MECHANIC AB
Manufacturer of Industrial Valves

T-Butterfly Valve

DN: 300-3000mm PN: 6-40 bar

Description

Butterfly valve with inflatable sealing is a kind of On/Off valve in fluid transfer systems that solve common problems in operating of butterfly valves such as:

- need for high operating torque
- sealing element distortion
- bypass line requirement for larger sizes

The sealing element of T-Butterfly valve consists of a circular T-cross section which is mounted in a slot of the valve body and by pressurizing on closing against the disk the valve will be sealed against the flow passage. The sealing element will be protected against floating objects in flow passage.

Technical specifications

- Centric construction type
- Adjustable and replaceable sealing element
- Higher life span in comparison with usual butterfly valves
- Sealing capability in both side of disk
- Lower operating torque
- No need for bypass line
- No friction between disk and seat during opening and closing of valve
- No sealing interruption even while sealing element destruction is happened
- Lower weight and dimension
- Tight sealing around shaft, resulting no contact of fluid and min. sedimentation
- Capability of installation at any direction
- Closing in clockwise direction
- Capable of installing electric, pneumatic and hydraulic actuators
- Final test according DIN EN12266 or ISO 5208
- Face to face based on DIN EN 558-1, Series 13,14
- Flange drilling according DIN EN 1092 (DIN 2501) or ISO 7005
- Multi turn actuator attachment according to ISO 5210
- Part turn actuator attachment according to ISO 5211
- Gearbox is tight sealed
- All bolts and nuts in contact with fluid are made of stainless steel
- Coating paint: epoxy powder paint with electrostatic process
- According to customer's order the valve will be constructed in fabricated steel or cast iron

Comparison of common Butterfly valve with single inflatable seal T-Butterfly valve

Common Butterfly valve

Single inflatable seal T-Butterfly valve

1 Sealing element placement

In Butterfly valves sealing element is mounted on disk, then while the valve is open, the sealing element is in contact with floating particles in flow, make it vulnerable for destruction.

In T-Butterfly valves sealing element mounted on the valve body, then provide protection against floating particles of flow and eliminating friction while the valve is being closed or opened.

2 Sealing problems due to distortion of sealing element

Even small amount of distortion in sealing element in butterfly valves can cause serious sealing problems. If so, the main should be depleted in order to replace the sealing element.

T-Butterfly valve sealing system offers the possibility of operating while the seating element has high level of distortion. This feature makes it possible to highly extend of valve life span.

3 Sealing mechanism

In Butterfly valves sealing element is mounted on disk, then during opening and closing, there will be traffic friction between disk and seat which make the sealing, but this is significantly shorten the life of the seal.

The inflatable sealing element of T-Butterfly valve consists of a circular T-cross section which is mounted in a slot of the valve body and by pressurizing against the rim of the disk, the valve will be sealed against the flow passage. The sealing element will be protected against floating objects in flow passage.

4 Sealing direction

Sealing ability of common butterfly valves, to some extend depend on the direction of exerted pressure. Preferred exerted pressure is in which the disk and sealing element be pushed against seat. So in occasions that sealing in both side is required, common Butterfly valves can Not be reliable.

T-Butterfly valve sealing system is design in a way that direction of pressure exerted have no effect in sealing properties.

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5 Torque required for opening and closing

Double eccentric Butterfly valves require more hydrodynamic torque.
Seating torque in double-offset design is proportional to the disk diameters (valve size). This torque is provided by valves gearbox.

Lower hydrodynamic torque is needed due to eccentric design in T-Butterfly valves.
Torque required to overcome bearing friction in Butterfly valves in comparison with T-Butterfly valves is high due to shaft with larger diameter requirement for common Butterfly valves.
During opening and closing of T-Butterfly valve there is no any friction between disk and seat, so there is no need for sealing torque.

6 Pressure balancing before opening valve for larger sizes and higher pressure rates

Torque required for opening and closing of valve is significantly increase by valve size. For sizes larger than 600mm there should be a bypass line. Prior to opening these valves in line, bypass line's valve should be opened in order to balance the pressure in both side of valve. In case of closing first main valve should be closed then bypass line's valve will be closed. Using bypass line will impose higher costs and need for larger installation space.

In T-Butterfly valve there is no need for bypass line for pressure balancing. T-Butterfly valve sealing system design in a way that when the sealing element depressurized the fluid will be able to pass through the valve to some extend; make it possible to balance the pressure in both side of valve.

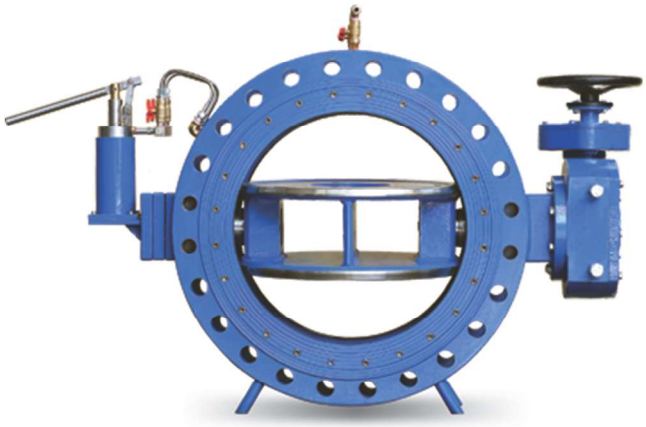
7 Dimention and Weight

Common Butterfly valves in comparison with T-Butterfly valves are bulkier, because:

- Higher torque is required for common Butterfly valve, then larger gearbox should be used
- Face to face standard based on DIN EN 558-1, series of 13 or 14
- T-Butterfly valve has same face to face dimension in comparison with Butterfly valve, make it possible to replace them without any significant change in line

Double inflatable seal T-Butterfly valve (Maintenance Free)

DN: 300-3000mm PN: 6-40 bar



Description

These valves include all features of single seal T-Butterfly valves and use two separate sealing system which make it more reliable.

Technical specifications

- Having double sealing system, operating separately
- Sealing element can be replaced, while the valve is in service
- Sealing capability in both side of disk
- Lower operating torque
- No need for bypass line
- No friction between disk and seat during opening and closing of valve
- No sealing interruption even while sealing element destruction is happened
- Lower weight and dimension
- Tight sealing around shaft, resulting no contact of fluid and min. sedimentation
- Capability of installation at any direction
- Closing in clockwise direction
- Capable of installing electric, pneumatic and hydraulic actuators
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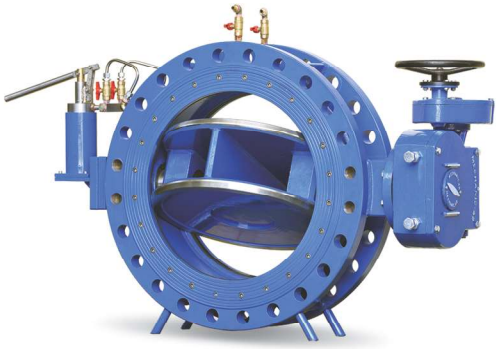
Comparison of common Butterfly valves with double inflatable seal T-Butterfly valves

Common Butterfly valve



Double inflatable seal T-Butterfly valve

Torque required for opening and closing

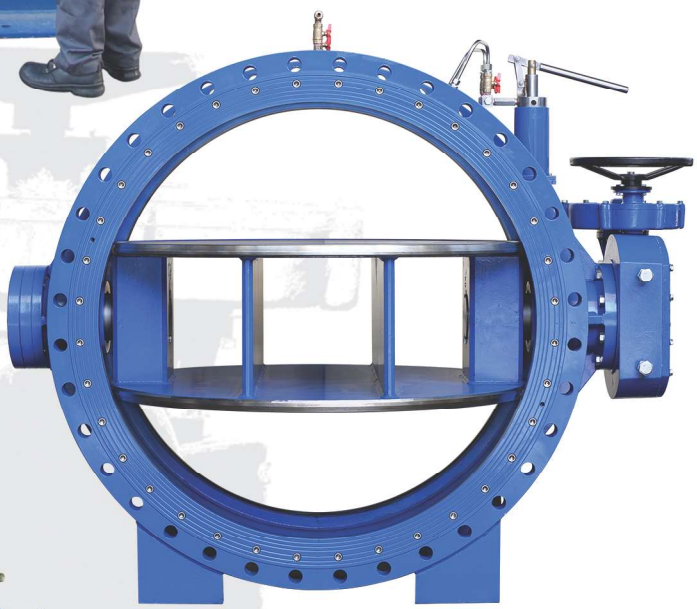
Sealing ability of common butterfly valves could be vulnerable in case of sealing element distortion. To fix this problem sealing element should be replaced. In order to replace sealing element main should be depleted. Now imagine a line in size of 1200mm and 5Km long, then 5650000 liters of water should be drained!

T-Butterfly valve with double sealing system ensure tight shot-off and highly reliable sealing feature. Having two separate sealing system make it possible when sealing element of one system is needed to be replaced, the other system be used to cut-off the flow in order to make it possible to replace defective sealing element without putting valve out of service.

T-Butterfly Valve DN2400 PN25

T-Butterfly valve DN700 PN40 with single inflatable seal Hydrostatic testing

T-Butterfly Valve DN2400 PN25



T-Butterfly Valve DN1400 PN40

T-Butterfly Valve DN700 PN40