire safe design

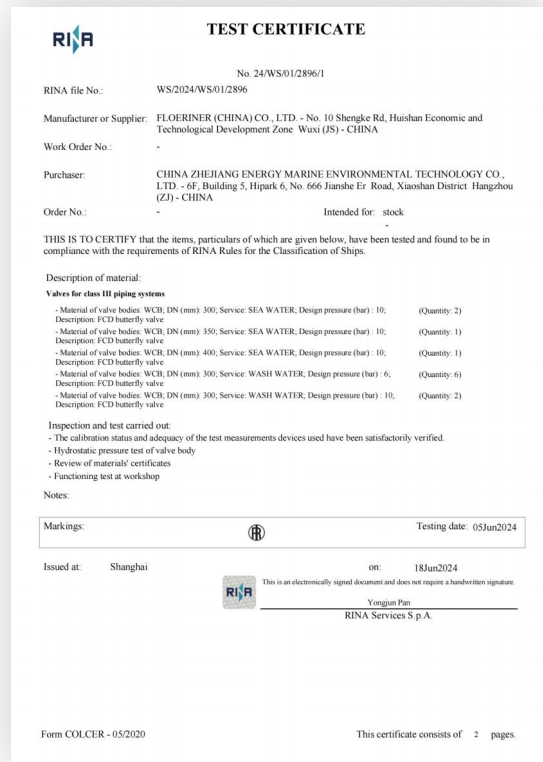
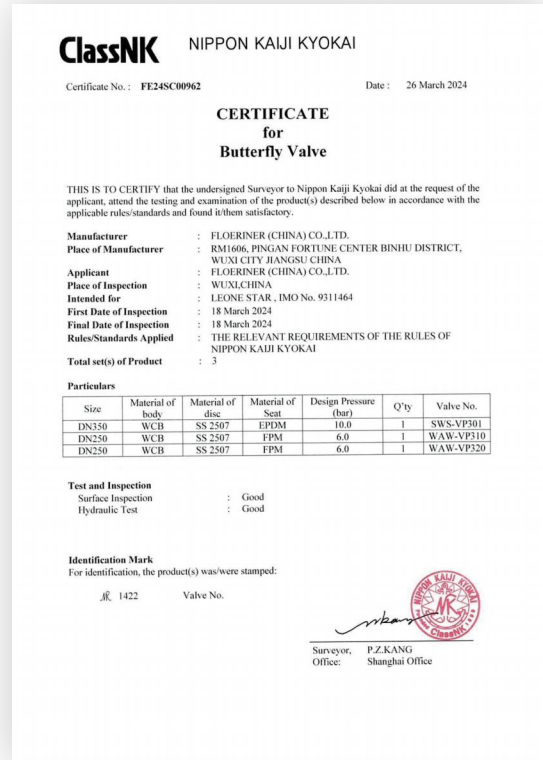
The valve is specially designed for sealing capabilities and has passed the fire test according to ISO 19921-2005 and GB/T 22218-2008. LR fire safety certificate to be supplied if needed.

The fire safe feature of butterfly valves is an important factor in ensuring safety and security in facilities.

When butterfly valves without fire-safe sealing fail during a fire, they may cause further damage to the pipework or the entire flow system, endangering not only the environment but also people's lives.

This is why fire-safe butterfly valves are highly suitable for handling firefighting, hazardous, and flammable fluids.

Flöriner
APPENDICES



Qualification



CERTIFICATE NUMBER 24-2499272-PDA
EFFECTIVE DATE 16-Jul-2024
EXPIRATION DATE 15-Jul-2029
ABS TECHNICAL OFFICE CN Shanghai ESD

CERTIFICATE OF Product Design Assessment

This is to certify that a representative of this Bureau did, at the request of
FLOERINER (CHINA) CO., LTD. (457531)
located at
NO.10 SHENGKE ROAD, HUIZHAN ECONOMIC AND
TECHNOLOGICAL DEVELOPMENT ZONE, , WUXI, China

assess design plans and data for the below listed product. This assessment is a representation by the Bureau as to the degree of compliance the design exhibits with applicable sections of the Rules. This assessment does not waive unit certification or classification procedures required by ABS Rules for products to be installed in ABS classed vessels or facilities. This certificate, by itself, does not reflect that the product is Type Approved. The scope and limitations of this assessment are detailed on the pages attached to this certificate.

Product Valve, Composite Butterfly Valve
Model Butterfly valve: FCW, FCD, FCL, FCU, FDW, FDL, Butterfly Damper: SD-Series
Endorsement:

Tier: 3 - Type Approved, unit certification not required
This Product Design Assessment (PDA) Certificate remains valid until 15/Jul/2029 or until the Rules and/or Standards used in the assessment are revised or until there is a design modification warranting design reassessment (whichever occurs first).

Acceptance of product is limited to the "Intended Service" details prescribed in the certificate and as per applicable Rules and Standards.

This Certificate is valid for installation of the listed product on ABS units which exist or are under contract for construction on or previous to the effective date of the ABS Rules and standards applied at the time of PDA issuance. Use of the Product for non-ABS units is subject to agreement between the manufacturer and intended client.

American Bureau of Shipping

Xiao-Wei Xu, Manager

Review 1

Certificate No.: SHIEM-0176-22



Certificate for Valve [Butterfly Valve]

General Information

Date of Issue	29 September 2022	Date of Commencement	29 September 2022
Work's Order No.	-	Purchase Order No.	-
Place of Inspection	Wuxi, CHINA	Office	Shanghai Office
Job ID	0000036	Quantity/Weight	3 Set(s)
Manufacturer	Floeriner(China) Co., Ltd.		
Purchaser	-		
Intended for	INHERIT, IMO No.: 9181649		
Approval Status	-		

Particulars

Type	Nominal Bore (mm)	Nominal Press (bar)	Design Temp. (°C)	Material /Standard	Test Press (bar)	Quantity
SMS-VP301	DN350	10	130	ZG230-450	15	1
WAB-VP310	DN300	6	200	ZG230-450	9	1
WAB-VP220	DN300	6	200	ZG230-450	9	1
Total						3

Testing and Inspection

Hydraulic Test
Finished Condition Inspection

Marking, Serial No. and Remarks

SHIEM-0176-(1-3)
29-09-22
Serial No. FXE220925001, FXE220925002, FXE220925003



This certificate is signed electronically in accordance with IMO FAL, SICirc 26/Rev 2. Validation and authentication of the certificate can be confirmed from "http://e-cert.krs.co.kr" by using the tracking No(ME22028633435) and certificate No (SHIEM-0176-22).



KOREAN REGISTER

0706 QIAN Chengxu

This Certificate is issued to the above client to certify that the undersigned Surveyor did at their request attend the above place for the purpose of examining and testing the item of material, equipment or any other item covered by this certificate in accordance with the relevant Rules for the Classification of the Class and Bureau's satisfactory. This Certificate is a representation only that the item of material, equipment or any other item covered by this Certificate has been examined for compliance with the Rules Requirement and the Surveyor, finding contained in this Certificate or in any Report issued in contemplation of this Certificate shall be deemed to release any customer of this Surveyor or other entity of any warranty expressed or implied.

EM18 (2021.01)

1/1
KOREAN REGISTER



RECOGNITION FOR BV MODE II SCHEME

Floeriner (China) Co., Ltd
Wuxi - CHINA

Summary of the range of the recognition which is detailed in the subsequent page(s):

Marine valves- G0802;
Flexible hose unit- G0236;
Rubber expansion joints - G0196;
Air dryer- G1036;
Drip sampler- G0802;
Remote Control Unit- G0563
Alarm and monitoring systems- G0723
Shredder and compactor unit- G1245

This certificate is issued to attest that Bureau Veritas Marine & Offshore has performed, at the above company's request and in compliance with the requirements of ISO 9001, a satisfactory assessment of the manufacturing facilities and associated quality procedures related to the range of the recognition.

This certificate will expire on: 08 May 2027

For BUREAU VERITAS,
At BV SHANGHAI, on 04 Jun 2023,
Jennifer Zhang

This certificate was created electronically and is valid without signature



This certificate remains valid until the date stated above, unless cancelled or revoked, provided the conditions indicated in the subsequent page(s) are complied with. This certificate is issued under the scope of the General Conditions of Bureau Veritas Marine & Offshore available on the internet site www.veristar.com. Any Person not a party to the contract pursuant to which this document is delivered may not assert a claim against Bureau Veritas Marine & Offshore for any liability arising out of errors or omissions which may be contained in said document, or for errors of judgment, fault or negligence committed by personnel of the Society or of its Agents in establishment or issuance of this document, and in connection with any activities for which it may provide.

The electronic version is available at: <http://www.veristar.com/veristar/bv/viewPublicPdfRecognition.jsp?Id=6094944>
BV Mod. Ad.E 697 June 2017

This certificate consists of 2 page(s).

FC Series

Floeriner Concentric butterfly valves (FC series) are suitable for mounting between flanges according to DIN, EN, ISO PN6 to PN25, ASME 150# to 300#, and JIS 5K to 16K. Face-to-face dimensions are according to EN558 basic series 20 and 13, API609, DIN 3032 K1 and F16, BS 5155, and JIS series 46 and 42. Size ranges are DN40 to DN1200 (48"), widely used in shipbuilding, offshore, industrial, and petrochemical applications.

We manufacture multiple versions with required materials and working pressures ranging from 6 to 25 bar.

We can offer manual, hydraulic, electric, and pneumatic operation, as well as other types such as electro-hydraulic operation according to customer requirements.



FCW

Concentric butterfly valve, VULCANISED LINER, WAFER TYPE

Nominal size: DN40 to DN1200 (48")

Face to face: DIN 3202, EN558, ISO 5752, BS 2080, JIS 2002, API609, etc.

Connection: EN1092, ASME B16.5, JIS B2239&2220, GB/T 9119, etc.

Temperature range: -35°C to 200°C

Top flange acc.: ISO 5211

Also applicable to vacuum environment.



FCD

Concentric butterfly valve, VULCANISED LINER, DOUBLE FLANGE TYPE

Nominal size: DN50 to DN1200 (48")

Face to face: DIN 3202, EN558, ISO 5752, BS 2080, JIS 2002, API609, etc.

Connection: EN1092, ASME B16.5, JIS B2239&2220, GB/T 9119, etc.

Temperature range: -35°C to 200°C

Top flange acc.: ISO 5211

Also applicable to vacuum environment.



FCL

Concentric butterfly valve, VULCANISED LINER, LUG TYPE

Nominal size: DN40 to DN1200 (48")

Face to face: DIN 3202, EN558, ISO 5752, BS 2080, JIS 2002, API609, etc.

Connection: EN1092, ASME B16.5, JIS B2239&2220, GB/T 9119, etc.

Temperature range: -35°C to 200°C

Top flange acc.: ISO 5211

Also applicable to vacuum environment.



FCU

Concentric butterfly valve, VULCANISED LINER, U-FLANGE TYPE

Nominal size: DN50 to DN1200 (48")

Face to face: DIN 3202, EN558, ISO 5752, BS 2080, JIS 2002, API609, etc.

Connection: EN1092, ASME B16.5, JIS B2239&2220, GB/T 9119, etc.

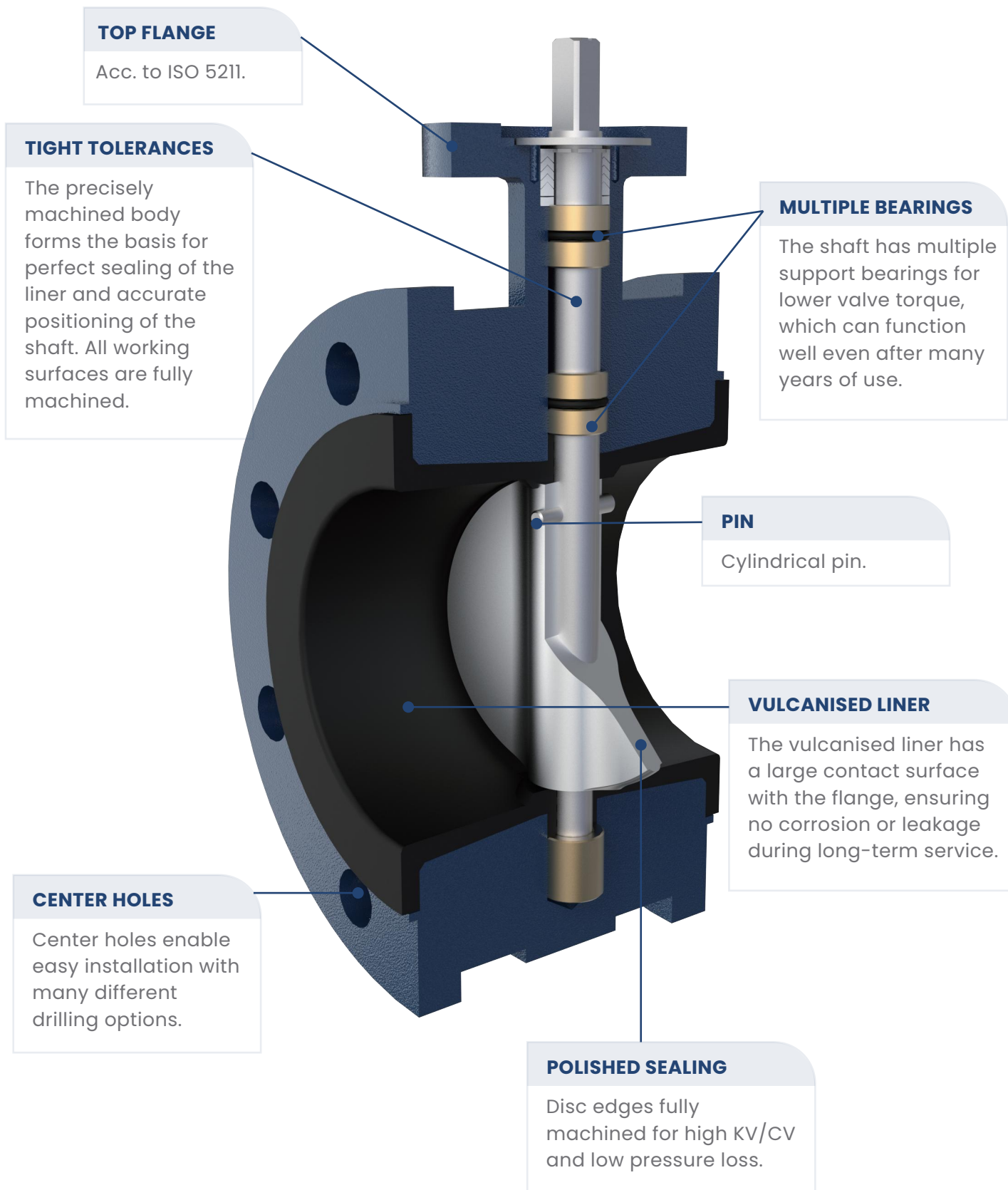
Temperature range: -35°C to 200°C

Top flange acc.: ISO 5211

Also applicable to vacuum environment.

FCW Series

Product Advantages at a Glance



FC Series product introduction

The FC Series is a concentric wafer-type butterfly valve. The rubber liner is vulcanized integrally onto the valve body and extends along the valve faces, eliminating the need for gaskets.

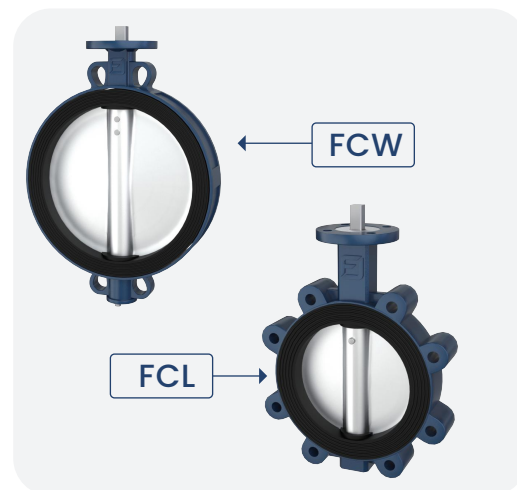
Design:	Face to face:
EN 593, EN 736, EN 12516, ISO5211, DIN 3337, API 609.	DIN 3202, EN558, ISO 5752, BS 2080, JIS 2002, API609, etc.
Testing:	Paint:
EN 12266-1 Rate A (supersedes DIN 3230), ISO 5208 Rate A, API 598.	Akzo Nobel, Epoxy coated, RAL5011, 150µm.

Operation

Type	Material	DN
Bare shaft		DN40 (1.5") to DN1200 (48")
Lever	Aluminum alloy	DN40 (1.5") to DN150 (5")
Worm gearbox	Aluminum alloy Ductile iron	DN40 (1.5") to DN450 (18") DN500 (20") to DN1200 (48")

Pressure and temperature range

PN	DN	Temp.
☐ 6	☐ DN40 (1.5") to DN1200 (48")	☐ NBR: -25°C to 100°C
☐ 10	☐ DN40(1.5") to DN1200(48")	☐ EPDM: -35°C to 130°C
☐ 16	☐ DN40(1.5") to DN1200(48")	☐ FPM/FKM (Viton): -20°C to 200°C
☐ 25	☐ DN40(1.5") to DN600(24")	☐ PTFE: -55°C to 190°C (body has special structure)

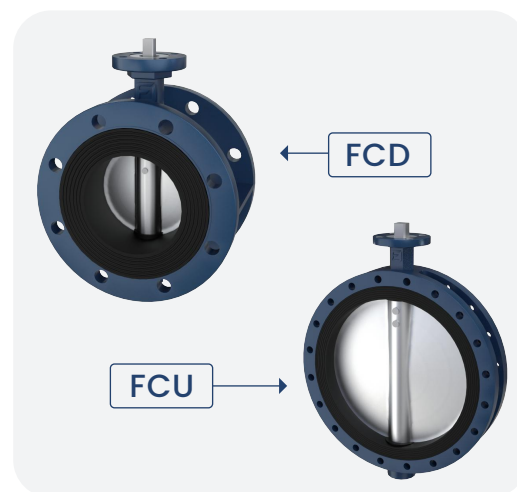


Operation

Type	Material	DN
Bare shaft		DN50(2") to DN1200(48")
Lever	Aluminum alloy	DN50(2") to DN150(5")
Worm gearbox	Aluminum alloy Ductile iron	DN50(2") to DN450(18") DN500(20") to DN1200(48")

Pressure and temperature range

PN	DN	Temp.
☐ 6	☐ DN50(2") to DN1200(48")	☐ NBR: -25°C to 100°C
☐ 10	☐ DN50(2") to DN1200(48")	☐ EPDM: -35°C to 130°C
☐ 16	☐ DN50(2") to DN1200(48")	☐ FPM/FKM (Viton): -20°C to 200°C
☐ 25	☐ DN50(2") to DN600(24")	☐ PTFE: -55°C to 190°C (Body is special structure)



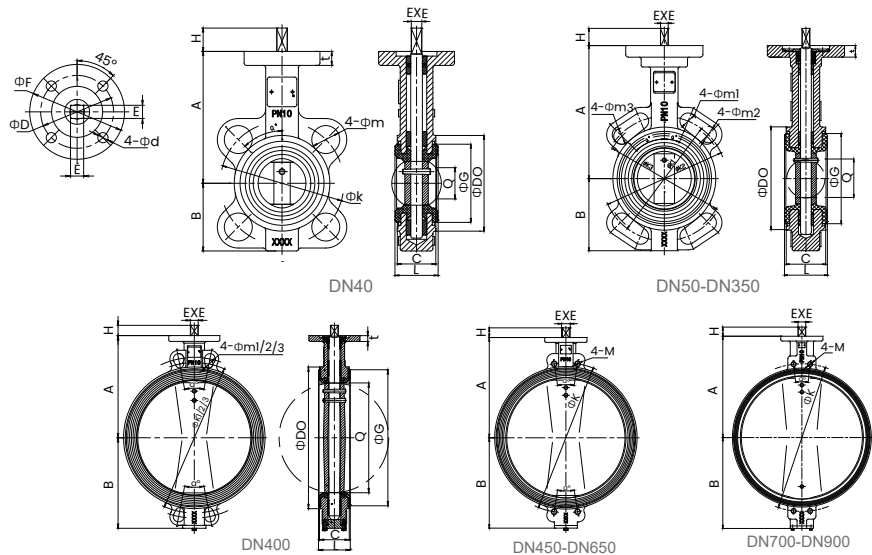
Material specification

Body	Disc	Shaft	Liner
☐ Ductile iron	☐ Cast steel + PFA	☐ Al-bronze	☐ NBR
☐ Cast steel	☐ Stainless steel	☐ Stainless steel	☐ EPDM
☐ Stainless steel	☐ Al-bronze	☐ Duplex steel	☐ FPM
☐ Bronze	☐ Monel alloy	☐ Hastelloy alloy	☐ PTFE (Body is special structure)
☐ Duplex SS	☐ Duplex SS	☐ Monel alloy	☐ PTFE

FCW Series

The FCW series can be widely used in general industrial and maritime piping systems for media such as seawater, water, gases, oil, and corrosive media.

The pin-type butterfly valve features a simple structure and offers significantly better stability than the pinless type.



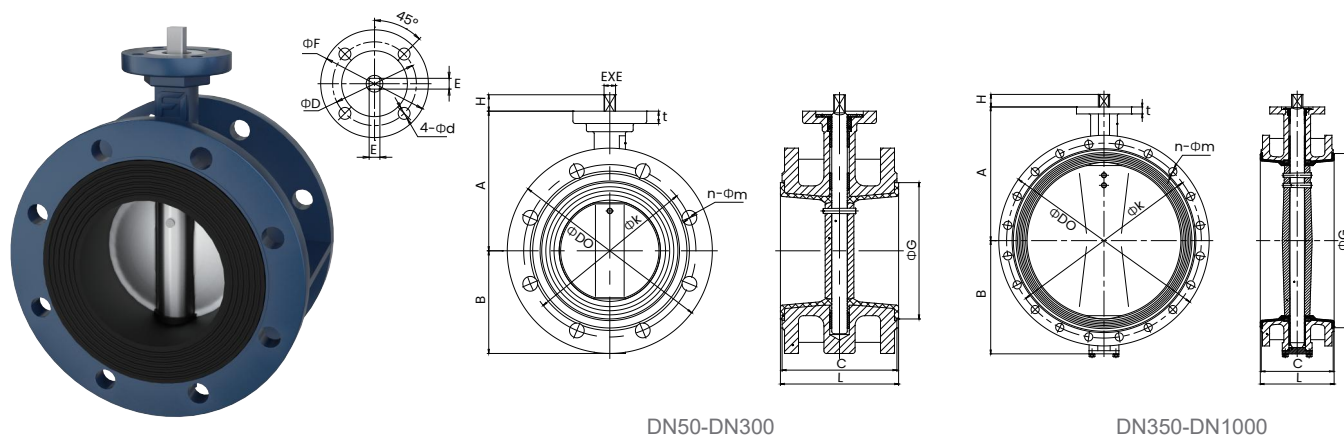
Dimension

SIZE \ DIM	DIM									TOP FLANGE DIMENSIONS					END CONNECTION			
	A	B	C	L	DO	G	Q	H	E	ISO5211	F	D	d	t	K-m-a°	K1-m1-a°	K2-m2-a°	K3-m3-a°
DN40(1.5")	113	58	33	37	82	67	27	20	9X9	F05	65	50	7	12	125-19-45°	--	--	--
DN50(2")	118	65	43	47	101	86	31	20	9X9	F07	90	70	10	13.5	--	125-19-45°	120-19-45°	--
DN65(2.5")	155	84	46	50	120	105	45	20	9X9	F07	90	70	10	13.5	--	145-19-22.5°	145-19-45°	140-19-45°
DN80(3")	162	90	46	50	133	118	64	20	9X9	F07	90	70	10	13.5	--	160-19-22.5°	152-19-45°	--
DN100(4")	177	106	52	56	161	145	91	20	11X11	F07	90	70	10	15	--	190-23-22.5°	180-19-22.5°	--
DN125(5")	190	127	56	60	191	175	110	20	14X14	F07	90	70	10	15	--	220-28-22.5°	210-19-22.5°	--
DN150(6")	208	139	56	60	217	201	146	20	14X14	F07	90	70	10	15	--	250-28-22.5°	240-23-22.5°	--
DN200(8")	240	175	60	64	270	254	194	22	17X17	F10	125	102	12	16	--	310-28-15°	295-23-15°	297-25-22.5°
DN250(10")	266	203	68	72	325	309	242	25	22X22	F10	125	102	12	16	--	370-31-15°	355-28-15°	--
DN300(12")	308	234	78	82	375	359	292	25	22X22	F12	150	125	14	18	--	430-31-11.25°	432-25.4-15°	407.5-30.5-15°
DN350(14")	345	270	78	82	435	418	325	25	27X27	F12	150	125	14	18	--	490-34-11.25°	467.5-30.5-11.25°	476-28.4-15°
DN400(16")	350	310	102	109	485	466	466	377	27X27	F14	175	140	18	20	--	490-34-22.5°	490-34-22.5°	--
DN450(18")	375	338	114	121	535	516	426	35	27X27	F14	175	140	18	20	565-M24-18°	--	--	--
DN500(20")	415	374	127	134	590	571	476	40	36X36	F14	175	140	18	20	620-M24-18°	--	--	--
DN550(22")	466	397	154	161	632	612	522	40	36X36	F16	210	165	23	23	680-M30-18°	--	--	--
DN600(24")	465	439	154	161	691	672	573	40	36X36	F16	210	165	23	23	725-M27-18°	--	--	--
DN650(26")	530	466	165	172	730	706	603	40	36X36	F16	210	165	23	23	780-M30-15°	--	--	--
DN700(28")	600	510	165	172	786	760	667	45	46X46	F25	300	254	18	34	840-M27-15°	--	--	--
DN800(32")	635	570	190	197	887	861	773	65	46X46	F25	300	254	18	34	950-M30-15°	--	--	--
DN900(36")	720	646	203	210	962	962	841	65	55X55	F25	300	254	18	34	1050-M30-12.86°	--	--	--
DN1000(40")	820	705	--	251	1110	961	940	115	75X75	F25	300	254	18	--	--	--	--	--
DN1200(48")	942	846	--	276	1320	1181	1132	115	75X75	F25	350	298	22	--	--	--	--	--

FCD Series

FCD series can be widely used in general industrial and maritime piping systems for media such as seawater, water, gases, oil and corrosive media.

The stability of pin butterfly valve is with simple structure and definitely better than the pinless type.



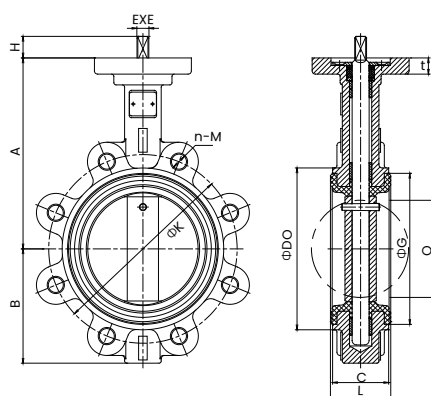
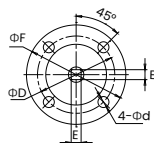
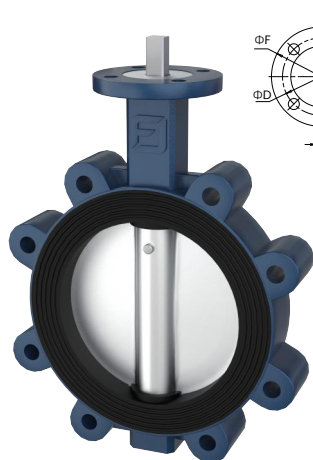
Dimension

DIM SIZE	A	B	C	L	G	H	E	TOP FLANGE DIMENSIONS				
								ISO5211	F	D	d	t
DN50(2")	126	82	108	112	85	20	9X9	F07	90	70	10	13.5
DN65(2.5")	136	92	112	116	102	20	9X9	F07	90	70	10	13.5
DN80(3")	145	100	114	118	116	20	9X9	F07	90	70	10	13.5
DN100(4")	155	114	127	131	140	20	11X11	F07	90	70	10	15
DN125(5")	170	125	140	144	166	20	14X14	F07	90	70	10	15
DN150(6")	191	142	140	144	193	20	14X14	F07	90	70	10	15
DN200(8")	225	175	152	156	248	22	17X17	F10	125	102	12	16
DN250(10")	261	203	165	169	301	25	22X22	F10	125	102	12	16
DN300(12")	296	242	178	182	346	25	22X22	F12	150	125	14	18
DN350(14")	325	275	190	194	412	25	27X27	F12	150	125	14	18
DN400(16")	365	300	216	222	456	35	27X27	F14	175	140	18	20
DN450(18")	390	330	222	228	504	35	27X27	F14	175	140	18	20
DN500(20")	425	360	229	235	554	40	36X36	F14	175	140	18	20
DN550(22")	500	420	267	273	614	40	36X36	F16	210	165	23	22
DN600(24")	505	420	267	273	655	40	36X36	F16	210	165	23	22
DN650(26")	560	455	292	299	706	40	36X36	F16	210	165	23	22
DN700(28")	560	490	292	299	770	45	46X46	F25	300	254	18	30
DN800(32")	620	560	318	325	876	65	46X46	F25	300	254	18	30
DN900(36")	686	622	330	337	973	65	55X55	F25	300	254	18	30
DN1000(40")	780	695	410	417	1083	90	65X65	F30	300	298	22	32
DN1200(48")	917	780	--	420	1328	115	75X75	F30	350	298	22	--

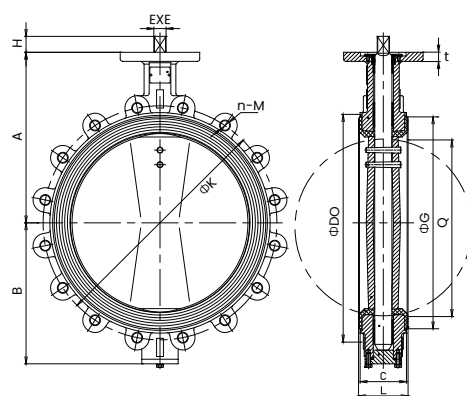
FCL Series

The FCL series can be widely used in general industrial and maritime piping systems for media such as seawater, water, gases, oil, and corrosive media.

The pin-type butterfly valve features a simple structure and offers significantly better stability than the pinless type.



DN50-350



DN400-600

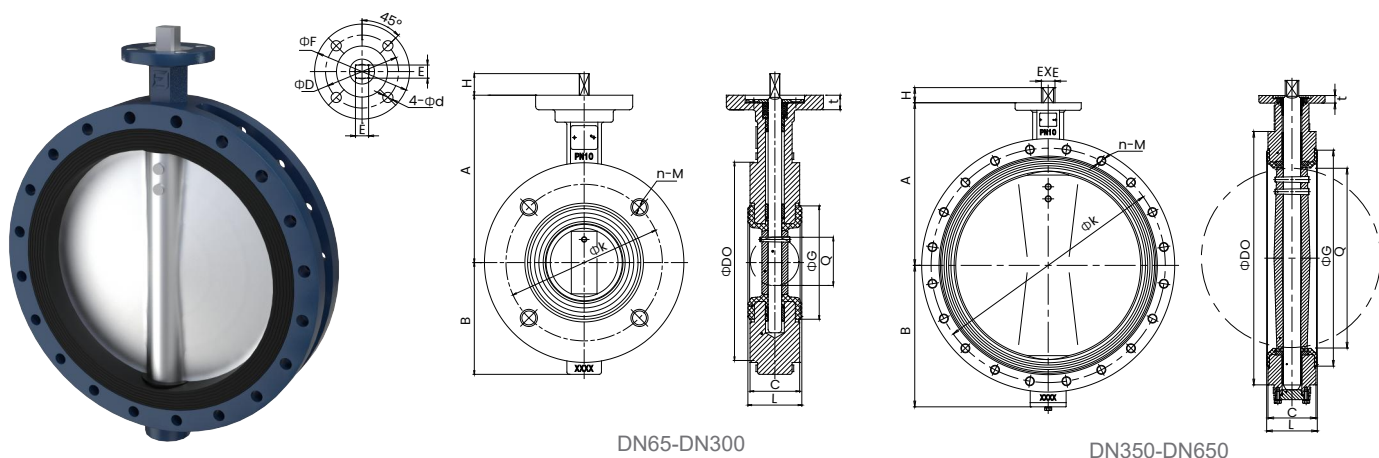
Dimension

SIZE	DIM									TOP FLANGE DIMENSIONS				
	A	B	C	L	DO	G	Q	H	E	ISO5211	F	D	d	t
DN50(2")	118	65	43	47	101	86	31	20	9X9	F07	90	70	10	13.5
DN65(2.5")	155	84	46	50	120	105	45	20	9X9	F07	90	70	10	13.5
DN80(3")	162	90	46	50	133	118	64	20	9X9	F07	90	70	10	13.5
DN100(4")	177	106	52	56	161	145	91	20	11X11	F07	90	70	10	15
DN125(5")	190	127	56	60	191	175	110	20	14X14	F07	90	70	10	15
DN150(6")	208	139	56	60	217	201	146	20	14X14	F07	90	70	10	15
DN200(8")	240	175	60	64	270	254	194	22	17X17	F10	125	102	12	16
DN250(10")	266	203	68	72	325	309	242	25	22X22	F10	125	102	12	16
DN300(12")	308	234	78	82	375	359	292	25	22X22	F12	150	125	14	18
DN350(14")	345	270	78	194	435	418	325	25	27X27	F12	150	125	14	18
DN400(16")	375	320	102	109	--	466	377	35	27X27	F14	175	140	18	20
DN450(18")	400	345	114	121	--	516	426	35	27X27	F14	175	140	18	20
DN500(20")	430	374	127	134	--	571	476	40	36X36	F14	175	140	18	20
DN600(24")	490	439	154	161	--	672	573	40	36X36	F16	210	165	23	23
DN700(28")	600	510	165	172	786	760	667	45	46X46	F25	300	254	18	34
DN800(32")	635	570	190	197	887	861	773	65	46X46	F25	300	254	18	34
DN900(36")	720	646	203	210	988	962	841	65	55X55	F25	300	254	18	34
DN1000(40")	820	705	--	251	--	1110	961	115	75X75	F25	300	254	18	--
DN1200(48")	924	810	--	276	--	1320	1181	115	75X75	F25	350	298	22	--

FCU Series

The FCU series can be widely used in general industrial and maritime piping systems for media such as seawater, water, gases, oil, and corrosive media.

The pin-type butterfly valve features a simple structure and offers significantly better stability than the pinless type.



Dimension

DIM SIZE	A	B	C	L	G	Q	H	E	TOP FLANGE DIMENSIONS				
									ISO5211	F	D	d	t
DN50(2")	118	65	43	47	86	31	20	9X9	F07	90	70	10	13.5
DN65(2.5")	155	104	46	50	105	45	20	9X9	F07	90	70	10	13.5
DN80(3")	162	111	46	50	118	64	20	9X9	F07	90	70	10	13.5
DN100(4")	177	123	52	56	145	91	20	11X11	F07	90	70	10	15
DN120(5")	190	138	56	60	175	110	20	14X14	F07	90	70	10	15
DN150(6")	208	156	56	60	201	146	20	14X14	F07	90	70	10	15
DN200(8")	240	185	60	64	254	194	22	17X17	F10	125	70	12	16
DN250(10")	280	213	68	72	309	242	25	22X22	F10	125	102	12	16
DN300(12")	308	238	78	82	359	292	25	22X22	F12	150	102	14	18
DN350(14")	345	270	78	82	418	325	25	27X27	F12	150	125	14	18
DN400(16")	375	320	102	109	466	377	35	27X27	F14	175	140	18	20
DN450(18")	400	345	114	121	516	426	35	27X27	F14	175	140	18	20
DN500(20")	430	374	127	134	571	476	40	36X36	F14	175	140	18	20
DN550(22")	475	416	154	161	612	522	40	36X36	F14	210	165	23	23
DN600(24")	490	439	154	161	672	573	40	36X36	F16	210	165	23	23
DN650(26")	530	466	165	172	706	603	40	36X36	F25	210	165	23	23
DN700(28")	600	510	165	172	760	667	45	46X46	F25	300	254	18	34
DN800(32")	635	570	190	197	861	773	65	46X46	F25	300	254	18	34
DN900(36")	720	646	203	210	962	841	65	55X55	F25	300	254	18	34
DN1000(40")	820	705	--	251	1110	961	115	75X75	F25	300	254	18	--
DN1200(48")	924	810	--	276	1320	1181	115	75X75	F25	350	298	22	--

FCV Series—Fire safe type

Floeriner Concentric butterfly valves (FCV series) are designed according to DIN, EN, ASME, ISO, and JIS standards. Size ranges are DN40 to DN1200 (48"), and they are widely used in fire protection piping for shipbuilding, offshore, industrial, and petrochemical applications.

FCV series (fire-safe type) valves with NBR, EPDM, and FPM seats have passed the fire test in compliance with ISO 19921-2005 and GB/T 22218-2008.

We manufacture multiple versions with required materials and working pressures ranging from 6 to 25 bar.

We can offer manual, hydraulic, electric, and pneumatic operation, as well as electro-hydraulic operation according to customer requirements.



FCVW

Concentric butterfly valve, vulcanized liner, wafer type

Nominal size: DN40 to DN1200 (48")

Face to face: DIN 3202, EN558, ISO 5752, BS 2080, JIS 2002, API609, etc.

Connection: EN1092, ASME B16.5, JIS B2239&2220, GB/T 9119, etc.

Temperature range: -35°C to 200°C

Top flange acc.: ISO 5211

Concentric butterfly valve, vulcanized liner, wafer type.



FCVD

Concentric butterfly valve, vulcanized liner, double flange type

Nominal size: DN50 to DN1200 (48")

Face to face: DIN 3202, EN558, ISO 5752, BS 2080, JIS 2002, API609, etc.

Connection: EN1092, ASME B16.5, JIS B2239&2220, GB/T 9119, etc.

Temperature range: -35°C to 200°C

Top flange acc.: ISO 5211

Also applicable to vacuum environments.



FCVL

Concentric butterfly valve, vulcanized liner, lug type

Nominal size: DN40 to DN1200 (48")

Face to face: DIN 3202, EN558, ISO 5752, BS 2080, JIS 2002, API609, etc.

Connection: EN1092, ASME B16.5, JIS B2239&2220, GB/T 9119, etc.

Temperature range: -35°C to 200°C

Top flange acc.: ISO 5211

Also applicable to vacuum environments.



FCVU

Concentric butterfly valve, vulcanized liner, U-flange type

Nominal size: DN50 to DN1200 (48")

Face to face: DIN 3202, EN558, ISO 5752, BS 2080, JIS 2002, API609, etc.

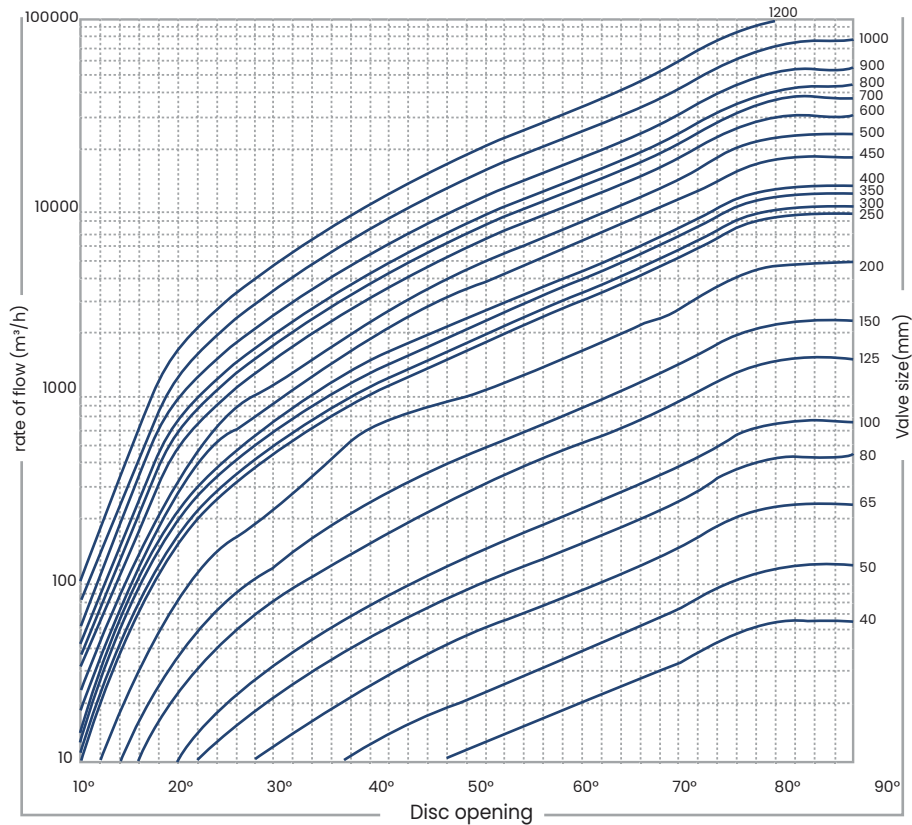
Connection: EN1092, ASME B16.5, JIS B2239&2220, GB/T 9119, etc.

Temperature range: -35°C to 200°C

Top flange acc.: ISO 5211

Also applicable to vacuum environments.

KV value



Formulae for calculation of rate flow

Liquids:

$$Q = \frac{KV}{\sqrt{\frac{PS}{\Delta P}}}$$

Q: rate of flow (m³/h)
PS: specific gravity (water=1)
ΔP: pressure drop (bar)

Gas:

$$Q = 28.5 \frac{KV}{\sqrt{\frac{PS}{P_2 \cdot \Delta P}}}$$

Q: rate of flow (m³/h)
PS: specific gravity (air=1)
ΔP: pressure drop (bar)
(less than 1/2 inlet pressure)
P₂ outlet pressure

Steam:

$$Q = 22.5 * KV \sqrt{P_2 \cdot \Delta P}$$

Q: rate of flow (kg/h)
ΔP: pressure drop (bar)
(less than 1/2 inlet pressure)
P₂ outlet pressure

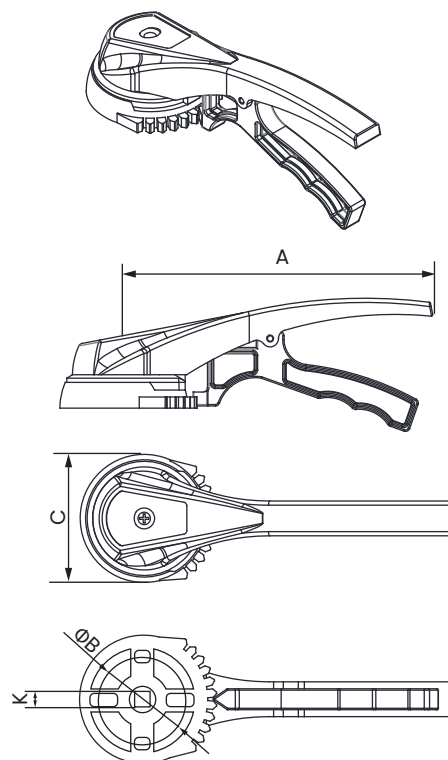
DN	Inch	KV								
		10°	20°	30°	40°	50°	60°	70°	80°	90°
DN40	1 1/2"	0	2	6	12	11	23	45	68	64
DN50	2"	0	3	9	23	21	45	67	114	127
DN65	2 1/2"	0	5	24	35	46	85	136	238	260
DN80	3"	3	9	36	54	82	147	239	425	463
DN100	4"	5	15	47	86	124	215	354	639	710
DN125	5"	6	37	79	167	273	463	762	1370	1529
DN150	6"	7	48	116	258	435	735	1219	21790	2427
DN200	8"	9	86	238	592	897	1487	2473	4446	4938
DN250	10"	13	147	424	921	1675	2809	4665	8318	9318
DN300	12"	18	165	467	1023	1861	3115	5187	9318	10357
DN350	14"	20	189	555	1218	2217	3745	6239	11210	12450
DN400	16"	28	218	458	1386	2521	4258	7084	12756	14168
DN450	18"	36	287	843	1879	3423	5467	9607	17287	19206
DN500	20"	41	376	1105	2455	4471	7534	12687	22829	25359
DN600	24"	48	473	1423	3171	5782	9728	16371	29470	32747
DN700	28"	53	579	1724	3841	6996	11787	19839	35693	39651
DN800	32"	59	655	1965	4380	7975	13439	22617	4127	45690
DN900	36"	67	828	2471	5543	10094	16991	28616	52043	57826
DN1000	40"	85	1139	3434	7682	13983	23554	39659	72125	80959
DN1200	48"	116	1537	4646	10416	18965	31936	53774	97783	109780

Handlevers



- . Robust diecasted Al-alloy gear box.
- . Open and closed positions are adjustable.

SIZE	K	A	φB	C
DN40 to 80(1 1/2"-3")	9x9	197	50	70
DN100(4")	11x11	278	70	90
DN125 to 150(5"-6")	14x14	278	70	90

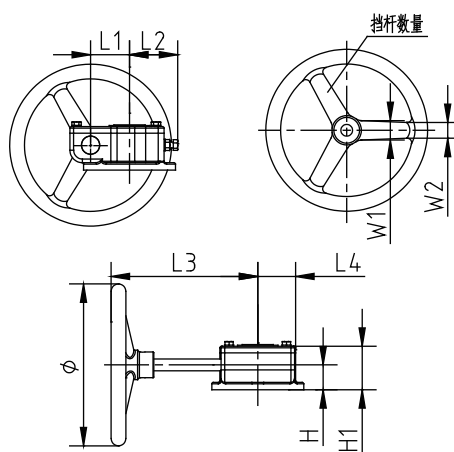


DN50 to DN500



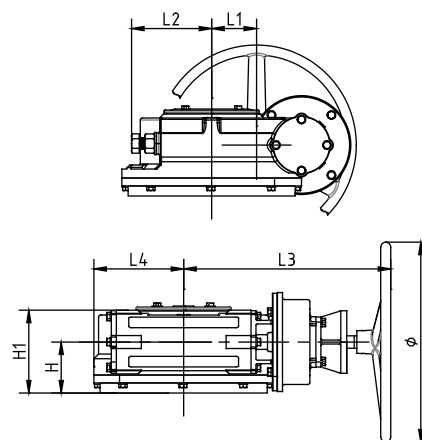
DN550 to DN700

- . Robust diecasted Al-alloy gear box.
- . Alloy gear box protection class IP65/P67.
- . Visual position indicator.
- . Stainless steel shaft and bolt.



DN50-DN500

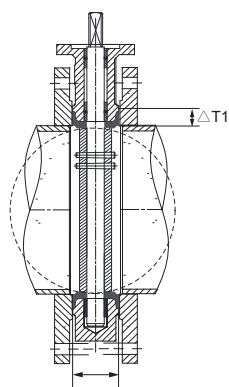
DN	Gear Ratio	H	H1	L1	L2	L3	L4	φ	W1	W2	Gear lever
DN40 to DN150(1 1/2"-6")	24:1	35	65	44	53	163	53	148.2	29	23	3
DN200 to DN250(8"-10")	30:1	43	75.1	52.5	58	202	63	270	40	32	3
DN300 to DN350(12"-14")	50:1	42	73.8	77.5	67	206.5	76	270	40	32	3
DN400 to DN450(16"-18")	50:1	51	90	80	99	260	90	278	40	34	3
DN500(20")	70:1	59	104.4	100	99	325	99	385	45	40	3
DN550 to DN600(22"-24")	184:1	59	113	62	104	255	115	385	45	40	3
DN700(28")	208:1	78	150	89	100	275	130	385	45	40	3



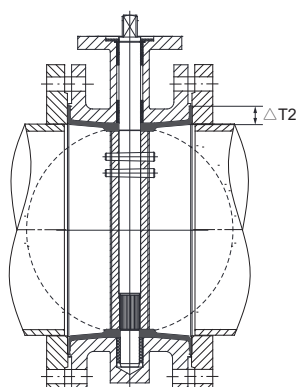
DN550-DN700

Flanges

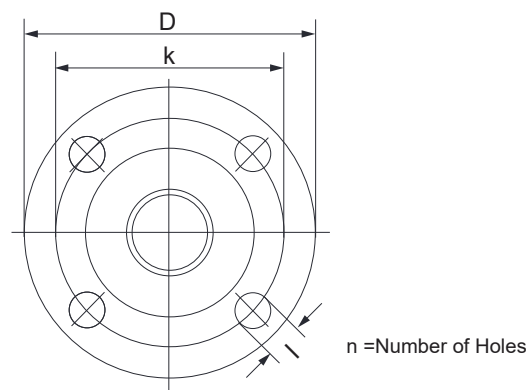
Flange Standard		DIN1092 PN 6						DIN1092 PN 10						DIN1092 PN 16						DIN1092 PN 25					
DN		D	k	n	l	△T1	△T2	D	k	n	l	T1	T2	D	k	n	l	△T1	△T2	D	k	n	l	△T1	△T2
mm	in.	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
40	1 1/2"	130	100	4	14	10	17	identical with PN 16				10	17	150	110	4	18	10	17	150	110	4	18	10	17
50	2"	140	110	4	14	13	20					13	20	165	125	4	18	13	20	165	125	4	18	13	20
65	2 1/2"	160	130	4	14	13	20					13	20	185	145	4	18	13	20	185	145	8	18	13	20
80	3"	190	150	4	18	15	20					15	20	200	160	8	18	15	20	200	160	8	18	15	20
100	4"	210	170	4	18	16	21					16	21	220	180	8	18	16	21	235	190	8	22	16	21
125	5"	240	200	8	18	16	22					16	22	250	210	8	18	16	22	270	220	8	26	16	22
150	6"	265	225	8	18	18	22					18	22	285	240	8	22	18	22	300	250	8	26	18	22
200	8"	320	280	8	18	18	23	340	295	8	22	18	23	340	295	12	22	18	23	360	310	12	26	18	23
250	10"	375	335	12	18	18	23	395	350	12	22	18	23	405	355	12	26	18	23	425	370	12	30	18	23
300	12"	440	395	12	22	20	23	445	400	12	22	20	23	460	410	12	26	20	23	485	430	16	30	20	23
350	14"	490	445	12	22	28	37	505	460	16	22	28	37	520	470	16	26	28	37	555	490	16	33	28	37
400	16"	540	495	16	22	32	37	565	515	16	26	32	37	580	525	16	30	32	37	620	550	16	36	32	37
450	18"	595	550	16	22	34	37	615	565	20	26	34	37	640	585	20	30	34	37	670	600	20	36	34	37
500	20"	645	600	20	22	34	38	670	620	20	26	34	38	715	650	20	33	34	38	730	660	20	36	34	38
600	24"	755	705	20	26	34	38	780	725	20	30	34	38	840	770	20	36	34	38	845	770	20	39	34	38
700	28"	860	810	24	26	40	40	895	840	24	30	40	40	910	840	24	36	40	40	960	875	24	42	40	40
800	32"	975	920	24	30	41	42	1015	950	24	33	41	42	1025	950	24	39	41	42	1085	990	24	48	41	42
900	36"	1075	1020	24	30	41	42	1115	1050	28	33	41	42	1125	1050	28	39	41	42	1185	1090	28	48	> 41	> 42
1000	40"	1175	1120	28	30	45	46	1230	1160	28	36	45	46	1255	1170	28	42	45	46	1320	1210	28	56	> 41	> 42
1200	48"	1450	1340	32	33	49	53	1455	1380	32	39	49	53	1485	1390	32	48	49	53	1530	1420	32	56	> 41	> 42



Wafer, lug, U-flange type



Double-flange type

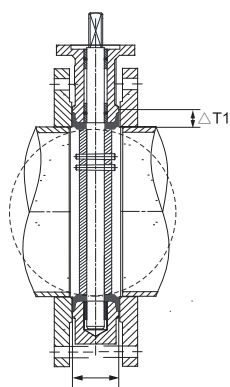


n =Number of Holes

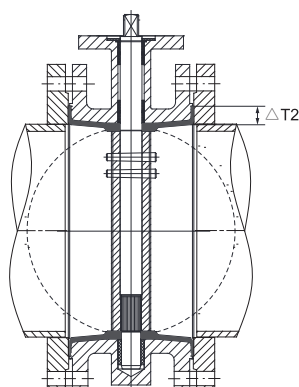
Flange Standard	GB/T9119 PN 6						GB/T9119 PN 10						GB/T9119 PN 16						GB/T9119 PN 25						
DN		D	k	n	l	△T1	△T2	D	k	n	l	△T1	△T2	D	k	n	l	△T1	△T2	D	k	n	l	△T1	△T2
mm	in.	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
40	1 1/2"	130	100	4	14	10	17	identical with PN 16				10	17	150	110	4	18	10	17	150	110	4	18	10	17
50	2"	140	110	4	14	13	20					13	20	165	125	4	18	13	20	165	125	4	18	13	20
65	2 1/2"	160	130	4	14	13	20					13	20	185	145	4	18	13	20	185	145	8	18	13	20
80	3"	190	150	4	18	15	20					15	20	200	160	8	18	15	20	200	160	8	18	15	20
100	4"	210	170	4	18	16	21					16	21	220	180	8	18	16	21	235	190	8	22	16	21
125	5"	240	200	8	18	16	22					16	22	250	210	8	18	16	22	270	220	8	26	16	22
150	6"	265	225	8	18	18	22					18	22	285	240	8	22	18	22	300	250	8	26	18	22
200	8"	320	280	8	18	18	23	340	295	8	22	18	23	340	295	12	22	18	23	360	310	12	26	18	23
250	10"	375	335	12	18	18	23	395	350	12	22	18	23	405	355	12	26	18	23	425	370	12	30	18	23
300	12"	440	395	12	22	20	23	445	400	12	22	20	23	460	410	12	26	20	23	485	430	16	30	20	23
350	14"	490	445	12	22	28	37	505	460	16	22	28	37	520	470	16	26	28	37	555	490	16	33	28	37
400	16"	540	495	16	22	32	37	565	515	16	26	32	37	580	525	16	30	32	37	620	550	16	36	32	37
450	18"	595	550	16	22	34	37	615	565	20	26	34	37	640	585	20	30	34	37	670	600	20	36	34	37
500	20"	645	600	20	22	34	38	670	620	20	26	34	38	715	650	20	33	34	38	730	660	20	36	34	38
600	24"	755	705	20	26	34	38	780	725	20	30	34	38	840	770	20	36	34	38	845	770	20	39	34	38
700	28"	860	810	24	26	40	40	895	840	24	30	40	40	910	840	24	36	40	40	960	875	24	42	40	40
800	32"	975	920	24	30	41	42	1015	950	24	33	41	42	1025	950	24	39	41	42	1085	330	24	48	41	42
900	36"	1075	1020	24	30	41	42	1115	1050	28	33	41	42	1125	1050	28	39	41	42						
1000	40"	1175	1120	28	30	45	46	1230	1150	28	36	45	46	1255	1170	28	42	45	46						
1200	48"	1405	1340	32	33	49	53	1455	1380	32	39	49	53	1485	1390	32	48	49	53						

Flanges

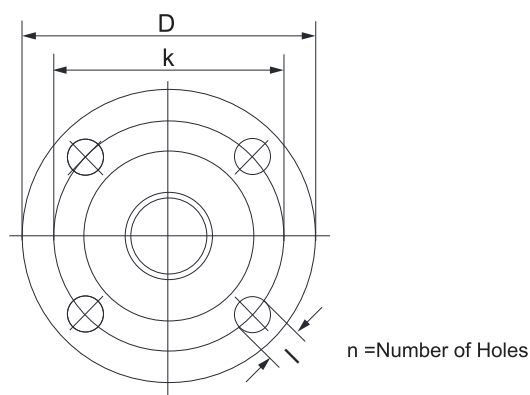
Flange Standard		ANSI B 16.5 150 lb/sq. in									ANSI B 16.5 300 lb/sq. in.								
DN		D		k		n	l		ΔT1	ΔT2	D		k		n	l		ΔT1	ΔT2
mm	in.	mm	in.	mm	in.		mm	in.	mm	mm	mm	in.	mm	in.		mm	in.	mm	mm
40	1 1/2"	127	5"	98.4	3 ¾"	4	15.9	5/8"	14	16.075	155.6	6 1/8"	114.3	4 3/4"	4	22.2	3/4"	14	16.075
50	2"	152.4	6"	120.7	4 3/4"	4	19	3/4"	17.7	19.65	165.1	6 1/2"	127	5"	8	19	3/4"	17.7	19.65
65	2 1/2"	177.8	7"	139.7	5 1/2"	4	19	3/4"	20.65	20.9	190.5	7 1/2"	149.2	5 7/8"	8	22.2	7/8"	20.6	20.9
80	3"	190.5	7 1/2"	152.4	6"	4	19	3/4"	21	24.5	209.6	8 1/4"	168.3	6 5/8"	8	22.2	7/8"	21	24.5
100	4"	228.6	9"	190.5	7 1/2"	8	19	3/4"	22.4	27.25	254	10"	200	7 8/8"	8	22.2	7/8"	22.4	27.25
125	5"	254	10"	215.9	8 1/2"	8	22.2	7/8"	22.35	28.7	279.4	11"	235	9 1/4"	8	22.2	7/8"	22.35	28.7
150	6"	279.4	11"	241.3	9 1/2"	8	22.2	7/8"	25.9	30.85	317.5	12 1/2"	269.9	10 5/8"	12	22.2	7/8"	25.9	30.85
200	8"	342.9	13 1/2"	298.5	11 3/4"	8	22.2	7/8"	27.15	33.5	381	15"	330.2	13"	12	25.4	1"	27.15	33.5
250	10"	406.4	16"	361.9	14 1/4"	12	25.4	1"	28.75	34.65	444.5	17 1/2"	387.3	15 1/4"	16	28.6	1 1/8"	28.75	34.65
300	12"	482.6	19"	431.8	17"	12	25.4	1"	31.6	38.1	520.7	20 1/2"	450.8	17 3/4"	16	31.7	1 1/4"	31.6	38.1
350	14"	533.4	21"	476.2	18 3/4"	12	28.6	1 1/8"	> 32	> 39	584.2	23"	514.3	20 1/4"	20	31.7	1 1/4"	> 32	> 39
400	16"	596.9	23 1/2"	539.7	21 1/4"	16	28.6	1 1/8"	> 32	> 39	647.7	25 1/2"	571.5	22 1/2"	20	34.9	1 3/8"	> 32	> 39
450	18"	635	25"	577.9	22 3/4"	16	31.7	1 1/4"	> 32	> 39	711.2	28"	628.7	24 3/4"	24	34.9	1 3/8"	> 32	> 39
500	20"	698.5	27 1/2"	635	25	20	31.7	1 1/4"	> 32	> 39	774.7	30 1/2"	685.8	27"	24	34.9	1 3/8"	> 32	> 39
600	24"	812.8	32"	749.3	29 1/2"	20	34.9	1 3/8"	> 32	> 39	914.4	36"	812.8	32"	24	41.3	1 5/8"	> 32	> 39



Wafer, lug, U-flange type



Double-flange type



n = Number of Holes

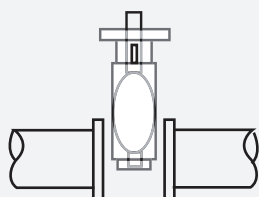
Flange Standard		JIS 5K							JIS 10K							JIS 16K						
DN		D	k	n	l	$\Delta T1$	$\Delta T2$		D	k	n	l	$\Delta T1$	$\Delta T2$		D	k	n	l	$\Delta T1$	$\Delta T2$	
mm	in.	mm	mm		mm	mm	mm		mm	mm		mm	mm	mm		mm	mm		mm	mm	mm	
40	1 1/2"	120	95	4	15	10	14		140	105	4	19	10	17		140	105	4	19	10	17	
50	2"	130	105	4	15	13	13		155	120	4	19	13	19		155	120	8	19	13	20	
65	2 1/2"	155	130	4	15	13	17		175	140	4	19	13	21		175	140	8	19	13	20	
80	3"	180	145	4	19	15	18		185	150	8	19	15	20		200	160	8	23	15	20	
100	4"	200	165	8	19	16	15		210	175	8	19	16	20		225	185	8	23	16	21	
125	5"	235	200	8	19	16	19		250	210	8	23	16	22		270	225	8	25	16	22	
150	6"	265	230	8	19	20	22		280	240	8	23	20	24		305	260	12	25	20	24	
200	8"	320	280	8	23	20	19		330	290	12	23	20	24		350	305	12	25	20	25	
250	10"	385	345	12	23	21	25		400	355	12	25	21	27		430	380	12	27	21	27	
300	12"	430	390	12	23	24	22		445	400	16	25	24	27		480	430	16	27	24	27	
350	14"	480	435	12	25	29	23		490	445	16	25	29	28		540	480	16	33	29	38	
400	16"	540	495	16	25	33	28		560	510	16	27	33	33		605	540	16	33	33	38	
450	18"	605	555	16	25	35	33		620	565	20	27	35	35		675	605	20	27	35	38	
500	20"	655	605	20	25	36	32		675	620	20	27	36	37		730	660	20	33	36	39	
600	24"	770	715	20	27	36	34		795	730	24	33	36	39		845	770	24	39	36	40	
700	28"	875	820	24	27	40	35		905	840	24	33	40	40								
800	32"	995	930	24	33	41	37		1020	950	28	33	41	42								
900	36"	1092	1030	24	33	41	36		1120	1050	28	33	41	41								
1000	40"	1195	1130	28	33	45	35		1235	1160	28	39	45	45								
1200	48"	1420	1350	32	33	48	41		1465	1380	32	39	48	51								

Installation precautions

Figure 1 – Insert Resilient Seated Butterfly Valve Between Flanges.



INCORRECT INSTALLATION
Pipe not spread, disc opened beyond valve body face; Results; Disc edge damaged when it hits pipe flange.



CORRECT INSTALLATION
Pipe spread and aligned, disc rotated; Results; no undesirable beginning seating/ unseating torque, disc edge protected.

Figure 2 – Flange Bolt Tightening Pattern.

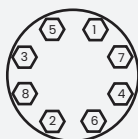
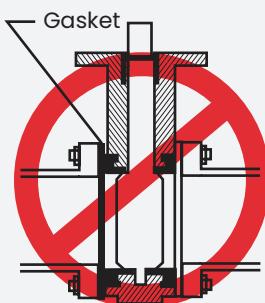
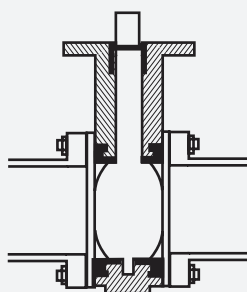


Figure 3 – Initial Centering & Flanging of Valve.

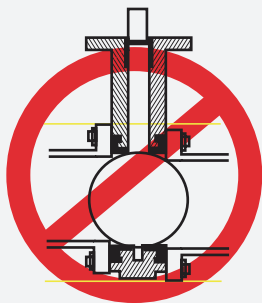


INCORRECT INSTALLATION
Disc in closed position; gaskets used; Results Seat distorted and over compressed causing high initial unseating torque problems.

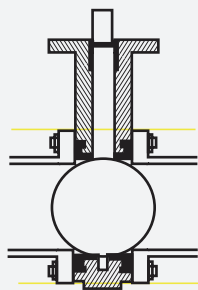


CORRECT INSTALLATION
Bolts snugged, not torqued tight, disc edge within body face-to-face but not fully closed, no flange gaskets; Results: No disc edge damage, proper sealing allowed.

Figure 4 – Final Aligning & Tightening of Flange Bolts



INCORRECT INSTALLATION
Piping misaligned; Results Disc O.D. strikes pipe I.D. causing disc edge damage, increased torque & leakage. Seat face o-rings will not seal properly with incorrectly aligned piping.



CORRECT INSTALLATION
Piping aligned properly when bolts tightened, disc in full open position; Results – disc clears adjacent pipe I.D., seat face seals properly, no excessive initial torque.

Installation Procedure

The valves shall never be installed where service conditions could exceed the valve ratings concerning pressure, temperature or operating media. Failure to comply with this warning may result in personal injury or property damage.

General Installation

- a.** Make sure the pipeline and pipe flange faces are clean. Any foreign material such as pipe scale, metal chips, welding slag, welding rods, etc., can obstruct disc movement or damage the disc or seat.
- b.** The Floeriner elastomer seat has molded o-rings on the face of the seat. As a result, no gaskets are required as these o-rings serve the function of a gasket.
- c.** Align the piping and then spread the pipe flanges a distance apart so as to permit the valve body to be easily dropped between the flanges without contacting the pipe flanges.
- d.** Check to see that the valve disc has been positioned to a partially open position, with the disc edge about 1/2 inch to 3/8 inch inside the face of the seat, (approximately 10° open).
- e.** Insert the valve between the flanges as shown in figure 1, taking care not to damage the seat faces. Always pick the valve up by the locating holes or by using a nylon sling on the neck of the body.
- f.** Place the valve between the flanges, center it, and then span the valve body with all flange bolts, but do not tighten the bolts.

Carefully open the disc to the full open position, making sure the disc does not hit the adjacent pipe I.D. Now systematically remove jack bolts or other flange spreaders, and hand-tighten the flange bolts as shown in Figure 2 below.

Very slowly close the valve disc to ensure disc edge clearance from the adjacent pipe flange I.D.

Now open the disc to full open and tighten all flange bolts per specification as shown in Figure 2. Finally, repeat a full close to full open rotation of the disc to ensure proper clearances (See figures 3 & 4).

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APPENDICES

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