LIMANNTECH

ISO 14001 ISO 9001 UKAS QUALITY MANAGEMENT




ACE VALVE

ACE VALVE COMPANY LIMITED
http://www.acevalve.co.kr

2023 Edition

Contents

General Introduction

COMPANY PROFILE

Company Name

·ACE VALVE COMPANY LIMITED

Head Office & Factory

·1-12, Somang-gil, Juchon-myun, Gimhae-si,
Gyeongsangnam-do, Korea
TEL : +82-55-310-8000 FAX : +82-55-329-0656~8
E-mail:acevalve@acevalve.co.kr
Http://www.acevalve.co.kr

Main Products

· Double Eccentric Metal Seated Butterfly Valve with Linear Lifting Stem & Disc
· Triple Eccentric Metal Seated Butterfly Valve
· High-Performance Butterfly Valve
· Double Eccentric Disc Seated Butterfly Valve
· Double Eccentric Cargo Oil Butterfly Valve
· Concentric Butterfly Valve
· Ball Valve
· Cryogenic Butterfly Valve
· Cryogenic Ball, Gate, Globe and Check Valve
· Gate, Globe and Check Valve (API)
· Resilient Seated Gate Valve
· Air Vacuum Relief Valve
· On-off and Control Valve
· Other Special Valves
· Pipe Couplings, Dismantling joint

Brief History

We make every possible effort to develop valves with technological innovation for resistant to corrosion of high quality and high efficiency ceaselessly

2000	Apr.	Established as Ace Valve Company Limited.
	Aug.	Qualified by BVQI for ISO 9001.
		Registered on AVL of Hyundai Heavy Industries Co., Ltd. in Korea.
2001	Aug.	Registered on AVL of Hitachi Zosen Corporation in Japan.
	Sep.	Registered on AVL of Samsung Heavy Industries Co., Ltd. in Korea
	Oct.	Registered on AVL of Daewoo Shipbuilding & Marine Engineering Co., Ltd. in Korea.
	Nov.	Registered on AVL of STX Shipbuilding Co., Ltd. in Korea.
	Dec.	Registered on AVL of Great Man-Made River Authority in Libya.
		Obtain Fire Safe Type Approval Certificate by DNV for Butterfly Valves.
2002	Mar.	Registered on AVL of Universal shipbuilding Corporation in Japan.
	Jun.	Designated as an Superior Exporting Firm by Korea Authority.
	Jul.	Delivered 2400mm 24Bar Butterfly Valve to GMRA.
		Designated as an Excellent Inno-Biz Firm by Korea Authority.
		Delivered LNG Cryogenic Butterfly Valve to Osaka Valve.
2003	Feb.	Obtain Type Approval Certificate by DNV.
	May.	Obtain Type Approval Certificate by ABS.
		Approved by Exxon Mobil as an Official Vendor of Butterfly Valves.
2004	Feb.	Obtain ISO 9001 with 2000 Edition From BVQI.
	Mar.	Delivered Air Vacuum Relief Valve and Fittings to GMRA.
	Jul.	Obtain Type Approval Certificate by Bureau Veritas.
	Nov.	Registered on AVL of Doosan Heavy Industries & Construction Co., Ltd. in Korea.
2005	Feb.	Registered on AVL of Mitsubishi Heavy Industries in Japan.
	Mar.	Qualified by Bvqi for ISO 14001.
	Oct.	Registered on AVL of Korea Power Co., Ltd.(KOSPO, KOWEPO, KOMIPO, EWP, KOSEP) in Korea.
2006	Jan.	Registered on AVL of Ministry of Energy State of Kuwait (Mew) in Kuwait.
	Mar.	Registered on AVL of Fisia Italimpianti S.P.A in Italy.
	Apr.	Obtain official Approval for Research & Development Institute From Authority.
	Sep.	Registered on AVL of Saudi Aramco in KSA
	Dec.	Developed Globe Valve for LPG.
2007	May.	Delivered Triple Eccentric Metal Seat Butterfly Valve.
		Delivered Mechanical Coupling PN25 x 2400mm for GMRA Project.
	Sep.	Registered on AVL of Kuwait Oil Company in Kuwait.
	Oct.	Designated as Developer Cryogenic Globe Valve for LNG by Korea Ministry.
	Nov.	Approved as official Vendor by Kuwait National Petroleum Company.
		Registered on AVL of POSCO Engineering & Construction Co., Ltd. in Korea.
2008	Jan.	Obtain CE Mark Certificate.
	Apr.	Registered on AVL of Samsung Engineering Co., Ltd. in Korea.
	Jun.	Obtain API Monogram for API 609.
	Jul.	Technology Transfer of Valve Remote Operating System for
		Integreted Electro-Hydraulic Actuator From Hyundai Heavy Industries Co., Ltd.
2009	Jan.	Obtain Gost-R Certificate.
	Mar.	Developed Class 2500 Triple Eccentric Metal Seated Butterfly Valve.
	Mar.	Registered on AVL of Hyundai Engineering & Construction Co., Ltd. in Korea.
	Apr.	Registered on AVL of GS Engineering & Construction Corporation in Korea.
		Delivered 1050mm (LNG Cryogenic) / 1500mm Triple Eccentric Metal Seated Butterfly Valve.
	Jun.	Delivered Butterfly Valves for U.K. Aircraft Carrier (CVF Carrier).
	Oct.	Registered on AVL of Daerim Industrial Co.,Ltd. in Korea.
	Nov.	Approved by Hyundai Heavy Industries as Valve Remote Operating System Manufacturer.
	Dec.	Developed Valve Remote Operating System.
		Obtain ISO 9001 with 2008 Edition.
2010	Jan.	Delivered Valve Remote Operating System with Sungdong of 158K Crude Oil Tanker for TSAKOS.
		Registered on AVL of GASCO in UAE.
	Aug.	Delivered Gate, Butterfly and Swing Check Valve for GASCO Ruwais 4th Ngl Train Project.
	Dec.	Delivered Ball, Gate, Check, Globe and Butterfly Valve for Takreer Seawater Intake-3 Project.
2011	Jun.	Obtain ASME 'N' & 'NPT' Stamp.
		Obtain Ball Valve Fire Safe Type Approval Certificate.
	Jul.	Contracted Shutdown Ball Valve for South Pars Gas Filed on-Shore Project.
	Sep.	Contracted Motorized Ball Valve for Foroozan offshore Project.
2012	May.	Obtain API-6D Monogram for Ball, Gate, Check Valve.
		Contracted Ball, Gate, Globe, Check and Butterfly Valve for South Pars Gas Field On-Shore Project.
	July.	Designated by Korean Authority as a Developer for Subsea Valve (Sil 3 / 3000M Sea Depth) Reserch and Development Project.
	Dec.	Awarded The Gold Tower Order of Industrial Service Merit.
2013	Jun.	Registered on AVL of NIOEC in Iran.
		Registered on AVL of IOOC in Iran.
	Jul.	Obtain Type Approval Certificate for Cryogenic Globe, Gate, Swing Check, Ball and Butterfly valves by Lloyd's
		Obtain Type Approval Certificate for Cryogenic Globe, Gate, Check, Ball and Butterfly valves by ABS
	Nov.	Obtain UL Certificate for Concentric, High performance type Butterfly valves.
2014	Jan.	Approved as Official Vendor by ADMA-OPCO in U.A.E.
	Feb.	Registered on AVL of Ma'aden in KSA.
	Apr.	As Official Vendor by ZADCO in U.A.E
	Jul.	Obtain UL Certificate for Post Indicator Valve.
	Aug.	Registered on AVL of SABIC in KSA.
		Designated by Korean Authority as a Manufacturer for Floating Offshore LNG Bunkering System Project
	Dec.	Registered on AVL of Marafiq in KSA.
2015	Jan.	Registered on AVL of SEC(Saudi Electricity Company) in KSA.
	Aug.	Approved & Registered on AVL of KOTC in Kuwait.
	Sep.	Approved & Registered on Fluor in USA.
	Oct.	Approved & Registered on S-Oil in Korea.
		Obtain SIL Certificate from TUV.
2016	Jun.	Obtain Fugitive Emission Test Certificate for Ball valve.
		Obtain KC Certificate for Butterfly valve.
	Jul.	Approved as Official Vendor by Petroleum Development Oman (PDO) in Oman.
		Obtain SIL Certificate for Gate valve from TUV.
		Registered on AVL of Hanwha Total in Korea.
	Aug.	Obtain SIL Certificate for Check valve from TUV.
		Obtain TAT Certificate for High performance type Butterfly valve.
		Registered on AVL of Hanwha Techwin in Korea.
	Sep.	Obtain TAT Certificate for Triple type Butterfly valve.
	Dec.	Signed MOU for R&D and Educational Cooperation in the Fields of Maritime offshore Infrasturctures and Renewable Energy Technologies with TNO in Netherlands.
		Signed Technical License Agreement for LNG Transfer System with KANON in Netherlands.
2017	Apr.	Obtain TAT Certificate for Triple Eccentric Butterfly valve.
	Jun.	Obtain Type Approval Certificate for Cryogenic valves from BV.
	Nov.	Obtain Fire Test Certificate for Ball valve, Dual Check valve.
2019	May.	Signed Contact of investment With DTI Investment.
	Jun.	Obtain TAT Certificate for Concentric Butterfly valve.
	Jul.	Obtain Type Approval Certificate for Cryogenic valves from BV.
2020	Jul.	Developed ERS(Emergency Release System) for LNG Loading ARM.
2021	Jan.	Developed Double Eccentric type Cryogenic Butterfly valve.
	May.	Developed Pinless type Butterfly valve.

ACE VALVE PRODUCTS

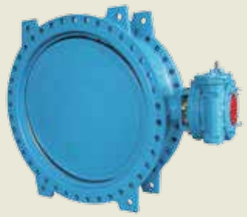
▲ AV-M Series
Double Eccentric Metal Seated Butterfly Valve with Linear Lifting Stem & Disc

▲ AV-TM Series
Triple Eccentric Metal Seated Butterfly Valve

▲ AV-H and F Series
High-performance Butterfly Valve

▲ AV-B Series
Floating type Ball Valve

▲ AV-B Series
Trunnion type Ball Valve



▲ AV-E Series
Disc Seated Butterfly Valve

▲ AV-O Series
Double Eccentric Cargo Butterfly Valve

▲ AV-C Series
Concentric Butterfly Valve

▲ AV-L Series
Cryogenic LNG Butterfly Valve

▲ AV-L Series
Cryogenic Ball Valve

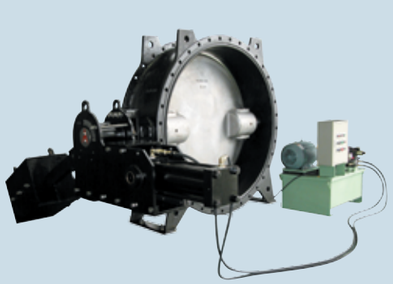
▲ AV-L Series
Cryogenic Gate Valve

▲ AV-L Series
Cryogenic Globe Valve

▲ AV-L Series
Cryogenic Swing Check Valve

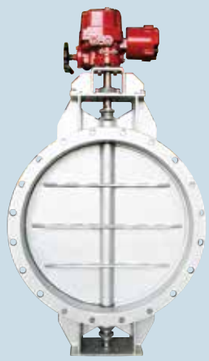
▲ AV-S Series
Gate Valve

▲ AV-G Series
Globe Valve



▲ AV-CK Series
Combined Check Valve

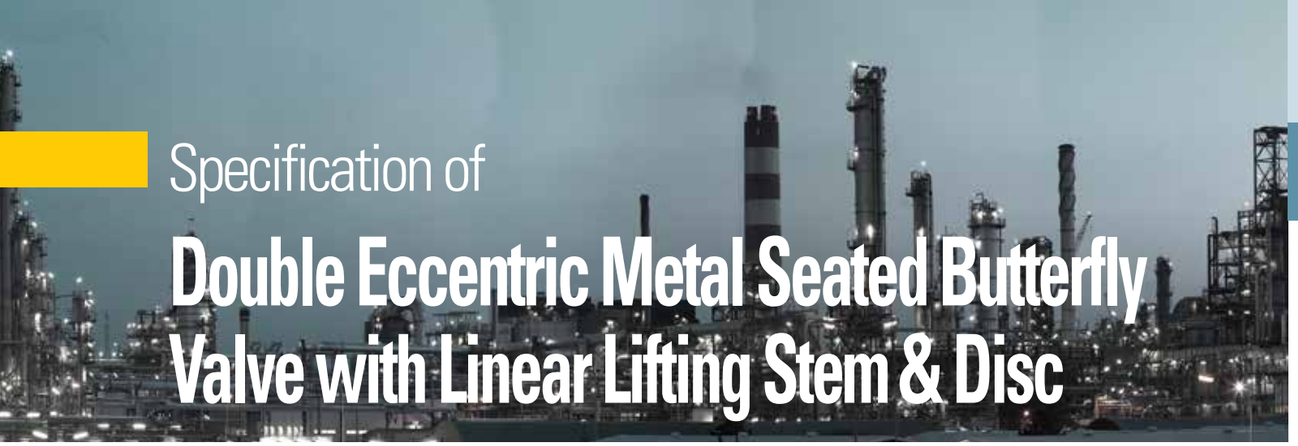
▲ AV-K Series
Dual Disc Check Valve



▲ AV-D Series
Damper Valve

▲ AV-A Series
Air Valve

▲ AV-CP Series
Flexible Coupling

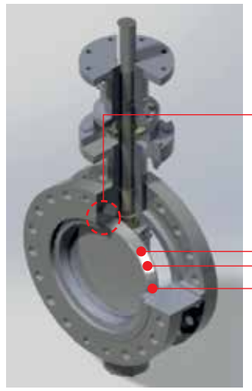


Specification of

Double Eccentric Metal Seated Butterfly Valve with Linear Lifting Stem & Disc

KEY FEATURES

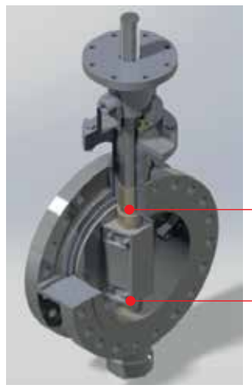
- Double Eccentric Design
- Linear Lifting Stem/Disc Design inducing Zero Friction of Disc & Seat surfaces
- Solid Metal to Metal Seat with hard facing as a basic trim design, Metal to Soft Seat as an option
- Super Fine Seat Face roughness by state-of-the-art machining
- Cutting Edge Seal Technology across the entire seat face
- Replaceable Metal Seat with Retainer
- Origin in South Korea exclusive



◆ Retainer Ring features(**see below details "A"**) SEGMENT RING TYPE
Prevents deformation of retainer ring caused by internal pressure of the valve.

◆ Disc & Sealing surface roughness TCC coating or Stellite over ray
After coating, polishing and lapping treatment surface roughness
With super fine surface. (**see below details "B"**)

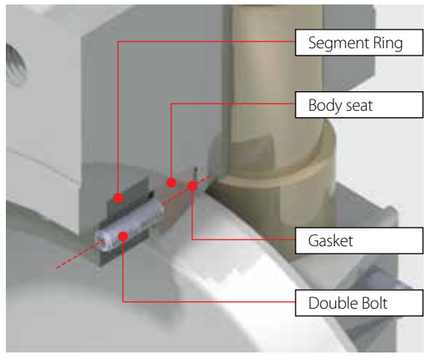
◆ Disc & Seat surfaces zero friction
Solid Metal to Metal Sealing Available.
Can be used at high pressure by realizing sealing strength according to the working pressure (**see below details "C"**)



◆ The valve Disc Position is controlled by upper & lower Bushes Inserted Into the body
No disc down by valve operation
Can be maintained in initial conditions without change due to valve installation (**see below details "D"**)

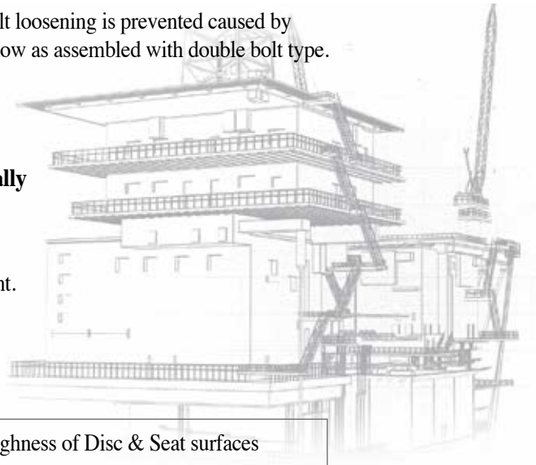
Double Eccentric Metal Seated Butterfly Valves

◆ **Detail "A"**



Segment Ring type

- Centerlines of bolts and gaskets are the same
- No leakage occurs through gasket because the sealing of gasket does not deteriorate even though any forces are exerted on the retainer ring with the disc due to internal pressure
- Any bolt loosening is prevented caused by fluid-flow as assembled with double bolt type.

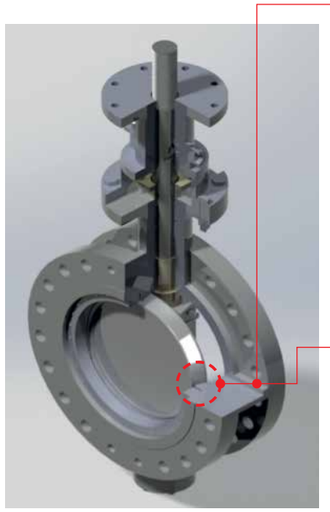


◆ **Detail "B"**

Double Eccentric valve is designed Metal to Metal seat Basically

- Both Disc & Seat are hard facing
  - Increasing wear resistance and durability.
  Laminated or PTFE seat is available depend on client's requirement.
- After coating, each Disc & Seat is Polished.
- One-to-one lapping of Disc & Seat after polishing
  - Super fine seats surface roughness

◆ Surface roughness of Disc & Seat surfaces
- Hard facing on disc & seat
- Perform polishing and rapping after coating, and maintaining



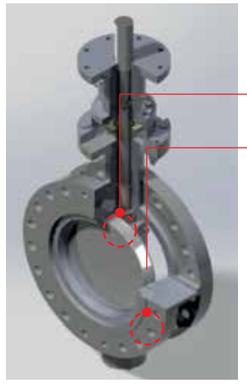
Super fine surface roughness

Double Eccentric Metal Seated Butterfly Valves

◆ Detail “C”

Disc & Seat surfaces zero friction

▶ Friction free of seating surfaces from before disc rotating
- Interference is eliminated because valve disc moves in a linear before the Open/Close rotation and then performs with rotation acts.

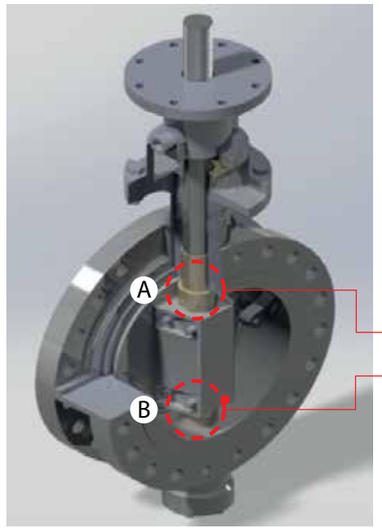


◆ Disc & Seat surfaces zero friction
- ▶ Solid Metal to Metal Sealing Basically.
- ▶ Can be used at high pressure by realizing sealing strength according to the working pressure.

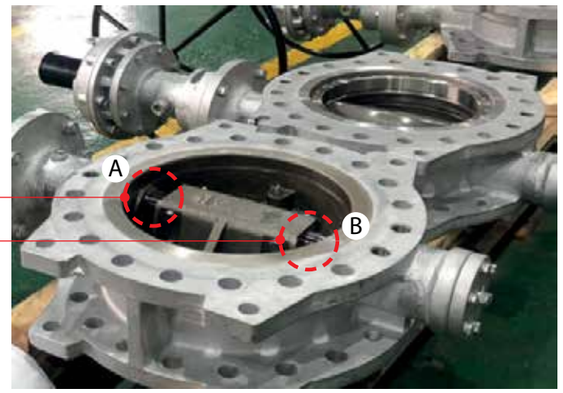
- The Triple offset problem is that "zero interference" cannot be implemented by design because it is "impossible to zero cumulative tolerances"
- The double eccentric with linear lifting stem & disc design is designed to allow the valve to implement the "Zero Interference" of the disc and sealing parts while at the same time absorbing the tolerances generated by the "machining and assembly", thus 100% solving the problems that arise with the existing Triple offset.

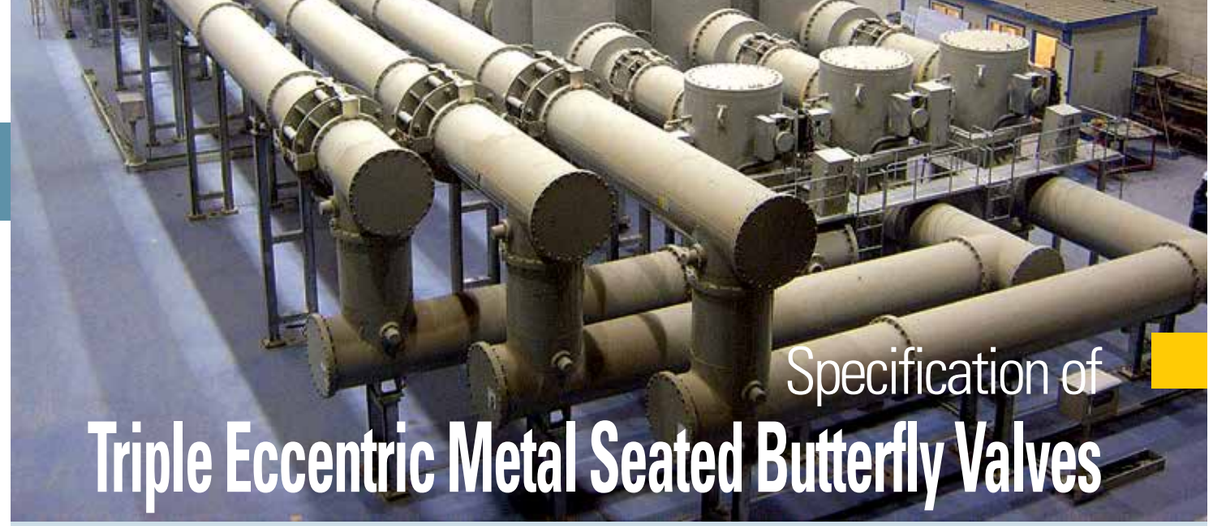
◆ Detail “D” [Disc position controlling by Upper & Lower Bush]

▶ The upper and lower bushes are inserted into the positions of A and B indicated in the below pictures To control the movement of disc caused by load + rotational thrust when the valve is operated, Thereby maintaining perfect sealing ability.



- ▶ The valve disc position is controlled by the Upper and Lower Bush inserted into the Valve body.
- ▶ No disc move by valve operation.
- ▶ Can be maintained in initial conditions without change due to valve installation.





Specification of Triple Eccentric Metal Seated Butterfly Valves

Triple eccentric metal seated butterfly valves are widely used in plant and high pressure piping system.
The metal seat shall be consisted of laminated seat or solid seat.
The valve shall be capable of bi-directional flow bubble tight shut-off at full rated pressure.

TYPE NUMBERING SYSTEM

- AV-TMW Triple Eccentric wafer type metal seated butterfly valves.
- AV-TML Triple Eccentric lug type metal seated butterfly valves.
- AV-TMF Triple Eccentric flange type metal seated butterfly valves.

STANDARD COMPLIANCE

- The face to face dimension shall be in accordance with API 609, ISO 5752, AWWA, BS, JIS/KS.
- Fire safe design shall be in accordance with API607.

PRODUCTION RANGE

- SIZE : DN 50mm (2 inch) ~ DN 5000mm (200 inch)
- WORKING PRESSURE : Up to 300 bar depend on related size
- WORKING TEMPERATURE : -196°C ~ +815°C

APPLICABLE FLANGE

- KS/JIS 5K, 10K, 16K, 20K, 30K, 40K, 63K
- ASME B 16.5, 16.47 Class 150LB, 300LB, 600LB, 900LB, 1500LB, 2500LB
- EN 1092 PN6, PN10, PN16, PN25, PN40, PN63
- ISO 7005 PN6, PN10, PN16, PN20, PN25, PN40

Application

- Petroleum refinery
- Fossil power plants
- Petrochemical plants
- Firesafe line
- Nuclear power plants
- Cryogenic services
- Exhaust gas line & Steam line

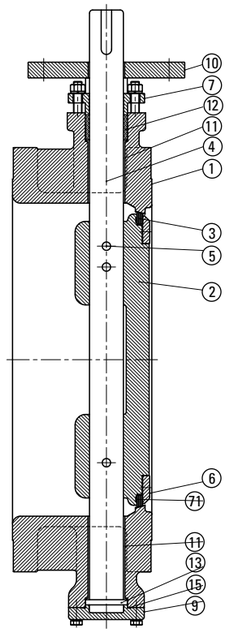
Classification by Connection

- WAFER : The valve to be installed with long bolts between the flanges at adjacent pipe without flange on the valve.
- LUG : A pair of thread bolt holes to be provided upper and lower side in order to hold the valve.
- FLANGE : Both end with complete flange suitable to connect with general pipe flange.

Operations

The various operator of the valve is available depend on the valve location, driving medium and dedicated service of the valve to be provided.

- Manual worm gear operation
- Single or double acting pneumatic actuator operation
- Hydraulic actuator operation
- Electric motor actuator operation



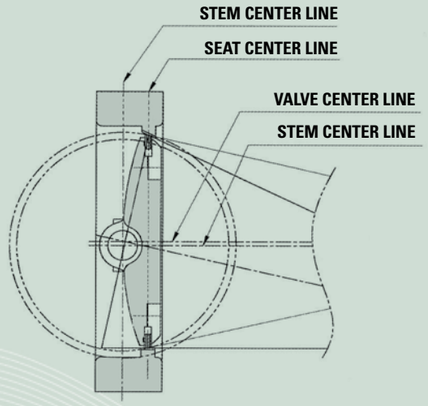
Part List

No	PART NAME	METERIAL
1	BODY	CAST STEEL / STAINLESS STEEL / NI-AL-BRONZE
2	DISC	CAST STEEL / STAINLESS STEEL / NI-AL-BRONZE
3	SEAT	STAINLESS STEEL + GRAPHITE LAMINATED STAINLESS STEEL / MONEL
4	STEM	STAINLESS STEEL / MONEL
5	DISC PIN	STAINLESS STEEL / MONEL
6	RETAINER	CAST STEEL / STAINLESS STEEL / NI-AL-BRONZE
7	PACKING GLAND	CAST STEEL / STAINLESS STEEL / NI-AL-BRONZE
9	BOTTOM COVER	CAST STEEL / STAINLESS STEEL / NI-AL-BRONZE
10	ACTUATOR STAND	CARBON STEEL
11	STEM BEARING	STAINLESS STEEL + TEFLON STAINLESS STEEL / BRONZE / INCONEL
12	PACKING	GRAPHITE
13	THRUST PLATE	STAINLESS STEEL + TEFLON STAINLESS STEEL / BRONZE / INCONEL
15	BOTTOM GASKET	GRAPHITE
71	SEAT GASKET	GRAPHITE

Triple Eccentric Metal Seated Butterfly valves

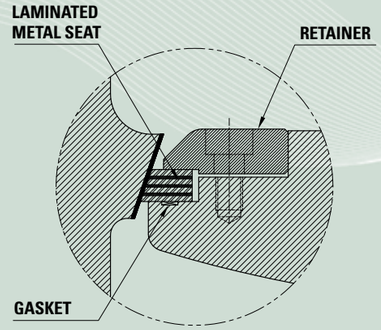
Triple eccentric design principle

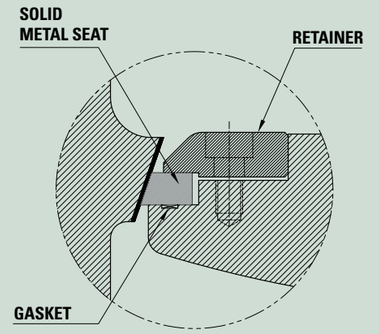
Metal seated high pressure butterfly valves provide bi-directional bubble tight shut off which achieved by introducing state of the triple eccentric disc geometry.
The valve shaft is off set against the seat and the center line of the valve body respectively. The seating edges are machined with a continuously changing slope from an angle on top of the oval seat ring to an angle at the opposite side. This geometry ensures that the seat ring stays clear of the seat except at the final shut off position which results long life seat.



Metal to metal seat

Various disc seals are available for each temperature and pressure service applications. Solid metal seals are often used for temperatures above 510°C and up to 815°C or low temperature service. The laminated metal seal consisted of stainless steel with intermediate material of graphite or ceramic fiber layers is used widely. The laminated seal is secured to the disc with a bolt-on stainless steel retainer and easily accessible for replacement. The graphite laminated seal Ring is suitable for temperatures between -40°C and 650°C in general. The seal leakage meets API 598 or API 6D.
The solid metal seating valve can be operated in a temperature range of -253°C to +815°C.
Valve for cryogenic application shall be provided with extended stem.

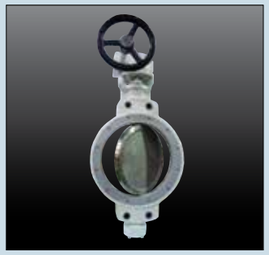




Specification of

High-Performance Butterfly Valves

High performance butterfly valves are widely used in product and chemical tankers, offshore / on shore to NACE MR0175, oil and gas field chemical, petrochemical plants, and high pressure piping systems. The valves are complied with API 607 fire safety standards. Adoption of a spring-loaded soft PTFE seat gives flexibility and secures long life, even with frequent operation.
The soft seated valve shall be capable of bi-directional flow and provide bubble tight shut-off at full rated pressure.



TYPE NUMBERING SYSTEM

- AV-HWR High-performance WAFER type Rubber seat Butterfly valves
- AV-HSR High-performance SEMI-LUG type Rubber seat Butterfly valves
- AV-HLR High-performance LUG type Rubber seat Butterfly valves
- AV-HFR High-performance FLANGE type Rubber seat Butterfly valves
- AV-HWT High-performance WAFER type Teflon seat Butterfly valves
- AV-HST High-performance SEMI-LUG type Teflon seat Butterfly valves
- AV-HLT High-performance LUG type Teflon seat Butterfly valves
- AV-HFT High-performance FLANGE type Teflon seat Butterfly valves
- AV-FHW High-performance WAFER type Fire safe seat Butterfly valves
- AV-FHS High-performance SEMI-LUG type Fire safe seat Butterfly valves
- AV-FHL High-performance LUG type Fire safe seat Butterfly valves
- AV-FHF High-performance FLANGE type Fire safe seat Butterfly valves

STANDARD COMPLIANCE

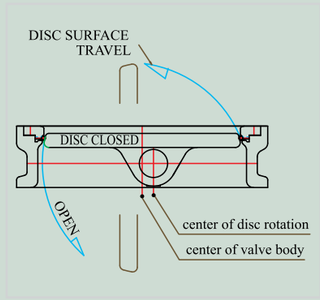
- The face to face dimension shall be in accordance with API 609, ISO 5752, KSV 7490, JIS F 7480, BS 5155 or MSS SP-68.

PRODUCTION RANGE

- SIZE : DN 50mm (2 inch) ~ DN 1500mm (60 inch)
- WORKING PRESSURE : Up to 50 bar
- WORKING TEMPERATURE : -55°C ~ +250°C (Soft seat)

APPLICABLE FLANGE

- KS/JIS 5K, 10K, 16K, 20K, 30K
- ASME B 16.5 Class 150LB, 300LB
- EN 1092 PN6, PN10, PN16, PN25
- ISO 7005 PN6, PN10, PN16, PN20, PN25



The High-performance Design

The axis of disc rotation is double eccentric offset to the seat ring.
When the disc rotates, it unseats a small turning angle by the cam effect.
This prevents seat abrasion and provides perfect seal for a long period.

Application

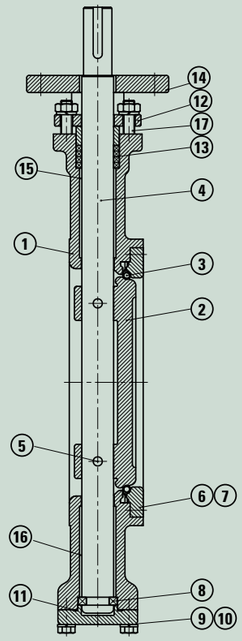
This product is of heavy load designed for high pressure flow application.

- Marine tankers-shipbuilding
- Offshore / Onshore plants, oil/gas production platform
- Chemical and petro-chemical plants
- Military application
- Fire safe piping system
- LPG

Operations

The valve shall be operated with the following actuators which selected depending on location of valve, the type of work and service for which the valve is used.

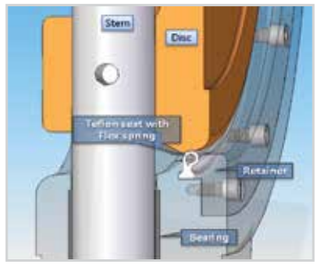
·Manual lever operation
·Manual worm gear operation
·Single or double acting pneumatic actuator operation
·Hydraulic actuator operation
·Electric motor actuator operation



Part List

NO	PART NAME	MATERIAL
1	BODY	CAST IRON / DUCTILE IRON / CAST STEEL STAINLESS STEEL / AL-BRONZE
2	DISC	CAST STEEL / STAINLESS STEEL / AL-BRONZE
3	SEAT	STAINLESS STEE / TEFLON / RUBBER
4	STEM	STAINLESS STEE (304, 316, 316L, 630, 17-4PH, Monel)
5	DISC PIN	STAINLESS STEEL
6	RETAINER	STAINLESS STEEL / AL-BRONZE / MILD STEEL
7	RETAINER BOLT	STAINLESS STEEL
8	THRUST PLATE	BRONZE / STAINLESS STEEL
9	BOTTOM COVER	STAINLESS STEEL / AL-BRONZE / MILD STEEL
10	BOTTOM BOLT	STAINLESS STEEL / MILD STEEL
11	BOTTOM GASKET	TEFLON / GRAPHITE / RUBBER
12	PACKING GLAND	STAINLESS STEEL / AL-BRONZE / MILD STEEL
13	PACKING	TEFLON / GRAPHITE / RUBBER
14	ACTUATOR STAND	MILD STEEL
15	STEM BEARING	TEFLON / STAINLESS / BRONZE
16	STEM BEARING	TEFLON / STAINLESS / BRONZE
17	BOLT & NUT	STAINLESS STEEL / MILD STEEL

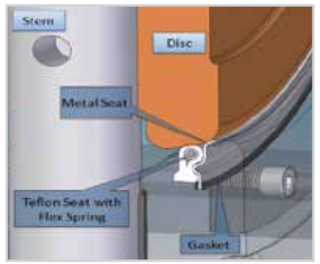
Design Features



SEAT RETAINER RING

Flexible teflon seat compensated by flexible spring withstand longer and can minimize the possibility of scratches by foreign article in the fluid than that of pure hard teflon.

The retainer together with spring assisted self energized seat ring shall work independently from the adjacent pipe in case of the retainer separated from the flange face of the valve as required by authority and the operating torque can be kept constant without variation by pressure from adjacent pipe flange.



FIRE SAFETY DESIGN

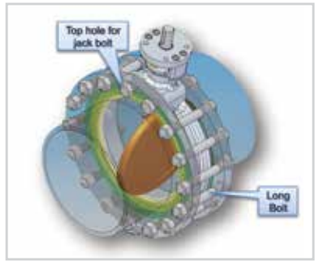
In fire safe models, the energized metal seal is extended so as to form secondary sealing device in the event of soft seal destruction.

The valve shall be capable of bi-directional flow bubble tight shut-off at full rated pressure.

TOP FLANGE (ISO 5211) For Actuator

The top flange of butterfly valve is one of most important parts for mounting of actuators.

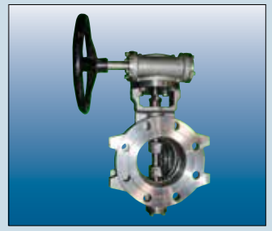
ACE VALVE provides top flange in accordance with International Standard, ISO 5211 and easy modification works can be available for various type actuator without any special tool or equipment which the remote actuator provided by actuator makers.



SEMI LUG TYPE

Ace valve provides semi lug type or flange type connection end of valve in accordance with JIS F 7480 in addition to wafer type valve. Semi-lug type connection shall allow the removal of the piping downstream of the valve under the condition of keeping the closed valve with tap holes and jack bolts to avoid spilling of liquid in the upstream pipe, while wafer type valve should be released from the pipe which requires additional works such as pumping and cleaning of the spillage at bottom in addition to manpower for removing and re-installing of the valve.

Specification of
Double Eccentric Disc Seated Butterfly Valves



With a wide range of production, up to 4,000mm in size, the eccentric butterfly valves are developed for applications in waterworks, power plants, desalination plants and other similar industrial plants, with compliance to AWWA C-504, BS 5155 JIS B2064. They are available in a variety of body and disc materials. Rubber linings, epoxy coating and cathodic protection are available for installation in corrosive atmospheric conditions.

The disc seat design facilitates easy replacement of the seat and maintains seat pressure of up to 40bar. Since the disc seated butterfly valves are capable of manual or remote operation, electric and pneumatic actuators can be provided according to client's requirements.
The valve shall be capable of bi-directional flow and provide bubble tight shut-off at full rated pressure.

TYPE NUMBERING SYSTEM

- AV-EWR Disc Seated Eccentric WAFER type Butterfly valves.
- AV-EFR Disc Seated Eccentric FLANGE type Butterfly valves.

STANDARDS COMPLIANCE

- The face to face dimension in accordance with API, AWWA, KS/JIS, BS, ISO or other STANDARDS are available upon request.

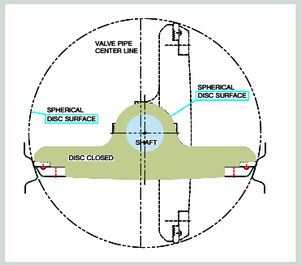
PRODUCTION RANGE

- SIZE : DN 80mm (3 inch) ~ DN 4000mm (160 inch)
- WORKING PRESSURE : Up to 40bar
- WORKING TEMPERATURE : -20°C ~ +200°C

APPLICABLE FLANGE

- KS/JIS 10K, 16K, 20K, 30K, 42K
- ASME B 16.1 Class 125LB, 250LB
- ASME B 16.5 Class 150LB, 300LB
- AWWA C 207 Class B, D, E
- EN 1092 PN6, PN10, PN16, PN25, PN40
- ISO 7005 PN6, PN10, PN16, PN20, PN25, PN40

Double Eccentric Disc Seated Butterfly Valves



The Double Eccentric Design

Applicable for butterfly valve with interchangeable soft seat.

- Circular unbroken seats on disc and in body.
- Simple maintenance.
- Change of seat ring by dismantling of the retaining ring only.
- Wide variety of seat materials available.

Suitable for installation in Medium Range Pressure System (<40㎏/㎠)
No limitation on corrosiveness of medium with proper seat material.

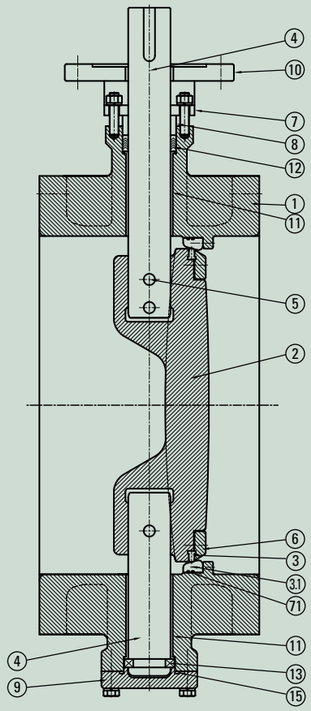
Operations

The following operating actuator of the valve is available, depend on location and the condition of work and service for which the valve is installed.

- Manual lever operation
- Manual worm gear operation
- Single or double acting pneumatic actuator operation
- Hydraulic actuator operation
- Electric motor actuator operation

Part List

No	PART NAME	METERIAL
1	BODY	DUCTILE IRON / CAST STEEL STAINLESS STEEL / NI-AL BRONZE
2	DISC	DUCTILE IRON / CAST STEEL STAINLESS STEEL / NI-AL BRONZE
3	SEAT	NBR, EPDM / VITON
3.1	BODY SEAT	STAINLESS STEEL / NI-AL BRONZE
4	STEM	STAINLESS STEEL / MONEL
5	DISC PIN	STAINLESS STEEL / MONEL
6	RETAINER	STAINLESS STEEL / NI-AL BRONZE
7	PACKING GLAND	DUCTILE IRON / CAST STEEL STAINLESS STEEL / NI-AL BRONZE
8	GLAND RING	BRONZE / STAINLESS STEEL
9	BOTTOM COVER	DUCTILE IRON / CAST STEEL STAINLESS STEEL / NI-AL BRONZE
10	STAND	CARBON STEEL / CAST STEEL DUCTILE IRON / STAINLESS STEEL
11	STEM BEARING	STAINLESS STEEL / BRONZE / OILLESS BEARING
12	V-PACKING	NBR / EPDM / VITON
13	THRUST PLATE	BRONZE / STAINLESS STEEL
15	BOTTOM O-RING	NBR / EPDM / VITON
71	BODY SEAT O-RING	NBR / EPDM / VITON



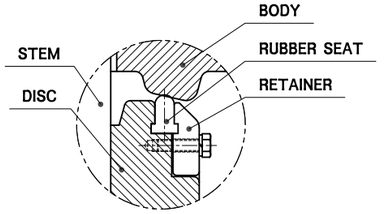
Applications

- Desalination
- Power plant
- Others
- Salt water service
- Sea water

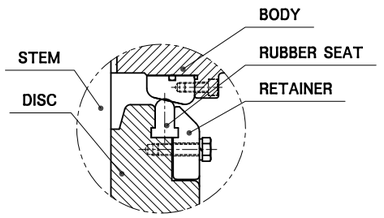
Hydro Test Specifications

Series	ISO Series	AWWA Series
"Hydrostatic Shell test"	1.5 x maximum service pressure	2.0 x maximum service pressure
"Hydrostatic Seat test"	1.1 x working service pressure	working service pressure

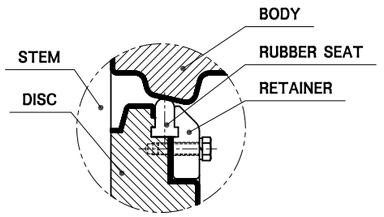
Design Features



- It is designed rubber seat to be inserted in the disc.
- More suitable rubber seat can be adopted in accordance with characteristics of fluid.
- Rubber seat can be exchanged without dismantling of pipeline.



- It is designed rubber seat to be inserted in the disc.
- More suitable rubber seat can be adopted in accordance with characteristics of fluid.
- Rubber seat can be exchanged without dismantling of pipeline
- An additional ring is inserted in the body to replace seat ring on the contacting area between body seat and disc seat.
- The respective maintenance work is possible for seat and disc seat.



- It is designed rubber seat to be inserted in the disc.
- More suitable rubber seat can be adopted in accordance with characteristics of fluid.
- Rubber seat can be exchanged without dismantling of pipeline
- Corrosion prevention is available with special coating on the body and disc.

Specification of

Double Eccentric Cargo Oil Butterfly Valves




Ace Valve's rubber seated double eccentric butterfly valve feature is a heavy loaded design for high-pressure and high flow-rate applications. They have been widely adapted for oil and gas valves in oil tankers, FPSO onshore / offshore field and high flow-rate piping systems. The delicate design of the seat ring keeps the retainer free from any pressure from flanges on adjacent pipes, misaligned flanges or flexibility in the pipes.
Moreover, it minimize the foreign articles remained on the seat in order to reduce damage of seat ring.
The valve shall be capable of bi-directional flow and provide bubble tight shut-off at full rated pressure.

TYPE NUMBERING SYSTEM

- AV-OSR Double Eccentric SEMI-LUG type Butterfly valves
- AV-OLR Double Eccentric LUG type Butterfly valves
- AV-OFR Double Eccentric FLANGE type Butterfly valves

STANDARD COMPLIANCE

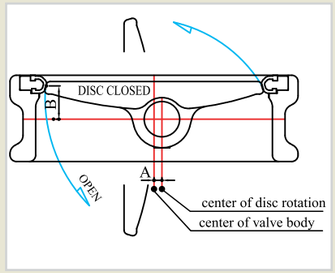
- The face to face dimension shall be in accordance with KSV 7490, JIS F 7480

PRODUCTION RANGE

- SIZE : DN50mm (2 inch) ~ DN1000mm (40 inch)
- WORKING PRESSURE : Up to 40bar
- WORKING TEMPERATURE : -20℃ ~ +250℃

APPLICABLE FLANGE

- KS/JIS 5K, 10K, 16K, 20K, 30K
- ASME B 16.5 Class 150LB, 300LB
- EN 1092 PN6, PN10, PN16, PN25
- ISO 7005 PN6, PN10, PN16, PN20, PN25



The Double Eccentric Design

It effects friction-free contact between disc and seat since the rotation axis(stem) of the valve disc is shifted from the center by a distance of the width of A and B, a cam effect is produced which prevents from wearing the seal surface, lessening or reducing seating torque and offers long service life and easy operation.

Application

It is provided of heavy load designed for high pressure and high-flow rate application.

- Crude oil and product oil piping system
- Tank cleaning system
- Cargo tank Venting and Inert gas system
- Sea water system
- Fuel oil and Diesel oil system
- Other piping system where applicable

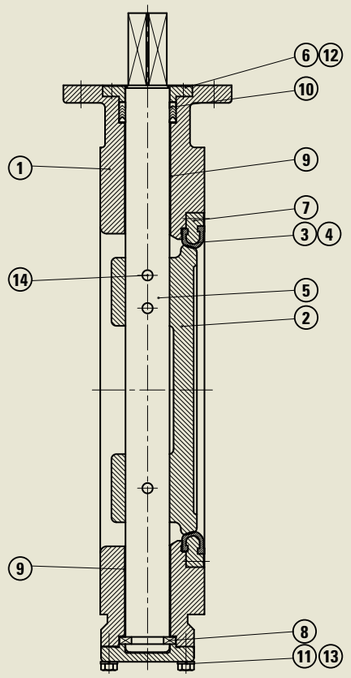
Operations

The valve shall be operated with the following actuators which selected depending on location of valve, the type of work and service for which the valve is used.

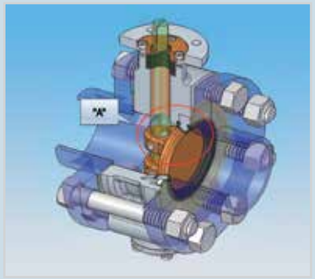
·Manual lever operation
·Manual worm gear operation
·Single or double acting pneumatic actuator operation
·Hydraulic actuator operation
·Electric motor actuator operation

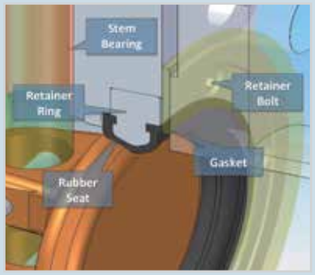
Part List

NO.	PART NAME	MATERIAL
1	BODY	CAST IRON / DUCTILE IRON STAINLESS STEEL / CARBON STEEL ALUMINUM BRONZE
2	DISC	STAINLESS STEEL / CAST STEEL ALUMINUM BRONZE / ALLOY STEEL
3	RETAINER	CAST IRON / DUCTILE IRON STAINLESS STEEL / CARBON STEEL ALUMINUM BRONZE
4	SEAT	NBR / VITON
5	STEM	STAINLESS STEEL (SS304, 316, 410)
6	GLAND BUSH	STAINLESS STEEL / BRONZE
7	RETAINER BOLT	STAINLESS STEEL / GALV. STEEL
8	THRUST PLATE	STAINLESS STEEL / BRONZE
9	STEM BARING	STAINLESS STEEL + PTFE
10	PACKING	NBR / VITON
11	BOOTOM COVER	CAST IRON / DUCTILE IRON STAINLESS STEEL / CARBON STEEL ALUMINUM BRONZE
12	GLAND BOLT	STAINLESS STEEL / GALV. STEEL
13	BOOTOM BOLT	STAINLESS STEEL / GALV. STEEL
14	DISC PIN	STAINLESS STEEL / GALV. STEEL



Design Features





Detail "A"

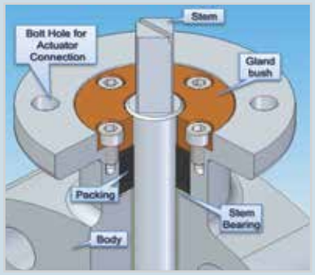
SEAT RETAINER RING (Flange faced retainer)

The seat is designed having round shape to avoid foreign articles in the oil to be remained on the seat.

The rubber seat to be adhered on the metal retainer by heat treatment to minimize the damage of rubber by high liquid shock.

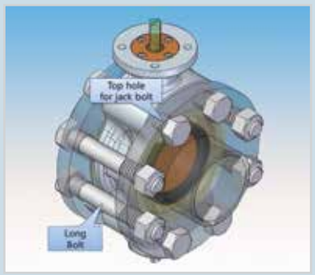
The retainer together with seat ring shall work independently from the adjacent pipe as the retainer is separated from the flange face of the valve and operating torque of the valve shall be kept constant as the pipe flange shall not pressurize the retainer and seat ring.

The global standard such as ASME requires retainer separated from valve flange. The seat provides bubble tight at bi-direction full rated pressure.



SHAFT SEALING (Gland bush with V-Packing)

V-packing with gland bush keeps the sealing in way of valve stem perfectly without additional tightening device after operating of the valve while other packing requires additional tightening work with the packing adjustment screw.



SEMI LUG TYPE

Ace valve provides semi lug type or flange type end of valve in accordance with JIS F 7480 in addition to wafer type valve. Semi-lug type connection shall allow the removal of the piping downstream of the valve under the condition of keeping the closed valve with tap holes and jack bolts to avoid spilling of liquid in the upstream pipe, while wafer type valve should be released from the pipe which requires additional works such as pumping and cleaning of the spillage at ship's bottom in addition to manpower for removing and re-installing of the valve.

Specification of

Concentric Butterfly Valves

The Concentric Butterfly Valve Feature is a symmetrical disc design, ensuring favorable flow-characteristics, and low pressure-drop. The concentric shaft ensures low operating torque. Concentric butterfly valve can be manufactured with the sizes up to 4,000mm, with replaceable rubber seat, with various kind of materials. The valve shall be capable of bi-directional flow with bubble tight shut-off at full rating pressure. The unique seat design with retaining points, virtually eliminates any seat movement during open / close operation of the disc. A PTFE / PFE lined body is also available for chemically high-corrosive fluid conditions.

TYPE NUMBERING SYSTEM

- AV-CWR Concentric WAFER type Rubber lined Butterfly Valves
- AV-CSR Concentric SEMI-LUG type Rubber lined Butterfly Valves
- AV-CLR Concentric LUG type Rubber lined Butterfly Valves
- AV-CFR Concentric FLANGE type Rubber lined Butterfly Valves

STANDARD COMPLIANCE

- ACE Concentric Butterfly valves conform to ISO 5752, KSV 7490, JIS F 7480, JIS B 2032, API 609, BS 5155, DIN2501.

PRODUCTION RANGE

- SIZE : DN 50mm (2 inch) ~ DN 4000mm (160 inch)
- RATING PRESSURE : Up to 20 bar depend on related size
- RATING TEMPERATURE : -40°C ~ +230°C

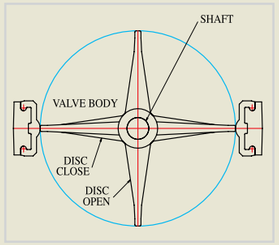
APPLICABLE FLANGE

- KS/JIS 5K, 10K, 16K
- ASME B 16.5 Class 150LB
- ISO 7005 PN6, PN10, PN16
- DIN 2501 PN6, PN10, PN16
- ASME B 16.1 Class 125LB
- EN 1092 PN6, PN10, PN16
- GB 2501/2506 PN6, PN10, PN16
- BS4504 PN6, PN10, PN16

The Concentric Design

CENTER OF SHAFT / 'Seat in the 'Center of Valve Body'
Applicable for BUTTERFLY VALVE WITH ELASTOMER LINING.

Schema of Concentric type



The valve shall be a 90° turn clockwise to close, non-jamming, and resilient seated valve for zero leakage service.
The valve shall be torque seated and designed in such a manner that the disc can not be rotated freely at the closed position.
Also this valve enables the fluid perfect shut-off regardless of the flow direction.
·Symmetric disc design ensures favourable flow characteristics and low pressure drop
·Concentric shaft ensures low operating torque
·Lining gives a good protection to valve body and acts as flange gasket
- Shaft penetrates the valve seat
- Limited choice of seating materials(Elastomer only)

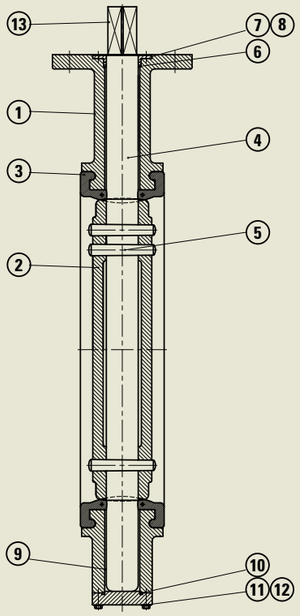
Operations

The following operation of the valve is possible depending on the valve location, the type of work and service of the valve to be provided.

- Manual lever operation
- Manual worm gear operation
- Single or double acting pneumatic actuator operation
- Hydraulic actuator operation
- Electric motor actuator operation

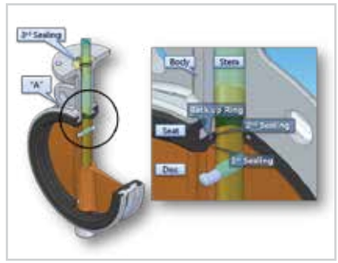
Part List

NO.	PART NAME	MATERIAL
1	BODY	CAST IRON / DUCTILE IRON STAINLESS STEEL / CARBON STEEL (NICKEL) ALUMINUM BRONZE
2	DISC	STAINLESS STEEL / ALLOY STEEL (NICKEL) ALUMINUM BRONZE
3	SEAT	NBR / VITON / SILICON / EPDM
4	STEM	STAINLESS STEEL(SS304, 316, 410, 420, 17-4PH) / MONEL / DUPLEX
5	DISC PIN	STAINLESS STEEL OR MONEL
6	O-RING	RUBBER SAME AS SEAT MATERIAL
7	PACKING GLAND	BRONZE / STAINLESS STEEL / STEEL(HOT DIP GALV.)
8	GLAND BOLT	STAINLESS STEEL
9	BEARING	PTFE + PB
10	O-RING	RUBBER SAME AS SEAT MATERIAL
11	BOTTOM COVER	CARBON STEEL / STAINLESS STEEL AL-BRONZE / MILD STEEL
12	BOLT & WASHER	STEEL / STAINLESS STEEL
13	KEY or SQUARE	MILD STEEL / IF NECESSARY



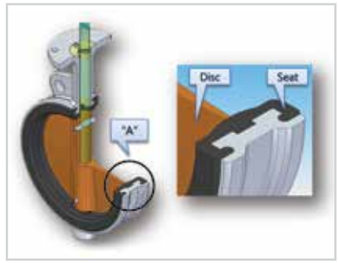
Concentric Butterfly valves

Design Features



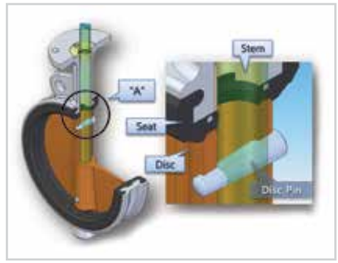
DISC SEAT DESIGN (Triple sealing system)

Ace valve has triple sealing system on the connection part of stem and seat which is improved construction compare to that having only simple structure occurring frequent leakage problem when the body slightly deviates from central axis.
The first seal : It shows perfect sealing effect with the minimum friction by the connection with the slope and the globular shape.
The second seal : Even if the shaft is declined by the fluid pressure to keep the position by the seal structure around shaft will be remained without collapse for perfect sealing. The third seal : Ace valve has o-ring and gland bush(top cover) independently from operating unit.



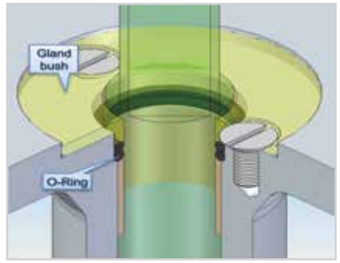
DISC SEAT (Completely spherical shape)

The grooves are provided in way of mid and each end part of body around to fix the seat in the body to avoid movement or detachment of rubber seat by unexpected forces.
Ball shape rubber to be provided to contact with flat shape disc which gives central position of disc because shorter distance at center line compare to longer diagonal length at disc end.



DISC PIN DESIGN

Taper pin to be provided to fix disc in to the shaft, instead of thread bolt to avoid unexpected releasing of the thread caused by the environmental vibration.



SHAFT SEALING (Gland bush with O-ring)

An O-ring with gland bush is provided for the shaft hole in the body as a third sealing device but low torque.
The O-ring can be kept by gland bush (top cover) in any case.
Oilless bearing is provided to minimize operating torque.

Specification of
Concentric Pinless Butterfly Valves

STANDARD COMPLIANCE

International Standard API609, JIS F7480, KSV7490, ISO5752, JIS B2032, BS5155, DIN2501.

TYPE NUMBERING SYSTEM

- AV-CWN Concentric Wafer type butterfly valve with pinless design
- AV-CSN Concentric Semi-lug type butterfly valve with pinless design
- AV-CLN Concentric Full Lug type butterfly valve with pinless design
- AV-CFN Concentric Flange type butterfly valve with pinless design

APPLICABLE FLANGE STANDARD

- KS/JIS 5K, 10K, 16K
- ASME B16.1 Class 125LB
- ASME B16.5 Class 150LB
- ISO 7005 PN6, PN10, PN16
- EN 1092 PN6, PN10, PN16
- GB 2501/2506 PN6, PN10, PN16
- DIN 2501 PN6, PN10, PN16

PRODUCTION RANGE

- Size : Wafer DN50 ~ DN400
  Semi Lug DN50 ~ DN800
  Lug DN50 ~ DN800
  Flange DN50 ~ DN1200 (other Dimensions on request)
- Rating Pressure : Up to 16Barg
- Rating Temperature : -25°C ~ 200°C

APPLICABLE MATERIAL

- Body : Cast Iron/ Ductile Iron / Cast Steel / Stainless Steel / Al-Bronze
- Disc : Stainless Steel / Al-Bronze
- Seat : Rubber - NBR, EPDM, VITON
- Stem : Stainless Steel

Complete dry shaft sealing design.

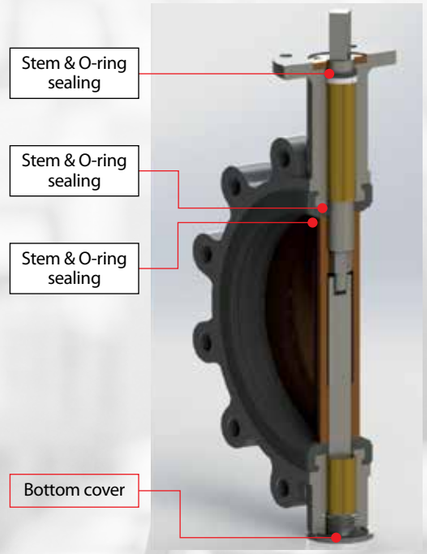
- Multi seal design keeps the sealing in way of valve stem perfectly without additional tightening device after operating of the valve.

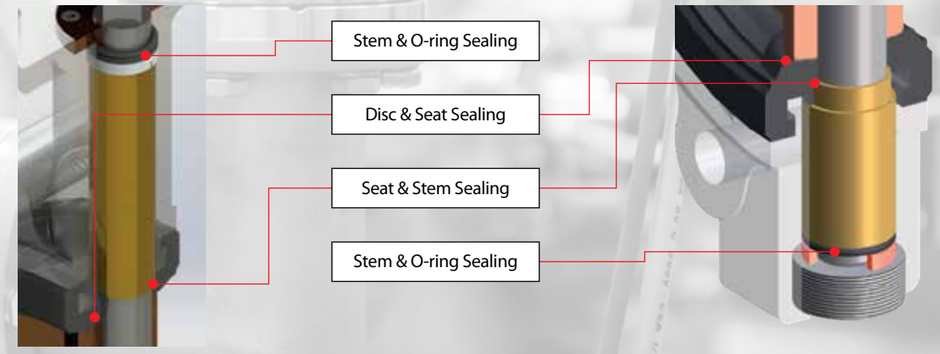
- The sealing design on the connection part of stem, disc and seat which is improved construction

First sealing. Disc(top&down side) & seat sealing shows perfect sealing effect with connection with the sphere shape.

Second sealing. Even if the disc part leaked by the fluid pressure to keep the position by the seat & stem sealing part will be

Third sealing. Ace valve has o-ring and gland bush independently from the operating unit.

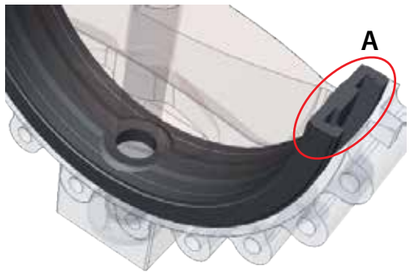




- O-ring part exists in the valve independently of the seat to prevent leakage. (Stem & O-ring sealing)

Design Feature

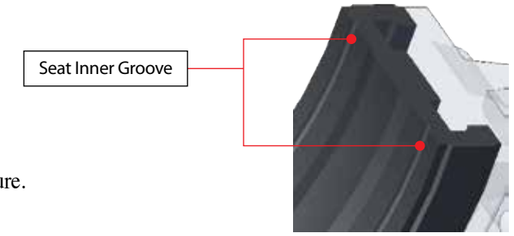
Seat Design



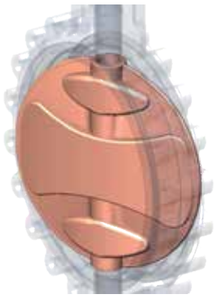
- ACE Valve's Concentric butterfly valve have a super structure in the seat.
- The central part of the seat top&down is same spherical shape as disc so that the seat can contact the disc smoothly.
- The disc in contact with the spherical seat operates at low torque.

- The seat inner groove prevents deformation of the seat by piping tightening pressure. Also, it's possible to reduce the torque increased on the valve seat when the piping tightening pressure.

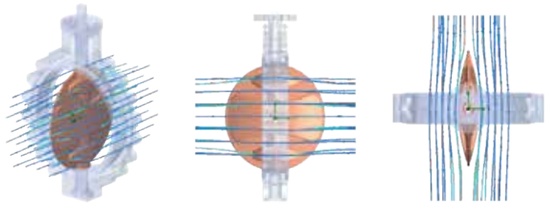
Detail "A"

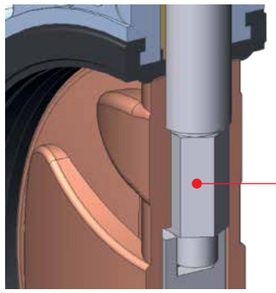


Disc Design



- Disc is designed as special structure which maintains a sufficient intensity under high-pressure and high velocity.
- The disc is produced by full spherical machining.
- Every part of the sealing surface is spherical as the seat surface.
- These fit together with a smooth touch and torque are reduced.
- Specially, the disc design of above DN400 is shaped to suit fluid flow as shown in the figure and prevents turbulence.





Pinless type Stem Design(Hexagon type stem)

- Pinless type stem(Hexagon type stem) to be provided to fix disc into the stem, instead of thread bolt & taper type pin to avoid unexpected releasing thread of the caused by the environmental vibration and disc pin corrosion.
- It is easy to disassemble and assemble after installation, and is fully compatible without additional processing when supplying spare parts.

Specification of Ball Valves

TYPE NUMBERING SYSTEM

- AV-BFA Floating Flange Type Full Bore Ball valves
- AV-BFB Floating Flange Type Reduce Bore Ball valves
- AV-BTA Trunnion Mounted Side Entry Flange Type Full Bore Ball valves
- AV-BTB Trunnion Mounted Side Entry Flange Type Reduce Bore Ball valves
- AV-BTC Trunnion Mounted Side Entry Butt Welding Type Full Bore Ball valves
- AV-BTD Trunnion Mounted Side Entry Butt Welding Type Reduce Bore Ball valves
- AV-BOA Trunnion Mounted Top Entry Flange Type Full Bore Ball valves
- AV-BOB Trunnion Mounted Top Entry Flange Type Reduce Bore Ball valves
- AV-BOC Trunnion Mounted Top Entry Butt Welding Type Full Bore Ball valves
- AV-BOD Trunnion Mounted Top Entry Butt Welding Type Reduce Bore Ball valves

STANDARDS COMPLIANCE

- The face to face dimension shall be in accordance with ASME B 16.10, API 6D, API 6D SS, API 6A.
- Fire safe design shall be in accordance with API 607.

PRODUCTION RANGE

- SIZE : DN 15mm (1/2 inch) ~ DN 1500mm (60 inch)
- FLANGE RATING : ASME 150LB, 300LB, 600LB, 900LB, 1500LB, 2500LB API 2000, 3000, 5000, 10000, 15000, 20000
- WORKING PRESSURE : 20000psi (1406kg/cm^2)
- WORKING TEMPERATURE : -196°C ~ +815°C

APPLICABLE FLANGE

- KS/JIS 5K, 10K, 16K, 20K, 30K, 40K, 63K
- ASME B 16.5 Class 150LB, 300LB, 600LB, 900LB, 1500LB, 2500LB
- ASME B 16.47 Class 150LB, 300LB, 600LB, 900LB
- API 2000, 3000, 5000, 10000, 15000, 20000
- EN 1092 PN6, PN10, PN16, PN25, PN40
- ISO 7005 PN6, PN10, PN16, PN20, PN25, PN40

Design

Floating

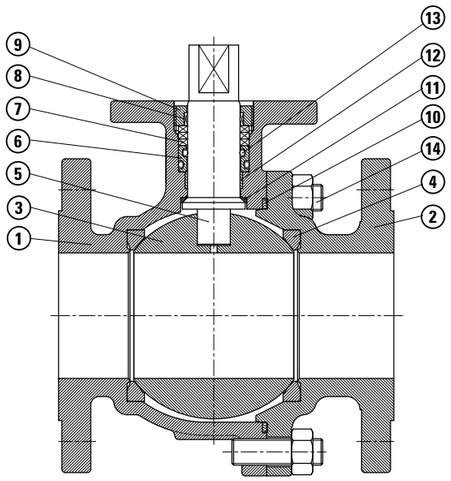
- Pressure assisted seats give tight shut-off in all valves at low line pressure or small size valve, the floating ball is in contact with the seat.

Trunnion

- Trunnion ball is applicable to high pressure or large size valves which reduced sealing load against the fluid pressure, with lower operational torque and long durability.

Characteristics

- Bi-directional valve.
- Blowout-Prevent stem.
- Stem and trunnion are fitted in self lubricated bush which result low operating torques for easy operation.
- Live-loaded thrust washer prevents galling and provides a secondary stem seal.
- Stem extension is available upon requirement of clients to comply with installation condition.
- Applicable standard : ASME B16.5, 16.10 and B16.34, API 6D, API 608, API 607.
- Anti-Static Device.
- ASME Section 8 cover/body flange connection and bolting provide high sealing integrity of body gasket.



Part List

NO.	PART NAME	MATERIAL
1	BODY	CAST STEEL / STAINLESS STEEL / AL BRONZE
2	CAP	
3	BALL	STAINLESS STEEL / BRONZE+Cr COATING / METAL+HARD FACING
4	SEAT	PTFE / RTFE / DEVLON / NYLON / PEEK / METAL+HARD FACING
5	STEM	STAINLESS STEEL
6	STEM SEAL RETAINER	CARBON STEEL / STAINLESS STEEL
7	PACKING	GRAPHITE / PTFE / VOC / RUBBER
8	GLAND BUSH	PTFE / CARBON STEEL+PTFE / STAINLESS STEEL+PTFE
9	GLAND RING	CARBON STEEL / STAINLESS STEEL
10	CAP GASKET	SPIRAL WOUND / GRAPHITE / PTFE / RUBBER
11	THRUST WASHER	PTFE / CARBON STEEL+PTFE / STAINLESS STEEL+PTFE
12	STEM BUSH	PTFE / CARBON STEEL+PTFE / STAINLESS STEEL+PTFE
13	STEM O-RING	RUBBER
14	CAP BOLT	CARBON STEEL / STAINLESS STEEL

* Other material can be available upon requirement.

Specification of
Cryogenic Butterfly Valves for LNG

AV-LNG Series
(Flanged)

AV-LNG Series
(Butt-welding)

Ace cryogenic butterfly valves are widely used throughout the world, from liquefaction plants to liquefied gas carriers and receiving tank terminals, in critical and hazardous conditions and temperatures as low as -196°C.

THE CRYOGENIC LNG BUTTERFLY VALVE DESIGN

- Bi-directional design.
- With butt-welding ends or flanged ends.
- With inspection/ maintenance access (Side entry).
- Triple offset design.
- Valve may be fitted in any orientation.
- Extended bonnet / Shaft for safe access.

STANDARD COMPLIANCE

- BS 6364 Valves for Cryogenic service.
- Fire Safe approved in accordance with API 607.

PRODUCTION RANGE

- SIZE : DN 100mm (4 inch) ~ DN 2000mm (80 inch)
- FLANGE RATING : ASME B 16.5 Class 150LB, 300LB
- WORKING PRESSURE : Up to 50bar
- WORKING TEMPERATURE : -196°C ~ +815°C

APPLICATION

- Gas carrier (Liquefied Natural Gas, Acetylene, Ethylene)
- Receiving terminal
- Liquefied oxygen(-160°C) plant

Schema of Cryogenic (LNG) Butterfly valve

ACE cryogenic valves are widely used throughout the world, from liquefaction plants, to liquefied gas carries, receiving tank terminals as well as peak shaving plants, in a critical and hazardous service conditions down to the temperature as low as -196°.
The materials used throughout are of austenite stainless steel which maintains its strength at low temperature and the sealing system is metal seated provide bi-directional bubble tight shut-off which achieved by introducing state of the triple eccentric geometry.
The metal seated removable Triple eccentric design is available.
The valves are of extended bonnet design to create an insulation gas column between the stem packing and the cold fluid.
This prevents hardening and shrinking the packing and allows the external operating section of the valve remained “worm” condition.
The valve of butt-welding end has side entry maintenance system to make the replacement of sealing ring without removing the valves from the pipes.
All valves are tested at cryogenic temperature with “Manifold System” which can examine the performance as critical as in an actual service condition.

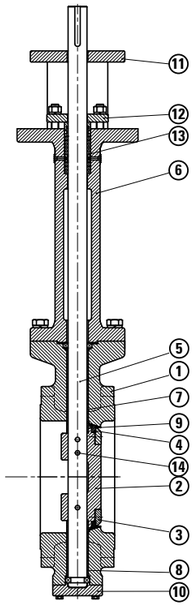
Operations

The following operation of the valve is available, the choice depends on the valve location and the type of work and service for which the valve is used.

- Manual worm gear operation
- Single or double acting pneumatic actuator operation
- Hydraulic actuator operation
- Electric motor actuator operation

Part List

No	PART NAME	METERIAL
1	BODY	STAINLESS STEEL
2	DISC	STAINLESS STEEL
3	RETAINER	STAINLESS STEEL
4	SEAT	STAINLESS STEEL
5	STEM	STAINLESS STEEL
6	YOKE	STAINLESS STEEL
7	BEARING	STAINLESS STEEL
8	BEARING	STAINLESS STEEL
9	GASKET	SPIRAL WOUND
10	BOTTOM COVER	STAINLESS STEEL
11	STAND	STAINLESS STEEL
12	PACKING GLAND	STAINLESS STEEL
13	PACKING	PTFE/RTFE/GRAPHITE
14	DISC PIN	STAINLESS STEEL



Cryogenic Butterfly valves for LNG

Materials Specification for ACE Cryogenic Valves

All materials supplied for the valve components are suitable for operation in LNG installations.
Impact test is carried out on pressure retaining parts (body, bonnet, disc, studs and nuts) of cast material, according to ASTM Testing Procedures with Charpy V Specimen at-196°C.

Following minimum test results are required:
- average (on 3 specimen) not less than 3.5 kgm/㎠
- minimum (on 1 specimen) not less than 3 kgm/㎠

Features & Benefits

- Bi-directional bubble tight shut-off performance
- Developed Geometry results in
  - Zero seal friction
  - Low torques
  - Extended service life
- All cryogenic valves to be tested in fully equipped cryogenic testing facilities at ACE factory.
- End connection type : Double flanged, Butt-weld side entry
- One piece stem for maximum strength and safety over extended periods of time
- Gland Packing can be adjusted without actuator removal
- Inherently fire-safe by design due to metal seat
- Extended bonnet according to BS6364
- Anti-blow out stem design

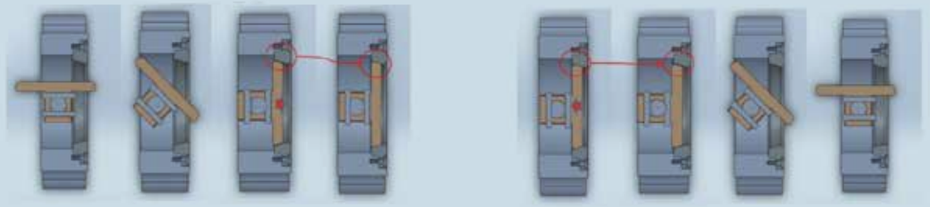
Double Eccentric Metal seated Cryogenic Butterfly Valves

- Unique and Innovative Functional Design
- World's First and New Development
- Linear Lifting Stem/Disc Design inducing Zero Friction of Disc & Seat surfaces
- Solid Metal to Metal Seat with hard facing as a basic trim design, Metal to **Soft Seat as an option**
- Super Fine Seat Face roughness by state-of-the-art machining
- Origin in South Korea exclusive
- Cutting Edge Seal Technology across the entire seat face
- Replaceable Metal Seat with Retainer

DESIGN CONCEPT

Double Eccentric Metal Seated Cryogenic Butterfly Valve with Linear Lifting Stem & Disc is **Unique and the First** in the world.
Unique design allows disc to move linearly perpendicular to body seat against flow direction.
It provides **ZERO friction on overall surface of seats** when both open & close of the disc during operation which leads to **less torque** than ever.
Also, **Perfect seat sealing** with no seat leakage is well achieved by **flexible adjusting way to push the disc** against body seat when close the disc.

Graphic view to exhibit innovative Linear Lifting Stem/Disc



Cryogenic Gate, Globe, Ball & Check Valves for LNG

AV-L Series Cryogenic Gate Valve

AV-L Series Cryogenic Globe Valve

AV-L Series Cryogenic Ball Valve

AV-L Series Cryogenic Swing Check Valve

PRODUCTION RANGE

- SIZE : Cryogenic Gate valve : DN 50mm (2 inch) ~ DN 1200mm (48 inch)
  Cryogenic Globe valve : DN 50mm (2 inch) ~ DN 600mm (24 inch)
  Cryogenic Ball valve : DN 50mm (2 inch) ~ DN 1500mm (60 inch)
  Cryogenic Swing Check valve : DN 50mm (2 inch) ~ DN 600mm (24 inch)
- FLANGE RATING : ASME B 16.5 Class 150LB, 300LB
- WORKING PRESSURE : Up to 50bar
- WORKING TEMPERATURE : -196°C ~ +815°C

Specification of
Cryogenic Butterfly Valves for LPG

Ace cryogenic LPG butterfly valves are widely used throughout the world, from liquefaction plants to liquefied gas carriers and receiving tank terminals, in critical and hazardous conditions and temperatures as low as -55°C.

THE CRYOGENIC LPG BUTTERFLY VALVE DESIGN

- Bi-directional design.
- End connection : Flanged, Wafer and lug.
- Double offset shaft.
- Valve may be fitted in any orientation.
- Extended bonnet / Shaft for safe access.

STANDARD COMPLIANCE

- API 609 Valves for Cryogenic service.
- Fire Safe approved in accordance with API 607.

PRODUCTION RANGE

- SIZE : DN 25mm (1 inch) ~ DN 1200mm (48 inch)
- FLANGE RAITNG : ASME B 16.5 150LB, 300LB
- WORKING PRESSURE : Up to 50bar
- WORKING TEMPERATURE : -46°C ~ +250°C

APPLICABLE FLANGE

- KS/JIS 5K, 10K, 16K, 20K, 30K
- ASME B 16.5 Class 150LB, 300LB
- EN 1092 PN6, PN10, PN16, PN25
- ISO 7005 PN6, PN10, PN16, PN20, PN25

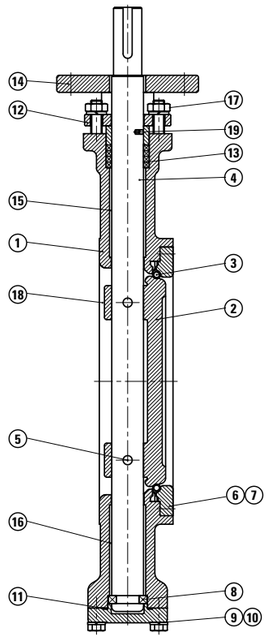
Application

- Gas carrier (Liquefied Propane Gas etc.)
- Receiving terminal

Operations

The following operation of the valve is available, the choice depends on the valve location and the type of work and service for which the valve is used.

- Manual lever operation
- Manual worm gear operation
- Single or double acting pneumatic actuator operation
- Hydraulic actuator operation
- Electric motor actuator operation



Part List

NO	PART NAME	MATERIAL
1	BODY	LOW TEMP.CAST STEEL / STAINLESS STEEL
2	DISC	LOW TEMP.CAST STEEL / STAINLESS STEEL
3	SEAT	STAINLESS STEEL + PTFE / RTFE
4	STEM	STAINLESS STEEL / DUPLEX / ALLOY STEEL
5	DISC PIN	STAINLESS STEEL / DUPLEX / ALLOY STEEL
6	RETAINER	LOW TEMP.CARBON STEEL / STAINLESS STEEL
7	RETAINER BOLT	STAINLESS STEEL
8	THRUST PLATE	STAINLESS STEEL
9	BOTTOM COVER	LOW TEMP. CARBON STEEL / STAINLESS STEEL
10	BOTTOM BOLT	STAINLESS STEEL
11	BOTTOM GASKET	PTFE / GRAPHITE
12	PACKING GLAND	STAINLESS STEEL / LOW TEMP. CARBON STEEL
13	PACKING	PTFE / GRAPHITE
14	ACTUATOR STAND	MILD STEEL / STAINLESS STEEL
15	UPPER STEM BEARING	STAINLESS STEEL + PTFE
16	LOWER STEM BEARING	STAINLESS STEEL + PTFE
17	BOLT & NUT	STAINLESS STEEL
18	SET BOLT	STAINLESS STEEL
19	ANTI-STATIC DEVICE	STAINLESS STEEL

Specification of
Gate & Globe Valves

Bolted Bonnet metal seated gate & globe valves are widely used on piping system and for industrial plants.

TYPE NUMBERING SYSTEM

- AV-S Bolted Bonnet Gate Valves.
- AV-G Bolted Bonnet Outside Screw & Yoke Globe Valves.

STANDARD COMPLIANCE

- The face to face dimension shall be in accordance with ASME B 16.10.
- The body is designed to API 600, ASME B 16.34, BS 1873.

PRODUCTION RANGE

- SIZE : DN 50mm (2 inch) ~ DN 1500mm (60 inch)
- WORKING PRESSURE : Up to 430 bar
- WORKING TEMPERATURE : -196°C ~ +815°C

APPLICABLE FLANGE

- ASME Class 150LB ~ 2500LB
- EN 1092 PN6 ~ PN63
- ISO 7005 PN6 ~ PN40

Features

It is the valve which shut off at a right angle with flow direction of fluid by vertical movement of wedge.

1. Gate valve is suitable for simple opening / closing.
2. It is recommended to avoid control of flow due to resist of fluid in the back of wedge and cavitations which may cause corrosion on wedge.
3. It has double locking effectiveness because the seat has both sides.
4. When wedge is fully opened, it minimizes fluid flow disturbance by deviating from inside diameter.

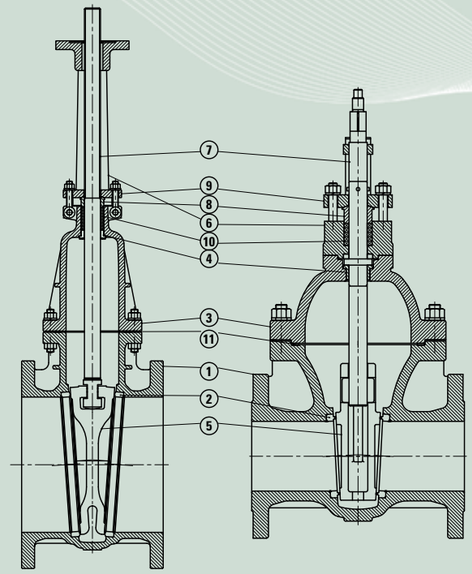
Operations

The following operation of the valve is available and the choice depends on the valve location, the type of work and service for each the valve is used.

- Manual hand wheel Operation
- Manual bevel gear Operation
- Hydraulic actuator Operation
- Electric actuator Operation
- Pneumatic actuator Operation

Part List

NO	PART NAME	MATERIAL
1	BODY	CAST STEEL / STAINLESS STEEL
2	BODY SEAT RING	STEEL WITH 13CR. FACED / STAINLESS STEEL
3	BONNET	CAST STEEL / STAINLESS STEEL
4	BUSH RING	STEEL With 13CR. FACED / STAINLESS STEEL
5	DISC	STEEL With 13CR. FACED / STAINLESS STEEL
6	YOKE	CAST STEEL / STAINLESS STEEL
7	STEM	STAINLESS STEEL
8	GLAND RING	STAINLESS STEEL
9	PACKING GLAND	CAST STEEL / STAINLESS STEEL
10	PACKING	NON-ASBESTOS
11	GASKET	NON-ASBESTOS



Bolted Bonnet
Outside Screw & Yoke
(Rising Stem)

Bolted Bonnet
Inside Screw & Yoke
(Non-Rising Stem)

Resilient Seated Gate Valves

Features

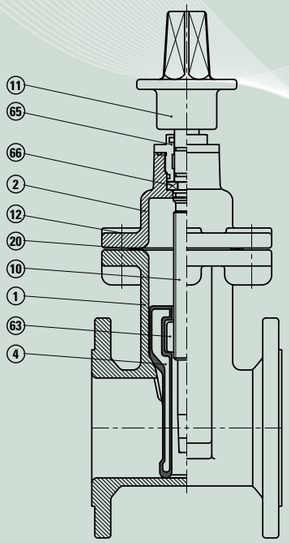
- Ductile iron body and bonnet for high strength and impact resistance.
- Ductile iron disc fully encapsulated in EPDM rubber to ensure tight shut-off sealing.
- Stainless steel shaft for high strength and corrosion resistance.
- Fusion Bonded Epoxy coating for long life corrosion protection.
- Straight through full bore to avoid debris traps.

Specification

- Design standard : BS 5163, AWWA C509, DIN 3202
- Design Temperature : Up to 120°C
- Size : DN 50mm (2inch) ~ DN 600mm (24 inch)
- Flange Rating : ASME Class 150LB
  EN/ISO PN10, PN16

Application

- Water works
- Water treatment plants
- Plumbing and Sanitary system
- Drainage system
- HVAC system
- Fire protection system
- Manual hand wheel Operation
- Manual spur or bevel gear Operation
- Electric actuator Operation



Operations

- Manual hand wheel Operation
- Manual spur or bevel gear Operation
- Electric actuator Operation

Part List

No	PART NAME	MATERIAL
1	BODY	DUCTILE IRON
2	BONNET	DUCTILE IRON
4	DISC	DUCTILE IRON + EPDM LINING
10	STEM	STAINLESS STEEL
11	CAP	DUCTILE IRON
12	BONNET BOLT	STAINLESS STEEL
20	GASKET	EPDM
63	SCREWED PIECE	BRASS
65	GUIDE BUSH	BRASS
66	GUIDE BUSH	BRASS

Globe Valves

Feature

The valve shut off flow direction of fluid by vertical movement of plug type disc.

1. Globe valve is suitable for the use of flow control and opening / closing fluid in uni-direction.
2. Short stroke of valve brings shorter operating.
3. As linear movement valve, long face to face dimension is featured for adopting long flow passage which is required to ensure smooth flow by valve without sudden revolution.

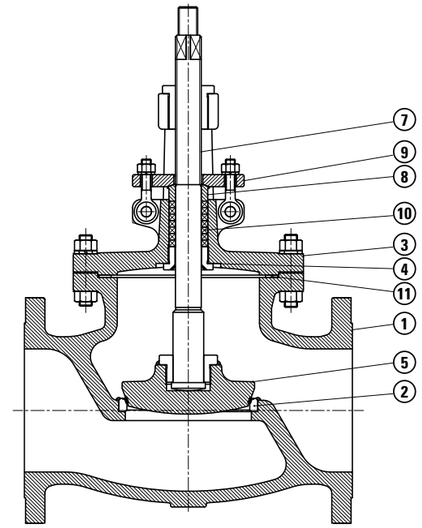
Operations

The following operation of the valve is available and the choice depends on the valve location, the type of work and service for each the valve is used.

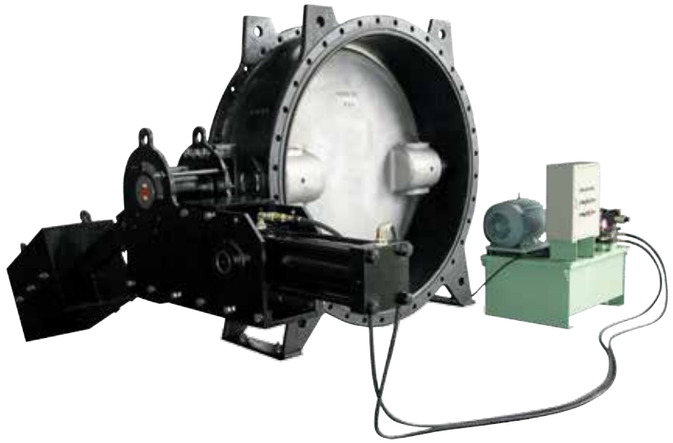
- Manual hand wheel Operation.
- Manual bevel gear Operation.
- Pneumatic actuator Operation.
- Hydraulic actuator Operation.
- Electric actuator Operation.

Part List

NO	PART NAME	MATERIAL
1	BODY	CAST STEEL / STAINLESS STEEL
2	BODY SEAT RING	STEEL WITH 13CR. FACED / STAINLESS STEEL
3	BONNET	CAST STEEL / STAINLESS STEEL
4	BUSH RING	STEEL WITH 13CR. FACED / STAINLESS STEEL
5	DISC	STEEL WITH 13CR. FACED / STAINLESS STEEL
7	STEM	STAINLESS STEEL
8	GLAND RING	STAINLESS STEEL
9	PACKING GLAND	CAST STEEL / STAINLESS STEEL
10	PACKING	NON-ASBESTOS
11	GASKET	NON-ASBESTOS



Combined Check Valves



Outline of Combined Check Valves

This valve is consisted of hydraulic cylinder, counter weight for emergency shut-off and hydraulic generator unit, etc.
In normal condition, it is used as a general valve. However, in emergency condition, (e.g.a power failure, in a words, a state of quick closing the valve when there are no other operating sources) all hydraulic circuits are converted to shut-off circuits which can close the valve by operation of weight for emergency shut-off and a lever.
Shut off speed can be adjusted by a relief valve on hydraulic generator unit.

Feature

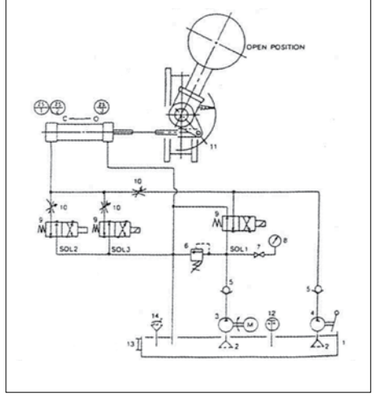
This valve has function as follows :

1. Open in normal position
2. Closed in normal position
3. Shut-off in case of emergency (Valve shut-off speed can be adjusted by two steps at site)
4. Intermediate open / close control

Part List

No	MATERIAL
1	OIL RESERVER
2	SUCTION FILTER
3	HYDRAULIC PUMP
4	MANUAL PUMP
5	CHECK VALVE
6	RELIEF VALVE
7	GAUGE COCK
8	PRESSURE GAUGE
9	SOLENOID VALVE
10	THROTTING VALVE
11	HYDRAULIC CYLINDER
12	LEVEL SWITCH
13	LEVEL GAUGE
14	OIL FILLING PORT
15	ARM
16	WEIGHT

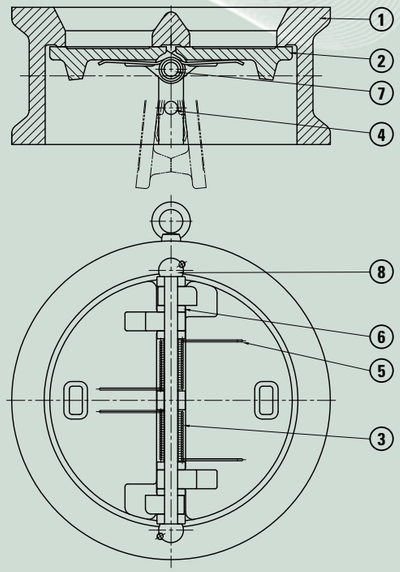
Piping Diagram



Dual Disc Check Valves

Dual Disc Check Valves are available for your process conditions:

- A complete range of sizes from 2 to 48 inch.
- A wide variety of cast fabricated materials for bodies, disc and trim for all types of service and temperature conditions.
- Designed and rated in accordance with API 594.
- For operational temperatures from -29°C to 815°C (depends on materials of construction).



1. One-piece body casting for maximum corrosion resistance.
2. Dual-Disc design for lightweight, small size, and strength.
3. Spring action closes each plate independently.
4. Stop pin.
5. Long-leg spring action eliminates seat scrubbing.
6. Hinge sleeve provides independent plate suspension.
7. Hinge pin.
8. Pin retainer.

Part List

No	PART NAME	MATERIAL
1	BODY	CAST IRON / DUCTILE IRON / CARBON STEEL SS. STEEL / NI-AL BRONZE
2	DUAL-DISC	STAINLESS STEEL / BRONZE / NI-AL BRONZE
3	SPRING	STAINLESS STEEL
4	STOP PIN	STAINLESS STEEL
5	SPRING-LONG	STAINLESS STEEL
6	LUG BEARING	TEFLON / STAINLESS STEEL
7	HINGE PIN	STAINLESS STEEL
8	PIN RETAINER	STAINLESS STEEL / MILD STEEL

Specification

1. STANDARD MATERIALS

Body : Mild steel, Stainless steel
Disc : Mild steel, Stainless steel
Stem : Mild steel, Stainless steel
Stopper : Mild steel, Stainless steel

2. THE BODY AND DISC

Materials are available in wide choice of steel or cast alloy options depending on customer's request.

3. SIZE : DN 50mm (2 inch) ~ DN 1500mm (60 inch)

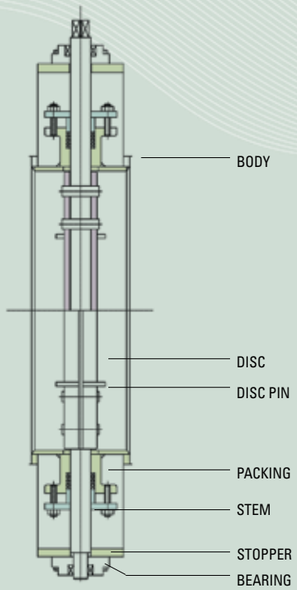
4. WORKING TEMPERATURE : 0°C ~ 500°C

5. FLANGE RATING

KS/JIS 5K, 10K
ASME Class 125LB, 150LB
EN/ISO PN10, PN16
Other flange available upon request

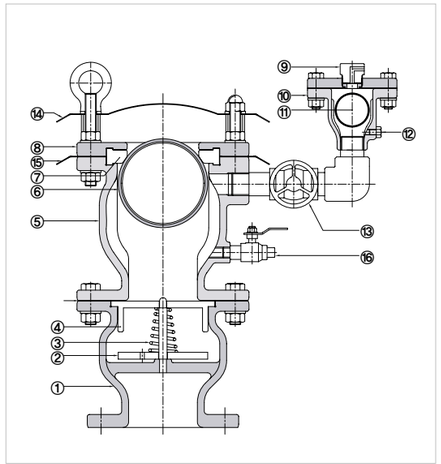
6. OPERATIONS

- Manual lever operation
- Manual gear operation
- Single or double acting pneumatic actuator operation
- Hydraulic actuator operation
- Electric motor actuator operation



Air Valves for Water Works (Single Orifice & Double Orifice)

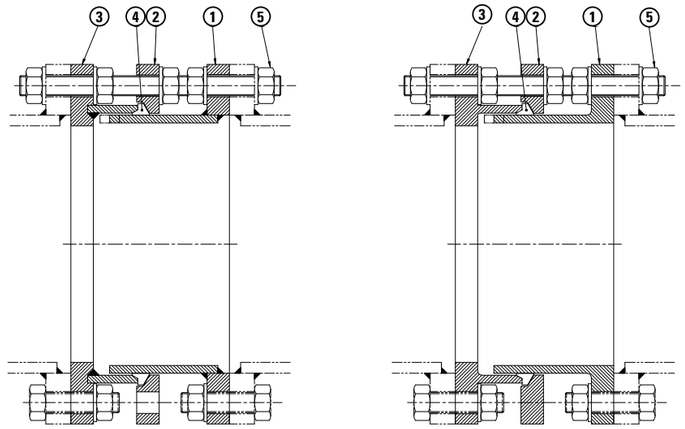
- Ace valve provides an automatic air exhaust function on the valve so as to avoid creating water hammer in the pipeline.
- Automatic exhaust of air in the pipeline will prevent the pipeline to be damaged by air pocket and ensure smooth water flowing.
- In order to perform good quality, strong abrasion-resistant bronze/ stainless steel / ductile iron coated with suitable paint for intended service etc. are used as shown on the material table.



Part List

NO.	PART NAME	MATERIAL
1	SURGE CHECK VALVE BODY	DUCTILE IRON / CAST IRON CAST STEEL / AL-BRONZE
2	DISC	BRONZE / STAINLESS STEEL
3	SPRING	MONEL / STAINLESS STEEL
4	SEAT	BRONZE / STAINLESS STEEL
5	AIR VACUUM VALVE BODY	DUCTILE IRON / CAST IRON CAST STEEL / AL-BRONZE
6	BALL	STAINLESS STEEL
7	SEAT GASKET	NBR / EPDM / VITON
8	COVER	DUCTILE IRON / CAST IRON CAST STEEL / AL-BRONZE
9	CAP	STAINLESS STEEL
10	AIR RELEASE VALVE BODY	DUCTILE IRON / CAST IRON CAST STEEL / AL-BRONZE
11	BALL	STAINLESS STEEL
12	DRAIN PLUG	BRONZE / STAINLESS STEEL
13	ISOLATING VALVE	BRONZE / STAINLESS STEEL
14	TOP COVER	STAINLESS STEEL
15	DRIP PAN	STAINLESS STEEL
16	BALL VALVE	BRONZE / STAINLESS STEEL

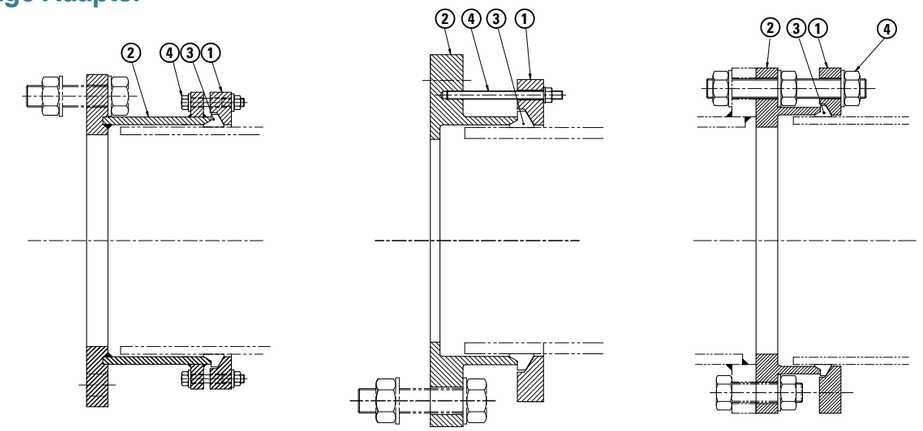
Dismantling Joint



Part List

NO	PART NAME	METERIAL
1	SPIGOT PIPE	DUCTILE IRON / CAST STEEL / STAINLESS STEEL / STEEL
2	MIDDLE RING	DUCTILE IRON / CAST STEEL / STAINLESS STEEL / STEEL
3	FLANGE ADAPTOR BODY	DUCTILE IRON / CAST STEEL / STAINLESS STEEL / STEEL
4	GASKET	EPDM / NBR / VITON
5	BOLT / NUT	STAINLESS STEEL / CARBON STEEL / MILD STEEL

Flange Adaptor

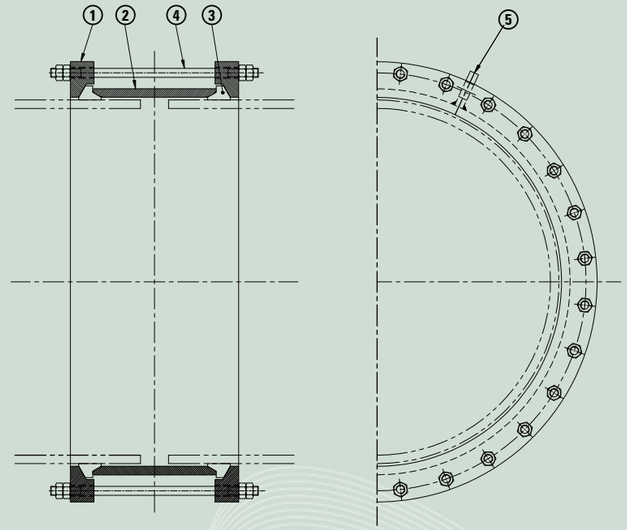


Part List

NO	PART NAME	METERIAL
1	MIDDLE RING	DUCTILE IRON / CAST STEEL / STAINLESS STEEL / STEEL
2	FLANGE ADAPTOR BODY	DUCTILE IRON / CAST STEEL / STAINLESS STEEL / STEEL
3	GASKET	EPDM / NBR / VITON
4	BOLT / NUT	STAINLESS STEEL / CARBON STEEL / MILD STEEL

Specification of Dismantling joint, Flange Adaptor, Flexible Coupling

Flexible Coupling



Part List

NO	PART NAME	METERIAL
1	END RING FLANGE	DUCTILE IRON / CAST STEEL / STAINLESS STEEL / STEEL
2	SLEEVE	DUCTILE IRON / CAST STEEL / STAINLESS STEEL / STEEL
3	GASKET	EPDM / NBR / VITON
4	BOLT / NUT	STAINLESS STEEL / CARBON STEEL / MILD STEEL
5	LIFTING LUG	DUCTILE IRON / CAST STEEL / STAINLESS STEEL / STEEL

Flexible Coupling is available for your process conditions :

·Size : 50mm ~ 4000 mm
·Coupling Spec : ASME/AWWA C219-01
·Flange Rating : KS, JIS, ASME, BS, DIN, AWWA, ISO
·Coupling Design Pressure : Up to 40bar

VALVE EXPERTS GROUP

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