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Dembla

Instruction Manual

Damper Valve Series-7100

1Feb 2009

Dembla

CONTENTS PAGE NO.

1.0 Foreword

1.1 Introduction

Dembla Butterfly Valves are available in Wafer & Flange type designs conforming to API 609 standard. The Disc construction is center disc & Shafts are guided by bearing.

1.2 Scope of Instruction Manual

This Instruction Manual covers information regarding Installation and Maintenance of Dembla's Butterfly Valve Wafer & Flange type Design with LDP Actuator & Elomatic (rotary) Actuator Series -7100

1.3 Copyrights and Modification Rights Reservation

Dembla Valves Ltd. retains the Copyright on the contents of this Instruction Manual. The Total content of this Instruction Manual described here corresponds to the Information during preparation of the Instruction Manual. It is user's responsibility to refer the latest version.

All data, specifications and Illustrations here are subjected to technical Modifications and improvements and hence Modification can be done by us at any time without any prior notice. No claim to Modification or repair of these Valves, which have already been supplied by us, can be made.

2.0 Storage & Preservation

All Valves are dispatched in the closed/open position as ordered and it is recommended that they are left in this position during storage. All protective packing should remain in position until the Valve is to be Installed. Valve should be stored in a clean and dry environment, without disturbing company setting. (e.g. Gland, Seat etc.) Protect it from shock & lifting damage.

⚠ Caution

If hoisting the valve, use a nylon sling to protect the surface. Carefully position the sling to prevent damage to Actuator tubing and any accessory. Also, take care to prevent people from being injured in case the hoist or rigging slips unexpectedly. For Valve Weight refer Valve Packing Slip.

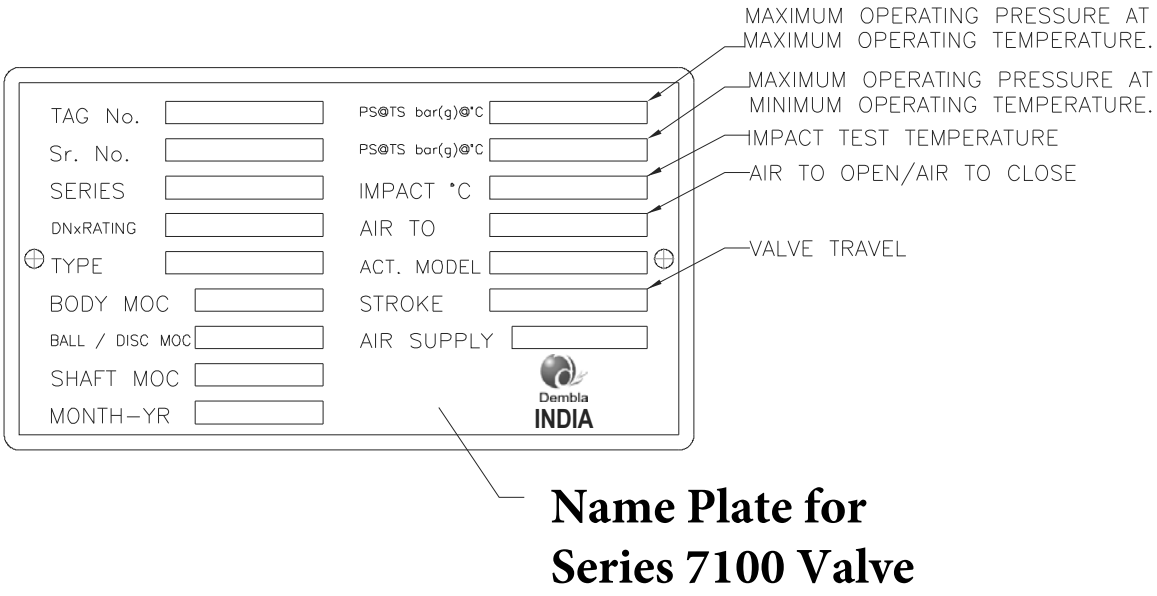
3.0 Valve Marking

1) Valve name plate attached on Valve by riveting carrying all Valve Identification Information.

2) Markings like Valve Size, Rating, Material etc. are as cast on Valve Bodies.

3) Valve Serial no. punched on Valve Body Flange for Valve Traceability.

4) If the product is not CE marked, Then name plate also without CE mark.



Name Plate for Series 7100 Valve

⚠ Warning

4.0 Health & Safety

1) Before attending to Valve Installation / Maintenance, the Instruction Manual must be compulsorily read and understood properly.
2) Valve must be operated by qualified personnel.
3) Ensure that the operator handling these Valves must follow Safety and Accident Prevention Rules and Regulations.
4) Follow the Safety Instructions before Installation, Maintenance or removing the Valve.
5) Always wear protective gloves, clothing and eyewear when performing any Installation operations to avoid personal injury.
6) All Safety Messages such as Cautions, Warnings and Notes are highlighted in this Instruction Manual which must be strictly followed to avoid any possibility of arising danger / risk of damage to the equipment / person's life
7) No Liability on Manufacturer for any wrong handling, improper commissioning and wrong assembly.
8) Line must be fully drained and de-pressurized before Installation or Maintenance of Valve.
9) Never handle Valves that have been used on harmful substances unless they have been completely decontaminated and certified safe to handle.
10) If the processes or environments that the products are used in are likely to cause temperature (high or low) that may cause injury to person if touched, then adequate insulation /protection must be fitted. It is recommended that the insulation allows easy access for Maintenance , to the sealant fittings , and to the Valve operator.
11) Valve must be protected from earthquake loading, traffic & wind.
12) No Modification / Conversions are allowed without written authorization from Dembla Valves Ltd.

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5.0 Unpacking

For Carton

- Keep Carton in position (Carton 'up side' should not be 'down').
- Cut plastic strip properly which is tied around Carton & remove it. (White in colour).
- Cut cello tape properly which is stuck on Carton opening.
- Open Carton properly.
- Remove foam properly along with polythene wrapping.
- Lift the valve properly & keep on clean & dry place

For Wooden Box

- Keep Wooden Box in Position ('upside' of wooden box should not be 'down').
- Cut iron strip properly which is tied around Wooden Box & remove it.
- Remove nail properly from top cover with proper equipment.
- Loosen and remove Valve fixing nut (from inside of Box).
- Lift the valve properly as shown in figure 1

6.0 Lifting Details

Valve should be lifted by using chain or bearer cables as shown in figure 1. (Take care that Valve should not damage while handing).

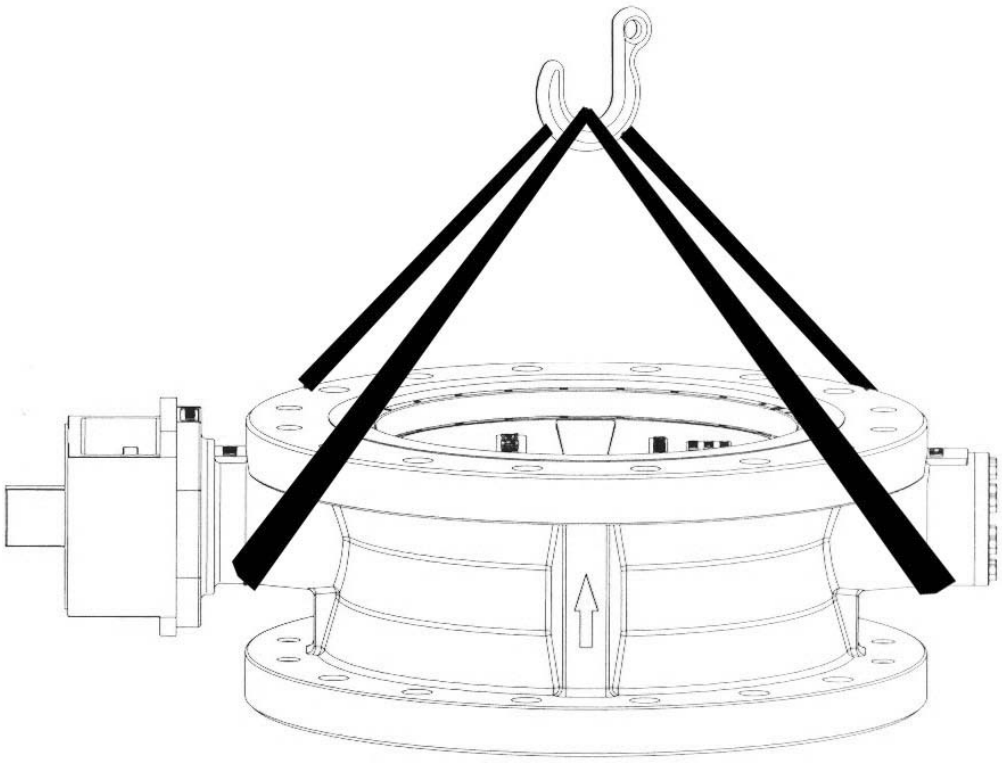


Fig .1

⚠ Warning

- Always wear protective gloves, clothing, and eye ware when performing any Installation operation to avoid personal injury.
- Valve should be used by End-user with same pressure & temperature rating which was given in Valve Marking (Name Plate) If there is any change please contact Dembla Sales Office.
- Avoid personal injury or property damage caused by components dropping .With the Valve or actuator upside, components may drop during disassembly or assembly. Be careful not to position yourself below the Valve in the path of falling parts.
- Personal injury could result from Packing Leakage. Valve Packing was tightened prior to shipment, but should there be any Gland Leakage after Installation, further tightening, just enough to stop Gland Leak is required. Excessive tightening will disturb Valve Calibration.
- Our Valves can not be used for Defence, Nuclear, Telecommunication, Marine, Railway and Laboratory & Mines.
- Our Valve is valid for atmospheres having pressure ranging for 0.8 bar to 1.1 bar and temperatures ranging for -20°C to +60°C
- Earthing facility must be provided by the end user before operating the Valve.
- Equipment should not be used for dead end service

After the Valve has been installed, make a final check of the following :-

1) An occasional cleaning of Valve Stem will prevent dirt or grit being carried away into the Packing.
2) Vary air lines and fitting to the actuator to ascertain actual Travel Scale Indication.
3) Check all air lines and fitting to the Valve Actuator & Accessories for air leaks.
4) Ensure that the combined action of Controller, Positioner and Valve provide the desired Valve Stem Movement. Also ensure the required fail safe position of control Valve.

⚠ Caution

- In case of leak, presence of high temperature may be dangerous to the person's life.
- Equipment to be used as per intended and not misused / improperly used to avoid dangerous effects such as over load ,over heating ,stress corrosion cracking, etc.

7.0 Installation of Butterfly Valve

7.1 Pre-Installation Checks: (Before installing any Butterfly Valve)

(1) Inspect it for any shipment damage and for foreign material that might have collected during Packing and shipment.

(2) Blow out all pipelines to remove pipe scale-chips, welding-slag, and other foreign materials.

(3) Install the Valve using accepted piping practices.

(4) Install the Valve according to flow direction marked on the Valve.

(5) Use self centering Gasket.

(6) Install the Control Valve preferably in a straight run of pipe away from bends or sections of abnormal velocity.

(7) Incorrect pipe alignment will cause interference between the disc edge and line Flange face, excessive torque and damage to Disc and Seat, resulting into Seat Leakage.

(8) Do not try to install Valve between line Flanges having inadequate gap. This may cause damage to some Valve parts. If Valve is in fully open position, it will impact the flanges and damage the disc edge.

(9) No butterfly Valve should be attempted to install when disc in open condition. The Butterfly Valve can be inserted between line Flanges in fully close position.

(10) Glands are factory tightened and checked for Leakage however if there is any Gland Leak in Valves, the Gland may be further tightened just enough to stop Leakage. Excessive tightening should be avoided.

(11) Connect the valve in pipe line with the standard connections.

7.2 Operation

Valve closes with clockwise rotation of the valve shaft. Valve is fully closed when disc is parallel to Seat Ring.

7.3 Lubrication

The Valve Body set does not require any routine lubrication. However Valve operator may require lubrication which is to be referred in the Part-II Manual Operator Section of this Instruction Manual.

8.0 Maintenance

⚠ Warning

- **Avoid personal injury or damage to process system from sudden release of pressure of process fluid.**
- **Before starting dis-assembly Use by-pass Valve or completely shut off the process to isolate the Valve from process pressure. Drain fluid from both ends of the Valve.**
- **Disconnect all operating lines providing air pressure, electric power or a control signal to the Actuator.**
- **Any gasket once removed should be replaced by a new one upon re-assembly. This is necessary to ensure a good seal since the used Gasket may not seal properly.**
- **Earthling facility and Valve parts (bush) should be checked periodically by the end user.**
- **Equipment should be cleaned regularly.**

9.0 Replacing Gland Packing

1) Isolate the Control Valve from line pressure & release the pressure.

2) Remove Actuator from Valve Body as shown in section 11.1 Removing Actuator from the Valve Body.

3) Remove the Nuts from Body Studs on Bonnet and lift the Bonnet carefully off the Body. If the Valve Plug & Stem assembly starts to lift along with bonnet, use a brass or Nylon hammer on the end of the stem & tap it back down.

⚠ Caution

Set the Bonnet on a protective surface to prevent damage to the bonnet Gasket surface.

4) Remove the Valve Plug & Stem assembly from the Body.
Handle the Plug & Stem carefully to avoid the damage at seating surface of & Stem diameter.

5) Unscrew and remove Gand Flange Nut.

6) Remove Gland Flange.

7) Push out Gland Packing from the Bonnets Bottom side Gland Packing& Spreader carefully take out by using a rounded rod or other tool that will not scratch but clean the stuffing box wall.

8) Install Plug & Stem assembly. Then slide the Bonnet over the Stem and on to the Body Studs.

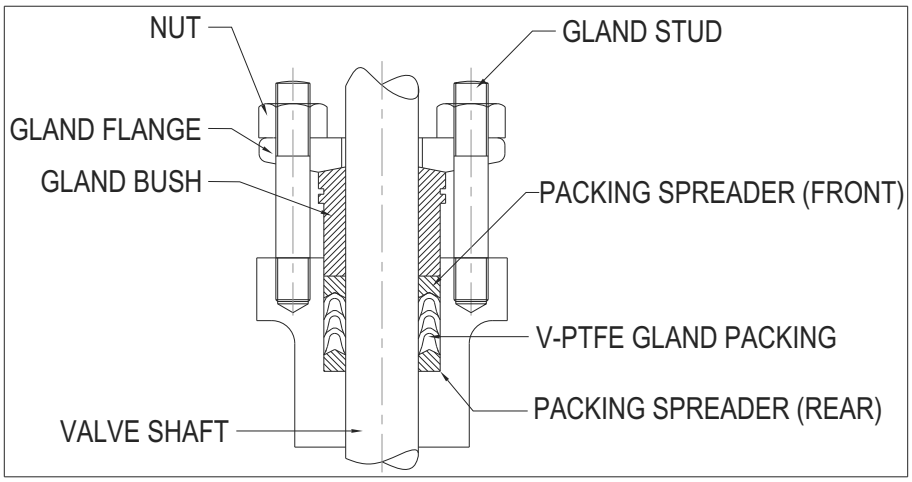
9) Install new Packing Seal & Metal Gland parts according to the appropriate arrangement.

10) Lubricate the Body Studs and install the Nuts. Use accepted bolting procedure during tightening so that the Body to Bonnet joint will with stand test pressures and application service condition, before tightening Nuts make sure that Plug & Stem assembly is properly aligned with Seat Ring.

11) For the installation of Gland Packing refer following 9.1 to 9.6

12) Mount the Actuator & Connect Stem Connector as specified in the Reassembly of Actuator on Valve Body Refer Section 11.0 of this manual.

9.1 V-PTFE Packing



This Gland Packing consists of 1 Rear Packing Spreader, 1 set of V-PTFE Gland Packing and 1 Front Packing Spreader.

(1) Place the V-PTFE Gland Packing set in the Body after 1 Rear Packing Spreader followed by Front Packing Spreader as shown in Fig. 9.1 Lubrication is not required.

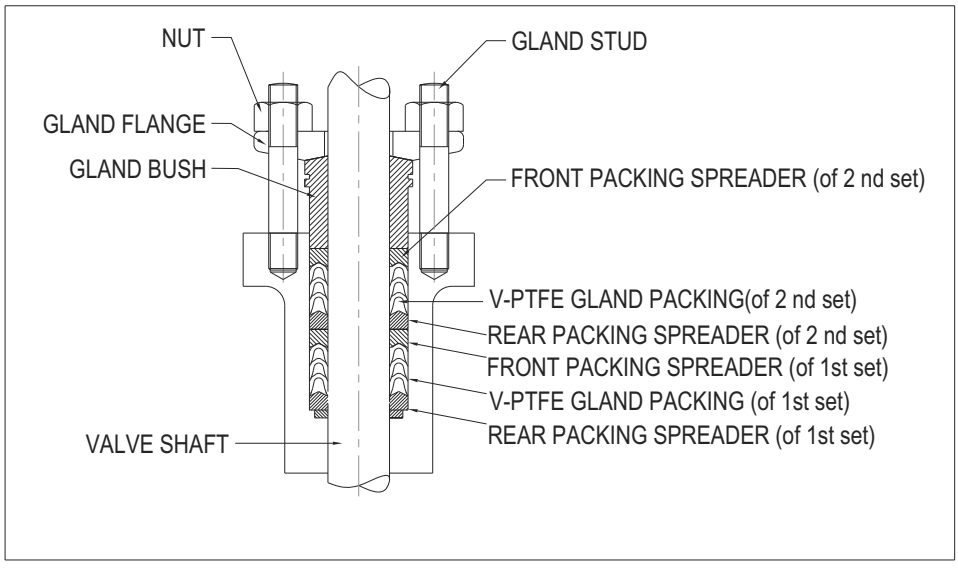
⚠ Caution

Push each V-PTFE Packing carefully inside to avoid the Packing lip to bend towards the outer side.

(2) Insert the Gland Bush.

(3) Insert the Gland Flange on Gland Studs and tighten their Nuts to specified torque.

9.2 Double V-PTFE Packing



This Gland Packing consists of 1st set of Front and Rear Packing Spreader, 1st set of V-PTFE Gland Packing, 2nd set of Front and Rear Packing Spreader & 2nd set of V-PTFE Gland Packing.

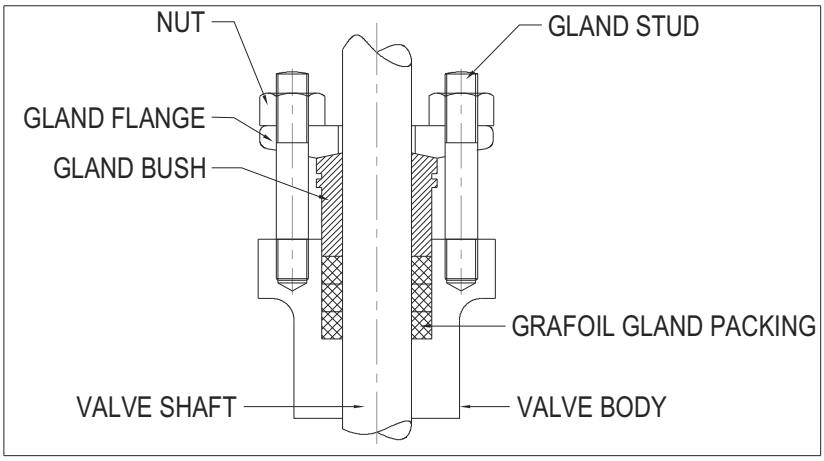
1) Place the 1st set of V-PTFE Gland Packing after Rear Packing Spreader of 1st set followed by the Front Packing Spreader of 1st. set.

2) On the Front Packing Spreader of 1st. set place the 2nd set of V-PTFE Gland Packing after Rear Packing Spreader of 2nd set followed by the Front Packing Spreader of 2nd set.

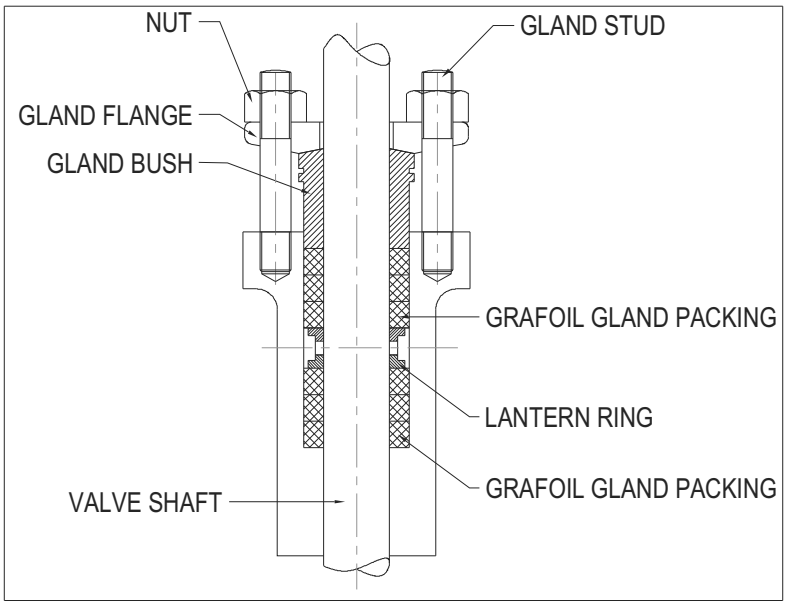
3) Insert the Gland Bush.

4) Insert the Gland Flange on Gland Stud and tighten their Nuts to specified torque.

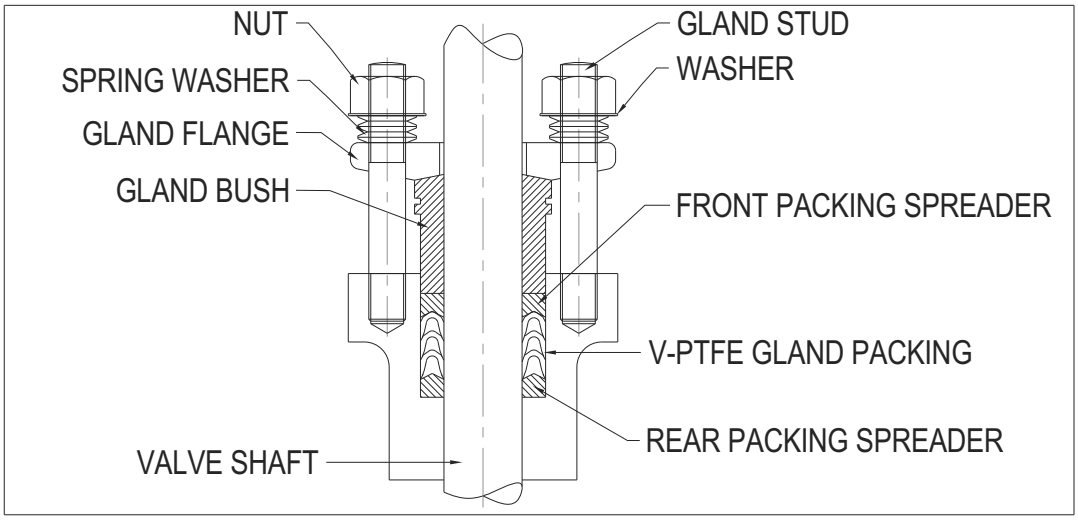
9.3 Grafoil Packing



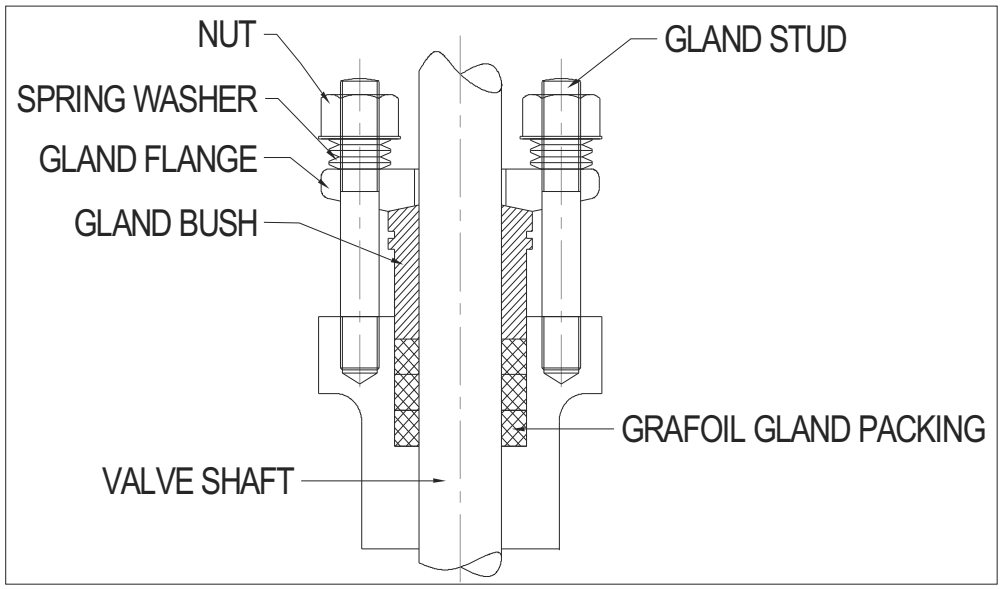
9.4 Double Grafoil Packing



9.5 V-PTFE Low Fugitive Emission Packing



9.6 Grafoil Low Fugitive Emission Packing



10.0 Replacing Guide Bush (Bearings)

(1) Isolate the Control Valve from line pressure And release the pressure.

(2) Remove the complete Valve from the pipe line.

(3) Remove the Gland Packing. (Refer. 9.1 to 9.6)

(4) Remove the Locking Pin from Disc by slight Hammering. (Upper & Lower)

(5) Remove Bottom Cover Bolt.

(6) Remove Bottom Cover with Gasket.

(7) Hold Disc properly.

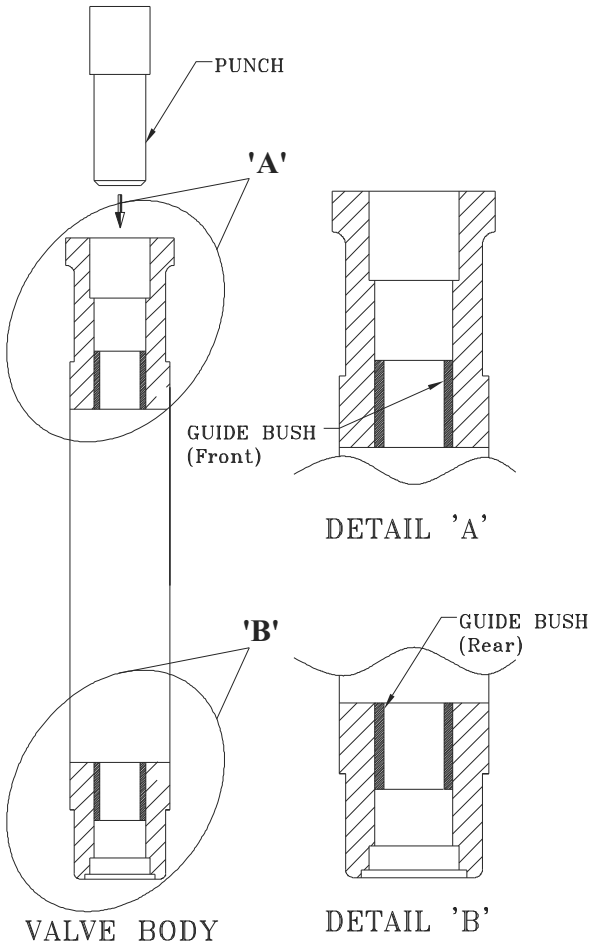
(8) Remove Upper & Lower Shaft.

(9) Now slowly remove the Guide Bush by slightly hammering by a pusher tool avoiding scratches in the Valve Body.

(10) Replace the Guide Bush with new one.

(11) Keep all part on clean & dry space.

(12) Use reverse sequence for reassembly.



10.1 Trouble Shooting

No.	Condition	Possible Cause	Corrective Action
1	Gland Leakage	Gland Nut loose	Adjust Gland Nut
		Worn out Packing	Replace Gland Packing
3	Valve does not open / close fully	Limit stop got disturbed	Adjust limit stop
		Disc to shaft connection failed	Replace disc pins and/or shaft
4	Opening / Closing torque excessive	Excessive dirt accumulated at the components	Clean the components
		Shaft , bearings or seat worn out	Replace the worn out components

10.2 Torque for Studs

Studs	Torque Nm
5/16	5
3/8	7
1/2	30
5/8	50
3/4	170

11.0 Actuator Maintenance

11.1 Removing Actuator from Valve Body (refer Fig. 1)

⚠ Caution

Before removal of Actuator disconnect the air supply from Actuator ,

1. Unscrew and remove Stem Connector Bolt that is used to connect the Valve Shaft and the Lever Shaft.
2. Unscrew and remove the Actuator mounting bolts that are used to fix Lever Box to the Mounting Bracket & thus separate the two main units.
3. Pull away Actuator along with the Lever Shaft and separate it out from the Valve Body. (Actuator bracket shall remain connected with Valve Body.)

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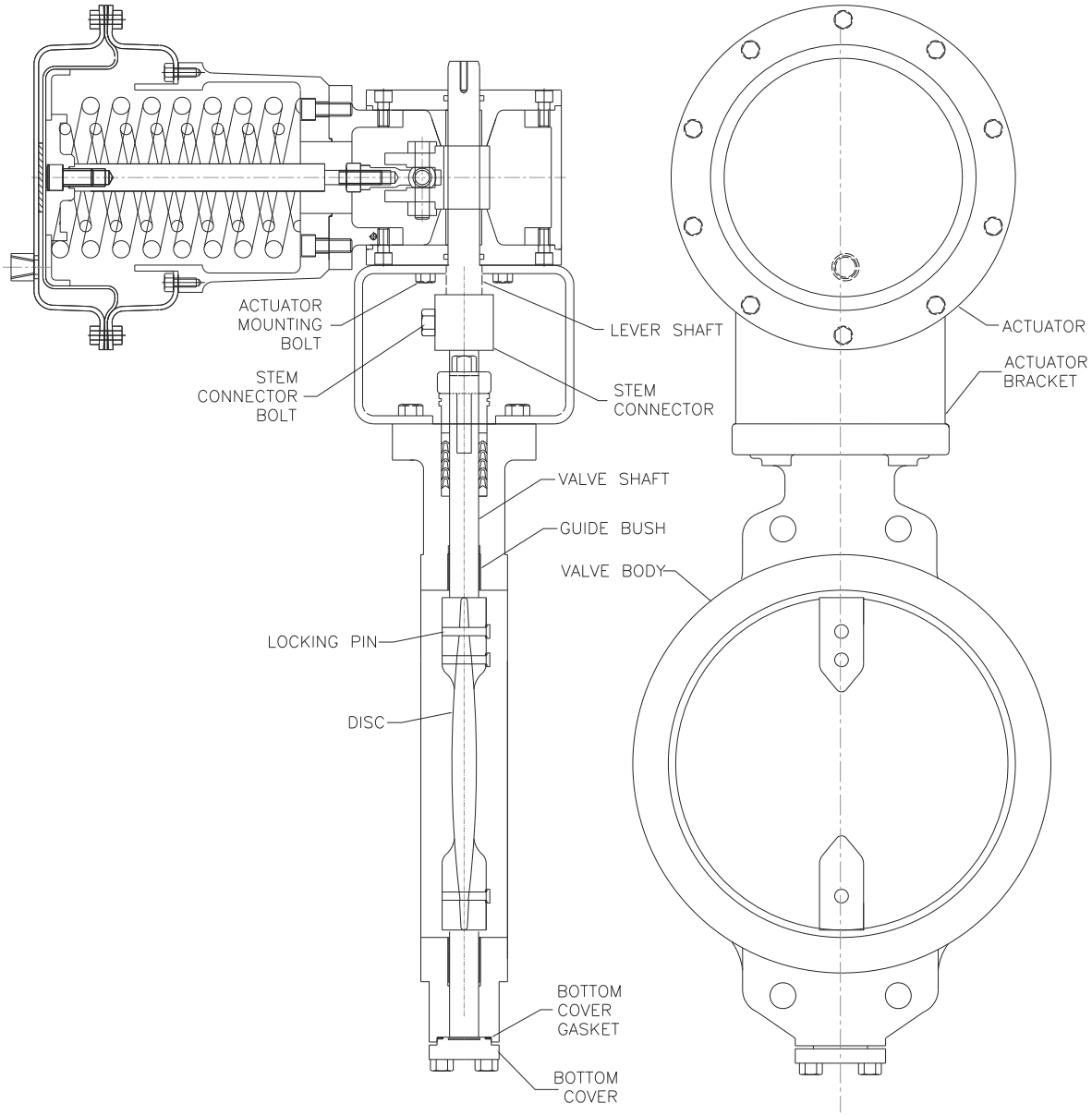
For LDP 0Actuator Detail Refer Instruction Manual Diaphragm Actuator Single Acting Series LDP.



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Exploded View of LPD Actuator Assembly on Valve

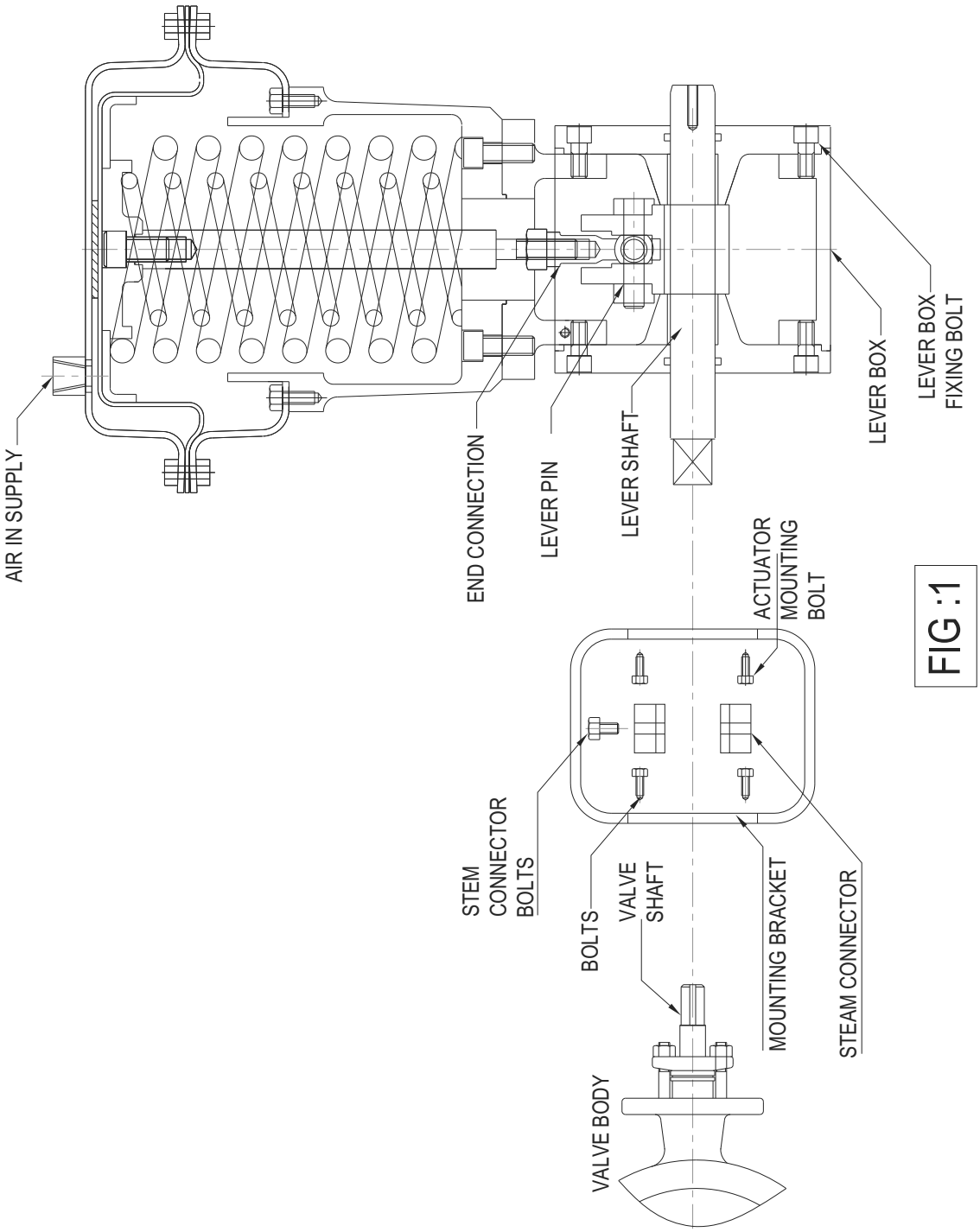
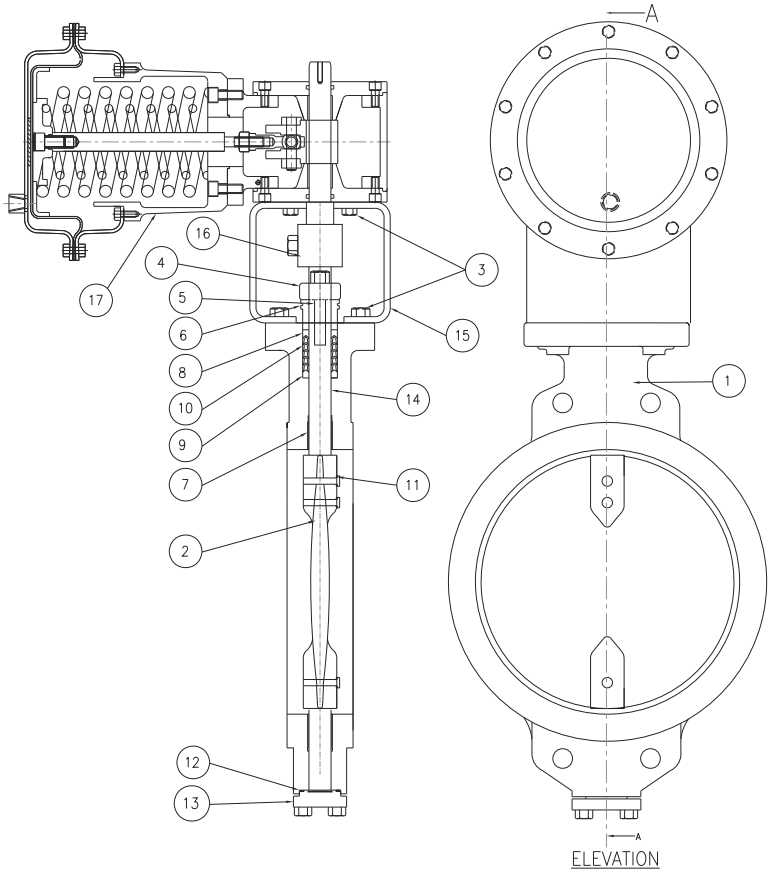


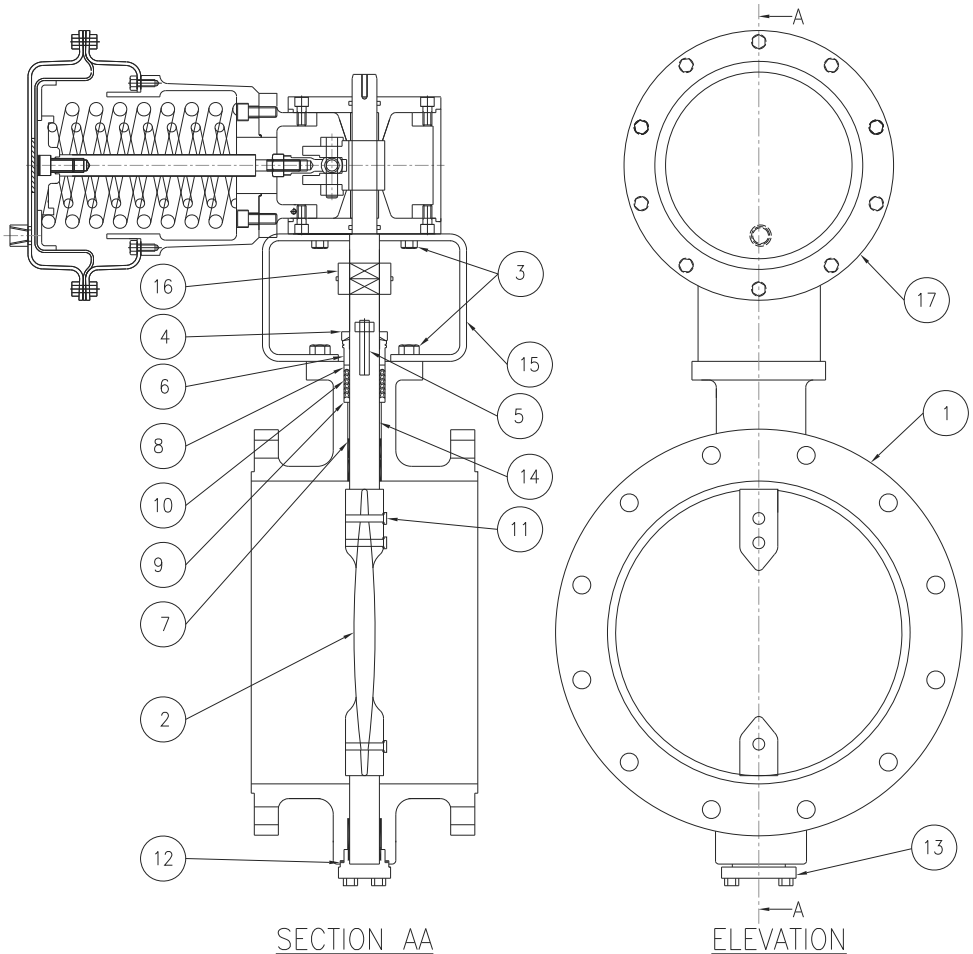
FIG :1

12.0 Parts Illustrated (Butterfly Valve Assembly Wafer Type With LDP Actuator)



No.	PART	QTY.
1	BODY	1
2	DISC.	1
3	MOUNTING BOLT	4
4	GLAND FLANGE.	1
5	GLAND STUD/NUT.	2
6	GLAND BUSH	1
7	GUIDE BUSH.(BEARING)	2
8	PACKING SPREADOR–FRONT	1
9	PACKING SPREADOR–REAR	1
10	GLAND PACKING.	1SET.
11	DISC LOCKING PIN.	3
12	GASKET– BODY TO BOTTOM COVER.	1
13	END COVER.	1
14	VALVE SHAFT	1
15	ACTUATOR MOUNTING BRACKET	1
16	SHAFT CONNECTOR	1
17	LDP ACTUATOR	1

13.0 Parts Illustrated (Butterfly Valve Assembly Flange Type With LDP Actuator)



No.	PART	QTY.
1	BODY	1
2	DISC.	1
3	MOUNTING BOLT.	1SET.
4	GLAND FLANGE.	1
5	GLAND STUD/NUT.	2
6	GLAND BUSH	1
7	GUIDE BUSH.(BEARING)	2
8	PACKING SPREADOR–FRONT	1
9	PACKING SPREADOR–REAR	1
10	GLAND PACKING.	1SET.
11	DISC LOCKING PIN.	3
12	GASKET– BODY TO BOTTOM COVER.	1
13	END COVER.	1
14	VALVE SHAFT	1
15	ACTUATOR MOUNTING BRACKET	1
16	SHAFT CONNECTOR	1
17	LDP ACTUATOR	1

14.0 To Separate Actuator From Valve Body.

⚠ Caution

Before starting disassembly.

- **Use by-pass Valve or completely shut off the process to isolate the Valve from process pressure. Drain fluid from both ends of the Valve.**
- **If the Valve opens with Pneumatic signal pressure to actuator, remove air from the Actuator before attempting to remove Valve from line.**
- **While dismantling the Valve, if any part is stuck up, do not use any pressure or force technique. Use proven methods only.**

1. Unscrew the Stem Connector Bolts & take out two halves of Stem Connector.
2. Unscrew & remove the Actuator Mounting Bolts which connect the Actuator to the Mounting Bracket.
3. Lift the Actuator along with Pinion Shaft & remove Pinion Shaft from Actuator.

For Rotary Actuator Detail Refer Instruction Manual for Rotary Actuator

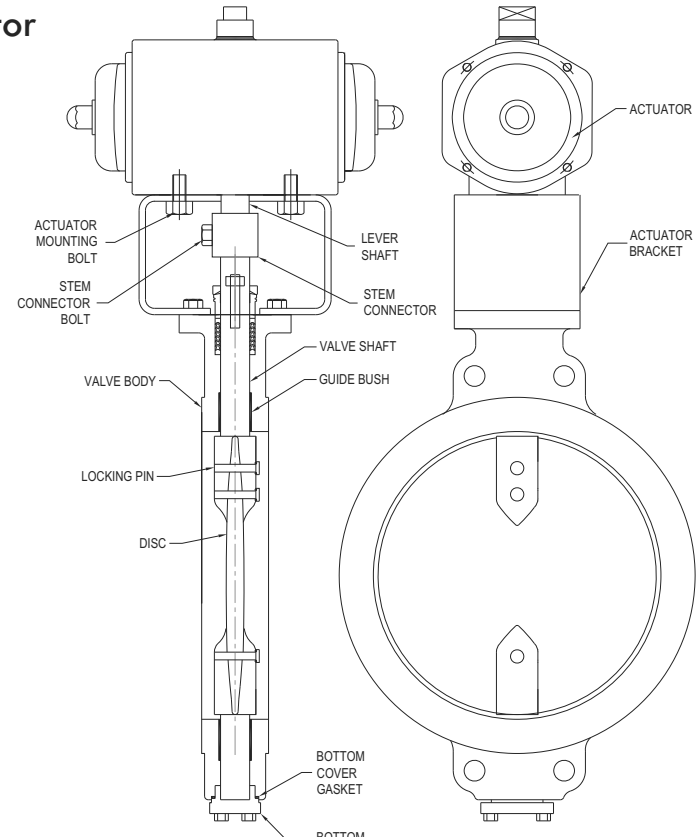


Fig No.3

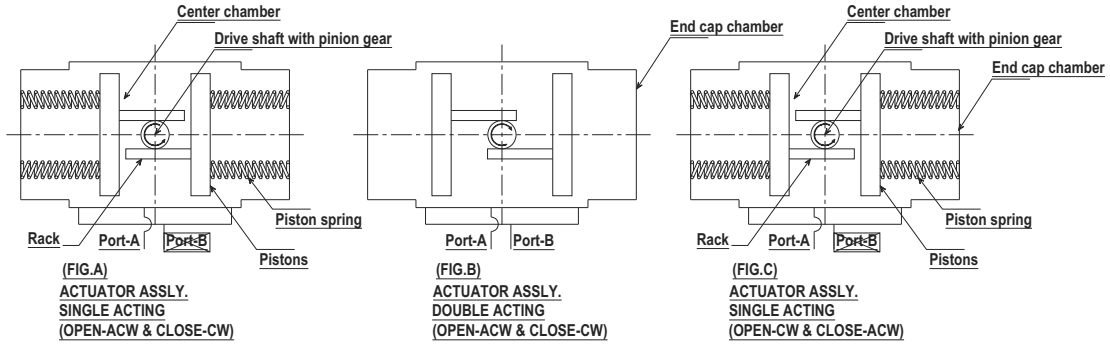
15.0 Actuator Operation

The Actuator drive Shaft rotates through a full 90^0. Rotation is accomplished by feeding supply air into the center chamber (through Port A) forcing the two opposing Pistons outward, resulting in anti-clockwise rotation of the drive Shaft to the 'Open' position. (Refer Fig.A)

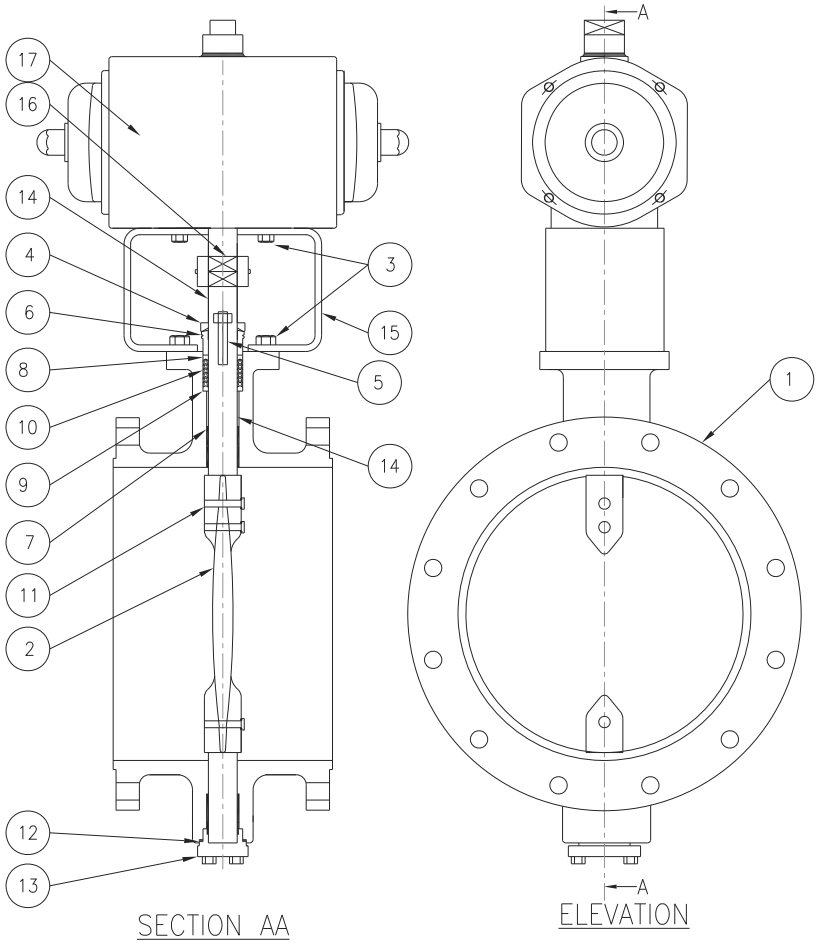
For closure is accomplished by means of Springs contained in the end cap chambers, which force the pistons inward when the supply air to the center chamber (Port A) is allowed to exhaust. (Refer Fig.A)

For Double-Acting Actuators, Rotation is accomplished by feeding supply air into the center chamber (through Port A) forcing the two opposing Pistons outward, resulting in anti-clockwise rotation of the drive Shaft to the 'Open' position, for closure is obtained by feeding supply air into the end cap chambers (through Port B) which forces the pistons inward, resulting in clock-wise rotation of the drive Shaft. (Refer Fig.B)

To reverse the stroke direction of the Actuator, remove both Pistons, rotate them by 180^0 and Re-install. This will reverse the direction of rotation of the output Shaft. (Refer Fig.C)

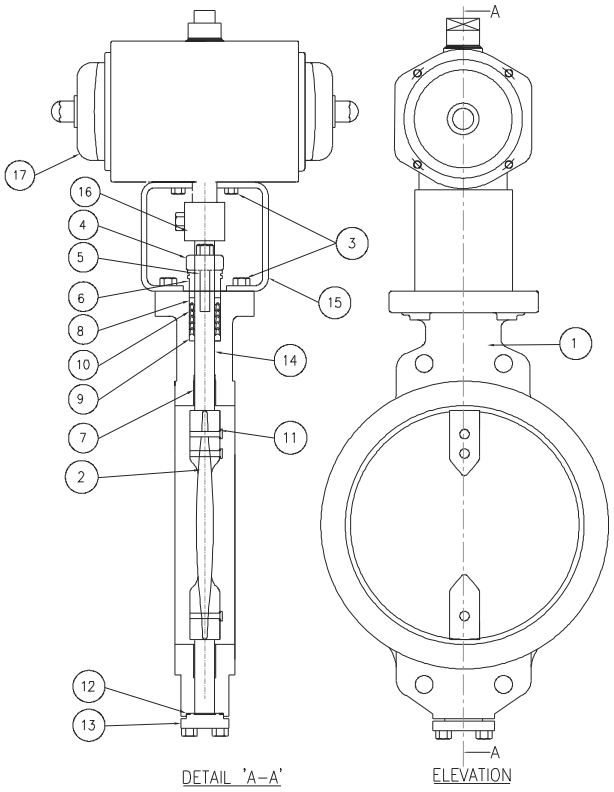


16.0 Parts Illustrated (Butterfly Valve Assembly Flange Type With Rotary Actuator)



No.	PART	QTY.
1	BODY	1
2	DISC.	1
3	MOUNTING BOLT.	4
4	GLAND FLANGE.	1
5	GLAND STUD/NUT.	2
6	GLAND BUSH	1
7	GUIDE BUSH.(BEARING)	2
8	PACKING SPREADOR–FRONT	1
9	PACKING SPREADOR–REAR	1
10	GLAND PACKING.	1SET.
11	DISC LOCKING PIN.	3
12	GASKET– BODY TO BOTTOM COVER.	1
13	END COVER.	1
14	VALVE SHAFT	1
15	ACTUATOR MOUNTING BRACKET	1
16	SHAFT CONNECTOR	1
17	ROTARY ACTUATOR	1

17.0 Parts Illustrated (Butterfly Valve Assembly Wafer Type With Rotary Actuator)



No.	PART	QTY.
1	BODY	1
2	DISC.	1
3	MOUNTING BOLT	4
4	GLAND FLANGE.	1
5	GLAND STUD/NUT.	2
6	GLAND BUSH	1
7	GUIDE BUSH.(BEARING)	2
8	PACKING SPREADOR-FRONT	1
9	PACKING SPREADOR-REAR	1
10	GLAND PACKING.	1SET.
11	DISC LOCKING PIN.	3
12	GASKET- BODY TO BOTTOM COVER.	1
13	END COVER.	1
14	VALVE SHAFT	1
15	ACTUATOR MOUNTING BRACKET	1
16	SHAFT CONNECTOR	1
17	ROTARY(ELOMATIC) ACTUATOR	1

18.0 Recommended Spare Parts (for Butterfly Valve)

It is recommended to stock the following Spares Parts for commissioning and routine service.

No.	PART NAME	RECOMMENDED QUANTITY
7	Guide Bush Bearing	One for every Five identical or minimum One set.
10	Gland Packing	One Set for every Two identical or One Set minimum.

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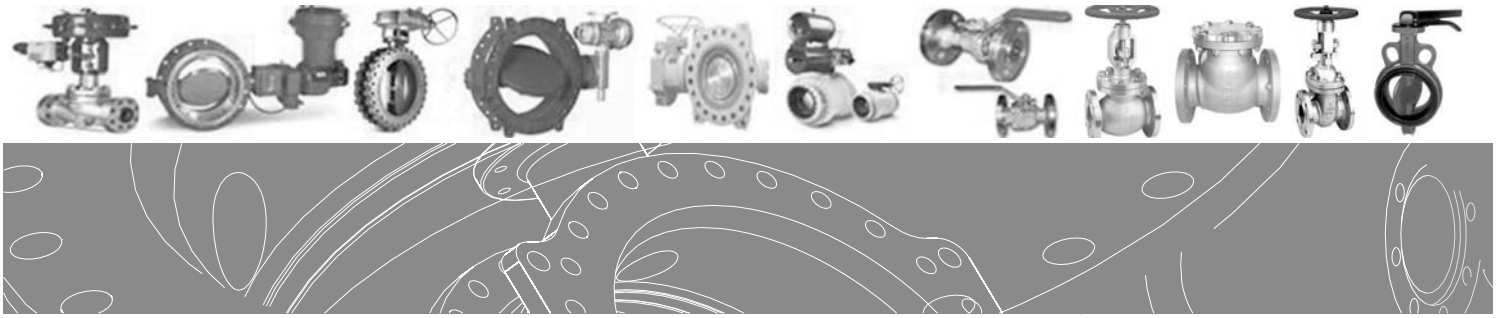
Valve Disposal Detail : After the complete use of valve. Dispose the valve with accessories as per your local laws.



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