



INSTALLATION, OPERATION AND MAINTENANCE MANUAL OF BUTTERFLY VALVE



Instructions

These instructions provide information about Wafer type Butterfly Valves. They are for use by personnel who are responsible for installation, operation and maintenance of Butterfly Valves.

Safety Messages

All safety messages in the instructions are flagged with an exclamation symbol and the word Caution, Warning or Danger. These messages indicate procedures that must be followed exactly to avoid equipment damage, personal injury or death.

Safety label(s) on the product indicate hazards that can cause equipment damage, personal injury or death. If a safety label becomes difficult to see or read, or if a label has been removed, please contact for replacement label(s).



WARNING!

Personnel involved in the installation or maintenance of valves should be constantly alert to potential emission of pipeline material and take appropriate safety precautions. Always wear suitable protection when dealing with hazardous pipeline materials. Handle valves, which have been removed from service with suitable protection for any potential pipeline material in the valve.

Inspection

Butterfly Valve has been packaged to provide protection during shipment, however, it can be damaged in transport. Carefully inspect the unit for damage upon arrival and file a claim with the carrier if damage is apparent.

Parts

Recommended spare parts are listed on the assembly drawing. These parts should be stocked to minimize downtime.

Order parts from your sales representative, or directly ordering parts, located on the data plate attached to the valve assembly. Also include the part name, the assembly drawing number, and the quantity stated on the assembly drawing.

Service

Service personnel are available to install, maintain and repair all products. We also offers customized training programs and consultation services.

For more information, contact us or visit our website.

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Description

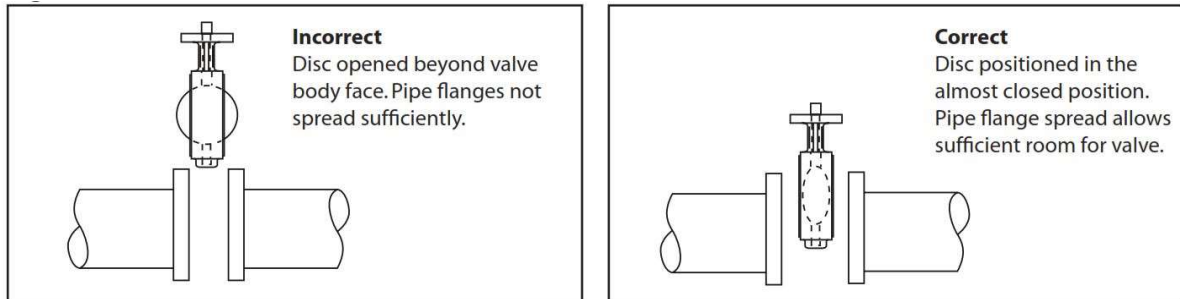
The Butterfly Valve is a resilient-seated valve for general industrial applications. Wafer end connections are offered, with a choice of disc, seat, and shaft materials. Pressure and temperature ratings are shown on the valve data plate.

Handling

Lifting the valve improperly may damage it. Do not fasten lifting devices to the actuator, disc or through the seat opening in the body. Lift the valve with slings, chains or cables fastened around the valve body, or fastened to bolts or rods through bolt holes in the flanges.

Installation

Initial Installation of Valve



Refer to the valve installation drawing for dimensional information.

- Installing the valve in the wrong location may cause excessive dynamic torque and damage the valve. Install the valve at least 8 pipe diameters downstream from the nearest pump or elbow.
- Pipeline flow may be in either direction through the valve. For optimum performance, install the valve with the higher pressure on the seat side of the valve (flat side of disc). If possible, install the valve with the shaft horizontal to provide a self-cleaning action on the seat.
- Use pipeline flanges that conform to PN10 / PN16 / ANSI B16.5 Class 150.
- Mount wafer body valves to the pipeline flanges with either bolts or studs that extend through both flanges:



CAUTION!

Lifting a larger size valve incorrectly can damage it. Do not fasten lifting devices to the actuator or disc, or through the seat opening in the body. Lift the valve with slings fastened around the valve body, or attach them to bolts or rods run through holes for the pipeline flanges.

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1. If the valve has been ordered without an actuator, mount the actuator on the valve.
 2. Before installation, remove all foreign material such as weld spatter, oil, grease, and dirt from the valve, flanges, and pipeline.
 3. Open the valve, and clean the seat and the sealing edge of the disc.
 4. Place the valve in the pipeline with the valve closed. Handle the valve carefully so that the integral flange sealing surfaces are not scratched or damaged. Do not use gaskets between valve and mating flanges.
 5. Ensure that the valve, the pipeline and the mating connections are aligned and centered before tightening the pipeline bolts.
 6. Open the valve slowly to ensure that there is adequate clearance between the open disc and the pipeline.
 7. Tighten the bolts evenly, in a crisscross pattern.

Operation

Clockwise rotation of the valve shaft closes the disc into the seat. The valve is fully closed when the flat side of the disc is parallel with the flange sealing surface on the body. The valve is fully open when the disc is 90° counterclockwise from the closed position. A machined flat on the top of the valve shaft corresponds to the flat side of the disc. The machined flat may be used to determine the approximate position of the disc when the disc is not visible.

The valve actuator is connected to the valve shaft, and positions the disc at the open, closed, or intermediate positions. The adjustable open and closed position stops in the valve actuator are set to match the open and closed positions of the valve. Refer to the Instructions for actuator / gear / hand wheel stop adjustment information.

General Maintenance

The following periodic preventative maintenance practices are recommended for all Center Line Butterfly Valves.

1. Operate the valve from full open to full close to assure operability.
2. Check flange bolting for evidence of loosening and correct as needed.
3. Inspect the valve and surrounding area for previous or existing leakage at flange faces or shaft connections.
4. Check piping and/or wiring to actuators and related equipment for looseness and correct as needed.

Lubrication

The valve is lubricated at the factory, and does not require routine lubrication. Refer to the actuator instructions for actuator lubrication requirements.

If the valve is disassembled, apply a paint-like coating of the below lubricant to the following surfaces:

1. The two shaft holes and lip seals in the seat.
2. The area of the seat adjacent to the two shaft holes.
3. The upper shaft seal.
4. The inside diameters of the shaft bearings.
5. The chamfer on the bottom end of the shaft.
6. The area of shaft just above the spline.

- For other valves with EPDM or NBR seat material, use Dow Corning 111 (no substitutes are allowed).

Parts Identification

Figure 1. Parts Identification (2" to 14")

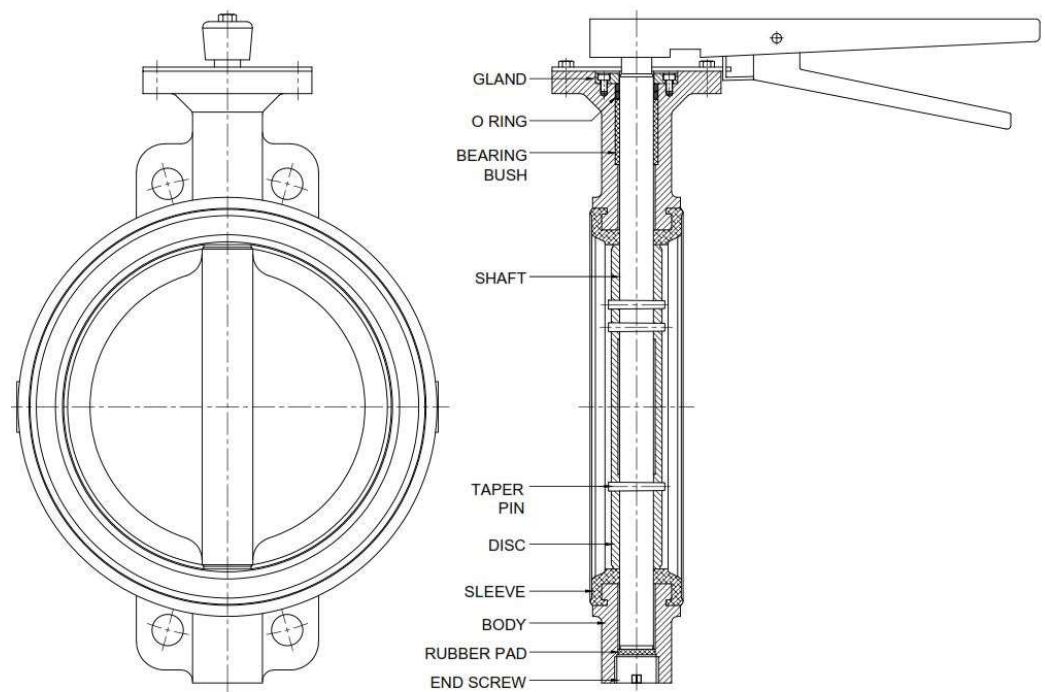
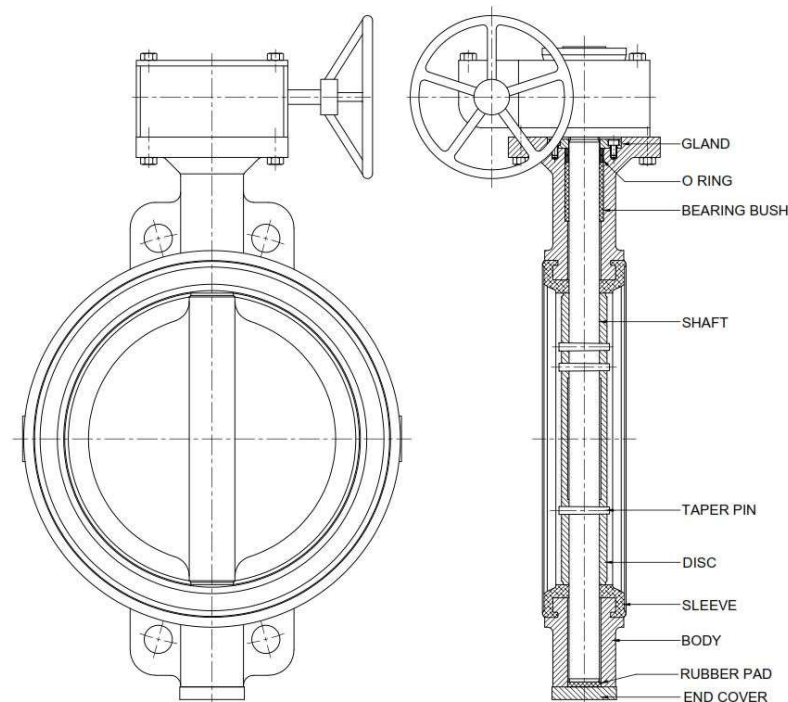


Figure 2. Parts Identification (16" to 24")



Removing Valve from Pipeline

Follow the steps below to remove the valve from the pipeline.



WARNING!

Loosening the flange bolts on a pressurized valve can allow the valve to suddenly shift position and release uncontrolled pipeline fluid. To avoid personal injury or pipeline damage, relieve the pressure in the pipeline before loosening the pipeline flange bolts.

1. Relieve pressure in the pipeline, and drain the pipeline.
 2. Close the valve.
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WARNING!

Moving parts from accidental operation of a powered actuator can cause personal injury or equipment damage. Disconnect and lock out power to actuator before servicing.

3. If the actuator is powered, disconnect and lock out the pneumatic, hydraulic, or electrical power to prevent accidental operation.
4. Support the valve, remove the flange bolting, and remove the valve from the pipeline. Refer to the lifting requirements in the “*Installation*” section.

Disassembling the Valve

Refer to Figure 1 & 2 for parts identification.

1. Remove the valve from the pipeline as described in the “*Removing Valve from Pipeline*” section.
2. Remove the actuator as described in the Actuator Instructions.
3. Remove the gland from the groove in the upper end of body.
4. Remove the bottom cover from bottom side of body, remove the thrust pad also from bottom end of body.
5. Remove the shaft from the disc, shaft towards the upper end of the body and remove the shaft from the body.
6. Remove the disc from the body.
7. Remove the upper bearing bush and ‘o’ ring from the upper body shaft bore.

Reassembling the Valve

Clean and inspect all parts, and replace worn parts.

1. Place the upper bearing bush and ‘o’ ring in the upper body shaft bore.
2. Assemble the disc in the body with the spline towards the bottom of the body aligning the disc shaft bore with the body shaft bores.
3. Assemble the shaft into the body and disc shaft bores until the spline in the shaft just contacts the disc spline (slight resistance will be felt between shafts and disc).
4. Position the flat on shaft so that it is parallel to and on the same side of the flat on the disc. Then slide and fully engage the shaft spline with the disc spline (shaft will bottom out in disc bore when fully engaged).
5. Assemble the thrust pad into the bottom side of body.
6. Assemble the bottom cover in lower body bore.
7. Mount the actuator on the valve as described in the “*Actuator*” instructions.
8. Install the valve as described in the “*Installation*” section. If the actuator is a powered actuator, re-connect the power and other connections.

Troubleshooting

Condition	Possible Cause	Corrective Action
Valve does not fully close.	Object is wedged between disc and seat	Open valve, and allow flow to remove object
	Closed position stop is not adjusted correctly.	Adjust closed stop.
	Disc-to-shaft connection has failed.	Replace shaft and/or disc.
Valve leaks when closed.	Closed position stop is not adjusted correctly.	Adjust closed stop.
	Seat is worn or damaged.	Replace valve or valve body.
	Sealing edge of disc is worn or damaged.	Replace valve or valve body.
Valve does not fully open.	Open position stop is not adjusted correctly.	Adjust open stop.
	Disc-to-shaft connection has failed.	Replace shaft and/or disc.
Opening or closing torque is excessive.	Bearings, shaft, disc or seat are dirty or worn	Clean or replace dirty or worn components.
	Shaft is bent.	Replace shaft.
Valve leaks between body and pipeline flanges.	Valve flange seal is damaged.	Replace valve or valve body.
	Flange bolts are tightened incorrectly.	Tighten the flange bolts evenly, in a crisscross pattern.
	Flange gaskets were used between valve and pipeline flanges.	Remove flange gaskets.
Media leaks between actuator and top of valve	'O' Ring leaking at top of shaft.	Inspect and replace 'O' Ring

Appendix

A1: References

Design Compliance: API 609

Face To Face Dimensions: API 609

End Connections: ASME B16.5 150# / IS: 1538 / IS: 1092-1 (PN10 & PN16)
/ IS: 1092-2 (PN10 & PN16)

Testing Std.: API 598 / BS EN 12266-1

A2: Tightening Sequence & Torque

The tightening sequence for all possible number of End flange bolting is beyond the scope of this manual. However, the logic to be followed is explained below

- Tighten the first four nuts in the sequence shown Fig.6. This helps in correct location of the mating parts.
- Tighten the other bolts in the sequence shown Fig.7 the same way.
- The sequence goes clockwise around the bolt
- Ensure that the recommended torque (refer Table1&2) is maintained in all bolting.

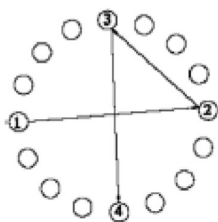


Fig. 5 Initial Tightening

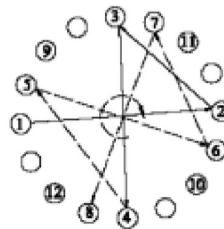


Fig. 6 Sequence of Tightening

Table 1 Tightening Torque values for Carbon steel bolting

Thread size	Torque (+/- 10%) (Nm)
M8	16
M10	32
M12	57
M16	140
M20	274
M24	473
M27	693
M30	940
M33	1280
M36	1644

Table 2 Tightening Torque values for Stainless steel bolting

Thread size	Torque (+/- 10%) (Nm)
M8	8
M10	15
M12	26
M16	65
M20	127
M24	219