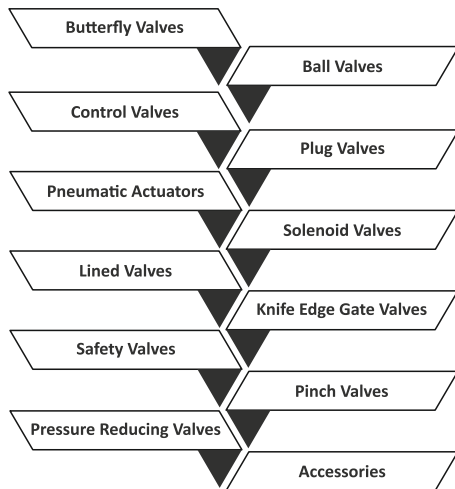


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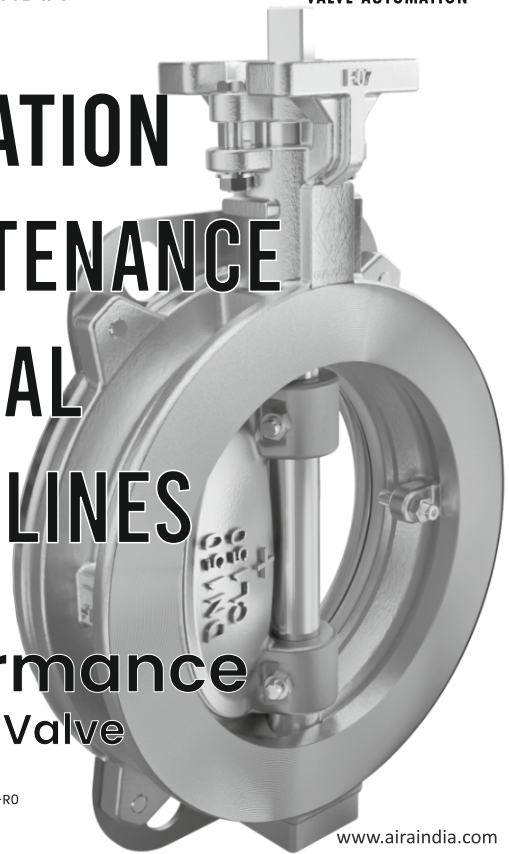
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OPERATION MAINTENANCE MANUAL GUIDELINES High Performance Butterfly Valve



IOM No: AEA-IOM-JMG-0024-R0

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Warning! – aira high performance Butterfly valves should never be installed where service conditions could exceed the valve ratings. Failure to heed warning may result in personal injury and/or property damage.

1. PRECAUTIONS

- ▶ **Safety first!** For your safety, take the following precautions before removing the valve from the line, or before any disassembly:
 - ▶ Be sure you know what fluid is in the line. If there is any doubt, double-check with the proper supervisor.
 - ▶ Wear any protective clothing and equipment normally required to avoid injury from the particular fluid in the line
 - ▶ Depressurize the line and drain the system fluid.
 - ▶ **DO NOT** pressurize the valve without an actuator mounted on it. **DO NOT** remove an actuator from a valve under pressure.
 - ▶ Before you install a valve in, or remove it from the line, cycle the valve fully closed. The valve must be removed from the line in the closed position or damage to the disc will result.

2. TRANSPORTATION, RECEIVING AND STORAGE

- ▶ Valve is being packed in Boxes or pallets while shipping to the customer, care should be Taken store them in a suitable place. We recommended storing the valves indoors in a dry and Dust free atmosphere while unpacking the valves Check that the valves and any other accessories have not been damaged during transportation

CAUTION: PLACING THE VALVES DIRECTLY ON THE GROUND OR ON A CONCRETE FLOOR SHOULD BE AVOIDED!

All wrapping and protection on valve should not be removed until the valve is ready for installation.

- ▶ Valves have preferred direction as per flow, for which arrow is shown on valve body as indication.
- ▶ When handing the valve either by hand or by mechanical means, special care should be taken not to damage the lever or gear operator. Lifting the valve casually may damage the valve components.

3. TOOL REQUIREMENT FOR LIFTING

- ▶ There are no special tools required for installation and maintenance that are not commercially available. Any lifting devices used to move the valve into a desired position shall be of sufficient size to support the weight of the valve and gear box assembly. Nylon slings secured around the valve bearing areas are recommended to reduce the possibility of mechanical damage occurring to the valve body and gear box. The assembly should never be lifted by the gear box.

4. INSTALLATION

- ▶ Read the **PRECAUTIONS** section carefully before installing the valve in line.
- ▶ When removing the valve from storage a careful check should be made to ensure that the valve has not been damage during the storage period.
- ▶ Valve should be checked for identification purpose and ensure that characteristics of valve matches to those specified for piping specifications. For the line where that is to be mounted. Nameplate gives the necessary information.
- ▶ Make sure the pipeline and pipe flange faces are clean. Any foreign material such as pipe scale, metal chips, welding slag, welding rods, etc., can obstruct disc movement or damage the disc or seat.
- ▶ Valve open or close position is indicated on the notch plate for lever operated valves or on the top of the gear operator for gear operator operated valves.
- ▶ Insert the valve between the flanges as shown in **figure (a)**, taking care not to damage the seat faces. Always pick the valve up by the locating holes or by using a nylon sling on the neck of the body
- NOTE: Valve must be closed Or partially open (disc 10°-15° open) position when the valve initially installing between the flanges (**Refer to figure (a)**).
- ▶ The butterfly valve must be centred between flanges to avoid disc-pipe contact which could damage the disc and shaft (**Refer to figure (a)**). Carefully open the disc to the full open position ,making sure the disc does not hit the adjacent pipe I.D.
- ▶ When you are sure about that valve installing in centre then secure the valve between flanges. Compress the flange gasket **EVENLY** by tightening the fasteners in an alternating sequence (**Refer to figure (b)**).
- NOTE: **DO NOT** fully tighten the flange fasteners initially.
- ▶ When you are full sure that the disc does not hit the adjacent pipe I.D. then full tightening the fasteners.

Figure [a] - INSERT BUTTERFLY VALVE
BETWEEN FLANGES

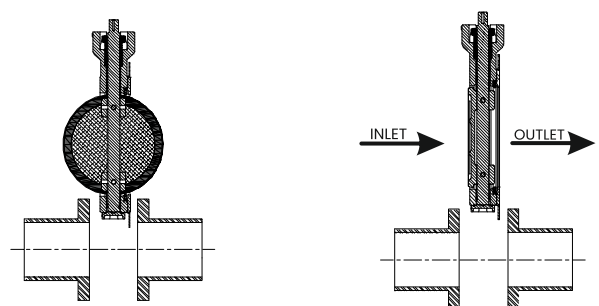
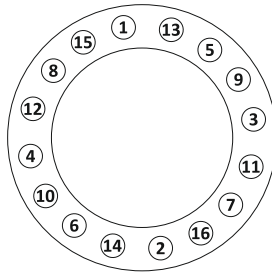
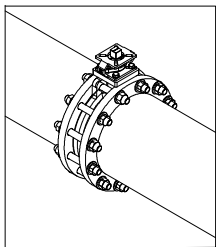
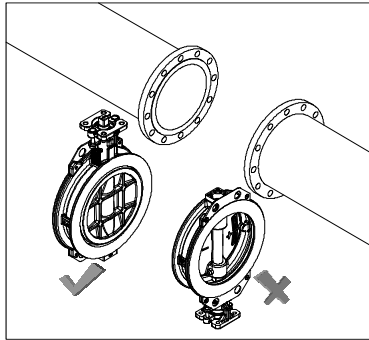


Figure [b]
Bolt Tightening



CORRECT
Sequence for
Tightening / Untightening



Centre valve, span body with bolts, but do not tighten slowly open disc to ensure that it clears adjacent pipe ID and leave as full open position tighten bolts in criss cross pattern.

3

4

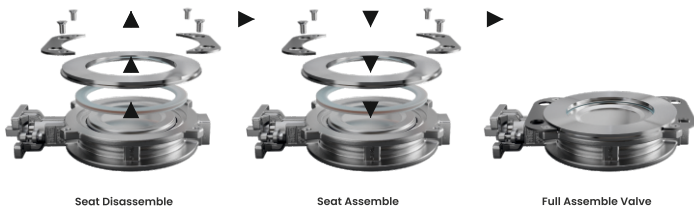


Figure [c]

6. GEAR OPERATOR MOUNTING/SETTING PROCEDURE (Refer image Figure-d)

1. Mount gear operator (Item 1) on top of butterfly valve with bolts and washers provided with each assembly.
2. Loosen the stop screws and locking nuts (Item 2, 3 & 4) approximately three to four turns on both sides of the gear operator.
3. Rotate hand wheel to the full open position and tighten the "open" stop screw (Item 4). Now tighten the locking nut (Item 2).
4. Rotate hand wheel to the full closed position and tighten the "Closed" stop screw (Item 3). Now tighten the locking nut (Item 2).
5. Open disc to 20% then back to closed position. Re-adjust stop screw and nut (Item 3) if necessary. You have now properly adjusted both the "Open" and "Closed" stop positions.

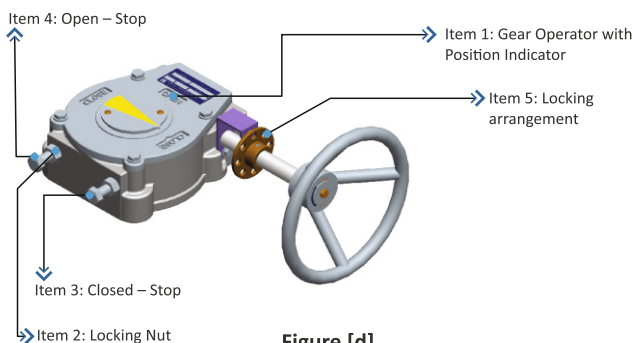


Figure [d]

5

5. MAINTENANCE

5.1 ROUTINE MAINTENANCE

- ▶ Routine maintenance consists of tightening down the compression plate periodically to compensate for seal wear. The valve should be closed during tightening. The compression plate, however, should not be tightened down too severely, since this will shorten the life of the seals. Overhauling the valve consists of seat, seals, and bearing replacement.
- ▶ Follow the disassembly and assembly instructions when overhauling the valve. All precautions should be taken as specified.

5.2 VALVE REMOVAL AND BENCH MAINTENANCE

- ▶ Read the PRECAUTIONS carefully.
- ▶ Valve must be fully closed before taking it out of the pipeline.

5.2.1 SEAT REPLACEMENT

1. After removal of the valve from the line, place it on a bench in a vice or suitable working space and cycle the valve open.
2. With the disc in the open position, remove the retainer using a rubber mallet or a rod of other soft material, with a hammer tap from the back, or shaft side of the valve.
3. Remove the seat, and discard it.
4. Clean the valve.
5. Carefully clean and polish the disc. It should be free of all grooves and scratches.
6. If the disc is slightly damaged it may be possible to smooth the sealing surface with crocus cloth, a fine stone, or the equivalent. If deep scratches are present replace the disc or return the valve to the manufacturer for service.
7. The disc must be kept in 10-15° open position at the time of replacing the disc seat.
8. Install the new disc seal and reassemble the seat retainer by tightening the fasteners in an alternating sequence. (Refer to figure (b)) Do not tighten the fasteners completely initially.
9. Using the operating device, open and close the valve disc at least 3 times to adjust the seat and seat retainer/segment to the proper position. Now open the valve disc to 10-15 degrees and now fully tighten the seat retainer fasteners.
10. Cycle the valve closed.
11. Cycle the valve fully closed, and compress the seat. Seat compression is accomplished when the valve is installed between flanges and the flange bolts are tightened.

5.2.2 SHAFT PACKING REPLACEMENT

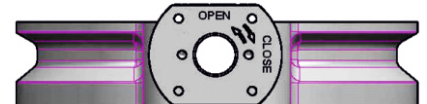
1. Remove the actuator/Gear box.
 2. Take off the gland by removing the gland fitting bolts & nuts.
 3. Remove the old shaft packing with a packing tool.
 4. Replace the old packing with new packing.
- NOTE: Keep the packing rings stacked in the same order as removed from kit.
5. Remove the spacer ring, only if complete disassembly is necessary.

5.2.3 SHAFT BUSH REPLACEMENT

1. Remove the stem square & flat ring.
 2. Use a soft rod and hammer to tap the bottom of the shaft. Remove it through the top of the valve.
- NOTE: In doing so, and freeing the disc, be careful not to scratch the sealing surface of the disc.
3. Remove the top shaft bush by pushing it up from the bottom
 4. Remove the bottom shaft bush by pushing it down from the top.
 5. To reassemble the valve, follow the instructions in the ASSEMBLY section.

7. BARE SHAFT PROCEDURE (Refer image)

Figure [e]



8. TROUBLESHOOTING

SYMPTOM of TROUBLE	POSSIBLE CAUSE	SUGGESTION
VALVE LEAKING		
Internal leaking through a SEAT	1. Valve not fully closed.	1. Cycle a valve and fully close.
	2. Wrong Gear/actuator setting.	2. Adjust Gear / actuator setting. (refer to the maintenance manual).
	3. Loosened seat retainer bolts.	3. Open the valve and Re-tighten the cap.
	4. Foreign material jammed on seats.	4. Open the valve and flush internal if a seat gets damaged by the foreign material, seat replacement be followed.
	5. Damaged seat or worn seat.	5. Replace a seat.
Internal leaking through a BODY or DISC	1. Loosened seat retainer bolt.	1. Open the valve and Re-tighten the cap bolts.
	2. Disc edge is worn or damage.	2. Consults manufacturer for potential application problem.
Leakage through body and flange fitting	1. Loosened flange fitting studs & nuts.	1. Tighten body & flange fitting studs & nuts.
	2. Uneven installation of valve in line.	2. Refer to installation procedure for correct installation of valve.
	3. Damaged raised face or damaged gasket.	3. Replace gasket or check for damaged raised face.
INSTALLATION		
Gear box interference with piping		1. Change an orientation of gear box.
		2. Install a valve with horizontally or Inclining perpendicular direction to the pipe.
OPERATION		
Valve not fully close/open	1. Offed alignment of gear with valve shaft.	1. Disassemble the gear box from a valve and re-align the valve and gear box having both valve and gear box at full closed position.
	2. Offed open/close setting.	2. Adjust close/open adjustment bolts of the gear box.
Shaft jammed	1. Galling between shaft and bush bearing.	3. Inject grease/lubricant oil. If not work then replace a bush bearing.
	2. Shaft damaged by galling/rust and/or foreign material trapped in stem journal.	4. Field repairing and/or replacement may not be possible. Please contact manufacturer.
Noise through packing	1. Over tightened packing.	1. Loosen the gland nut and cycle the valve and Re-tighten the gland nuts.
	2. Hardened packing.	2. Replace shaft Packing.
Valve won't rotate	1. Gear box has failed.	1. Repair or replace.
	2. Valve packed with debris.	2. Flush or clean valve to remove debris (check for damaged seats.)
	3. Shaft key has sheared.	3. Determine cause of shearing and replace.

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