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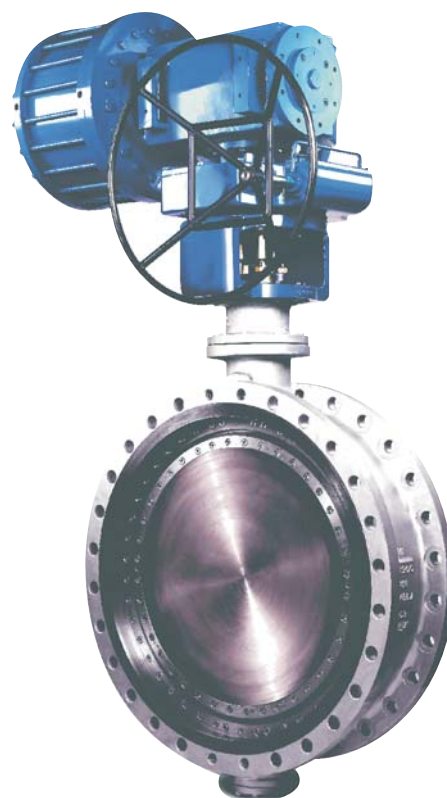
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SIGNATURE	Design Department	SIGNATURE	CTO
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Instruction Manual

Triple Offset Butterfly Valve Series 7600



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1.0 Foreword

1.1 Introduction

Dembla High Performance Triple offset Butterfly Valves are available in Flange type designs conforming to API 609 standard. The Disc construction is Triple Offset. Shaft are Guided by Bearing.

1.2 Scope of Instruction Manual

This Instruction Manual covers information regarding Installation and Maintenance of Dembla's Triple Offset High Performance Butterfly Valves Flange type, Series 7600.

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.

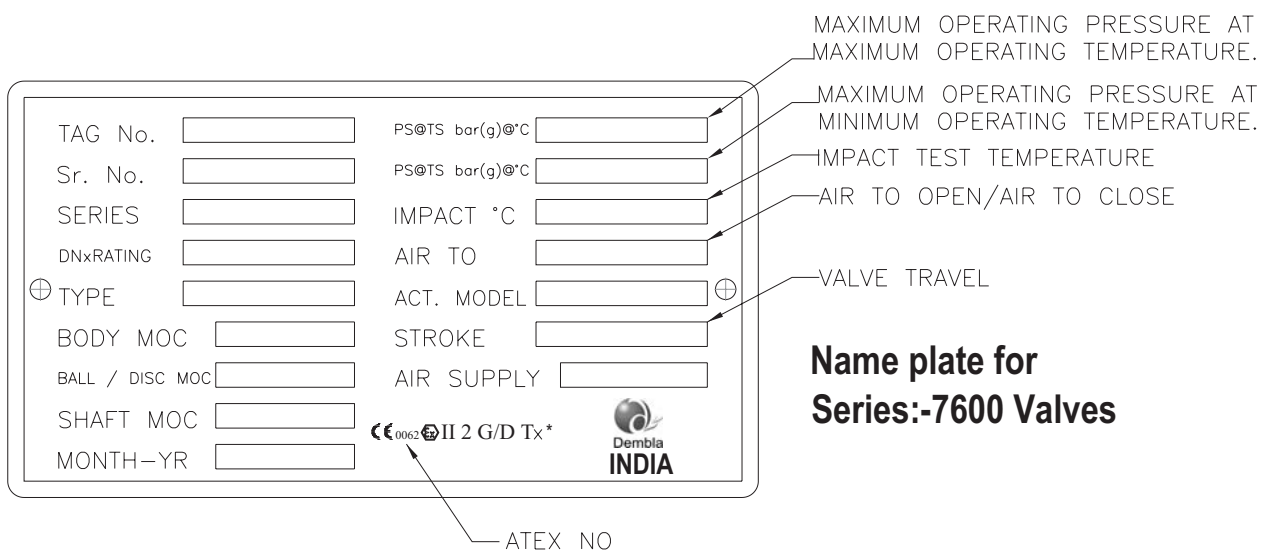
Valve should be stored in a clean and dry environment, without disturbing company setting. (e.g. Gland, Seat etc.) Protect it from shock & lifting damage.



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.





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.

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



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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).

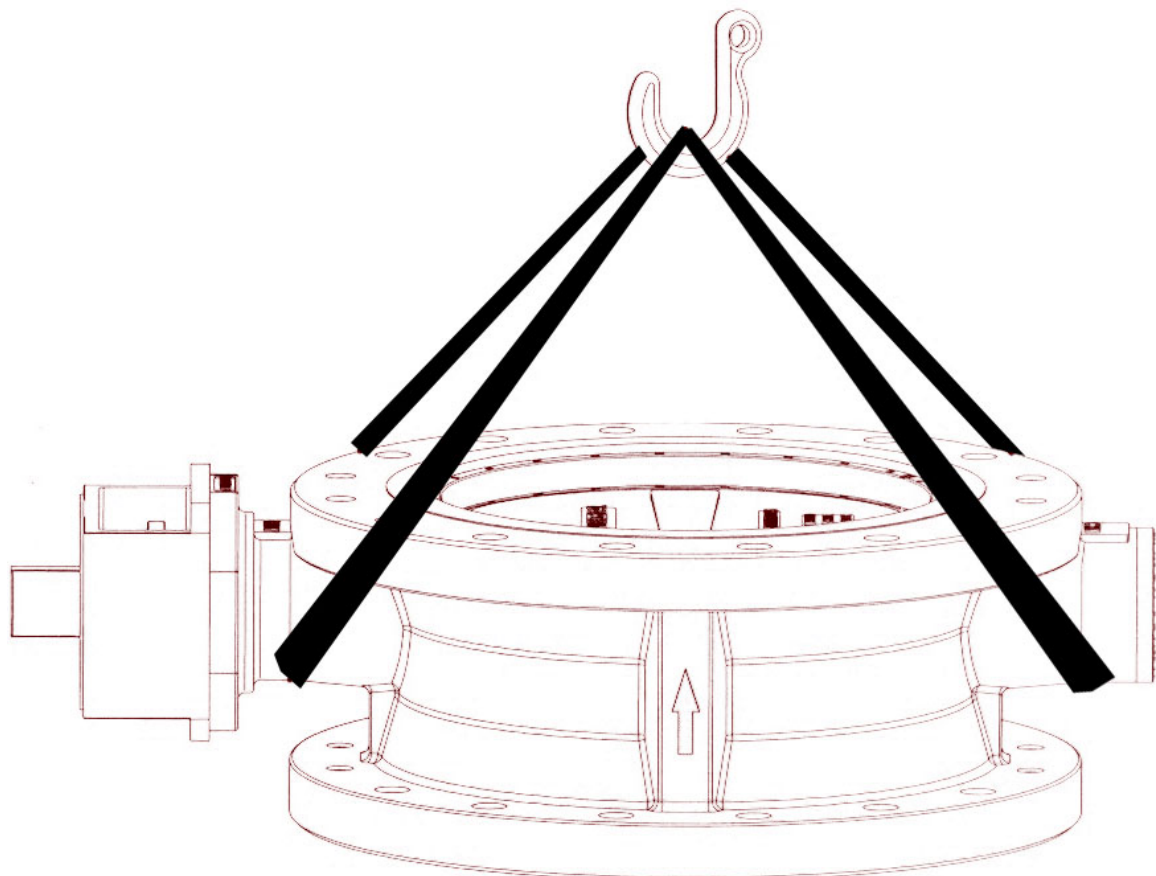


Fig .1

 **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.

 **Warning**

- 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.

7.2 Installation: -

- (1) Install the Valve using accepted piping practices.
- (2) Install the Valve according to flow direction marked on the Valve.
- (3) Use self centering Gasket.
- (4) Install the Control Valve preferably in a straight run of pipe away from bends or sections of abnormal velocity.
- (5) 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.
- (6) 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.
- (7) 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.
- (8) 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
- (9) Connect the Valve in pipe line with the standard connections.
- (10) Valve should not be installed vertically in pipeline.

7.3 Operation

Valve closes with clockwise rotation of the Valve Shaft. Valve is fully closed when disc is parallel to Seat Ring. The limit positions are set in the operators for extreme conditions i.e. open and closed.

7.4 Lubrication

The Valve Body set does not require any routine lubrication



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

Warning

Pipeline pressure must be released before the Valve is to be opened for maintenance of Gland Packing, other wise it may cause damage to the equipment / person's life.

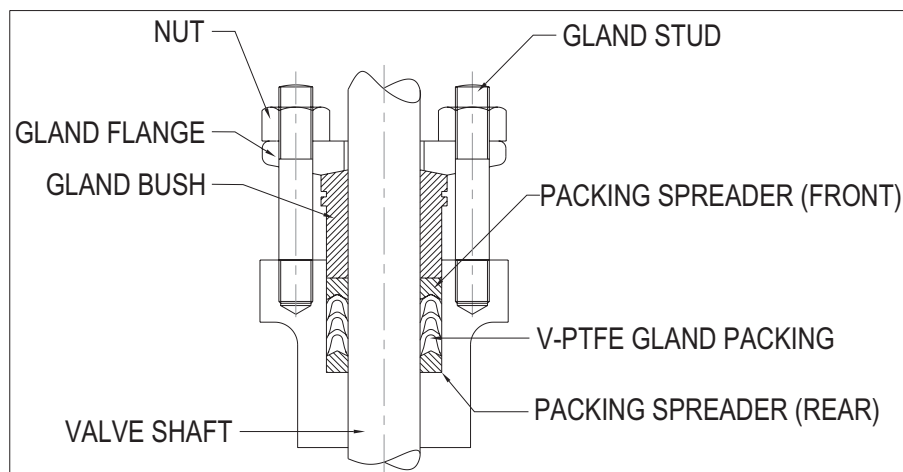
- (1) Separate out operator from the Valve Body.
- (2) Remove the operator bracket from the Valve.
- (3) Unscrew and remove nuts from Gland Stud.
- (4) Remove Gland Flange, Gland Bush & Packing Spreader.
- (5) Take out Gland Packing from the Stuffing Box.

Caution

Be careful while taking out Gland Bush, Gland Packing & Packing Spreader to avoid making scratches on the stuffing box wall.

- (6) Clean the Stuffing Box.
- (7) Follow the below procedure for the applicable Gland Packing option.

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.

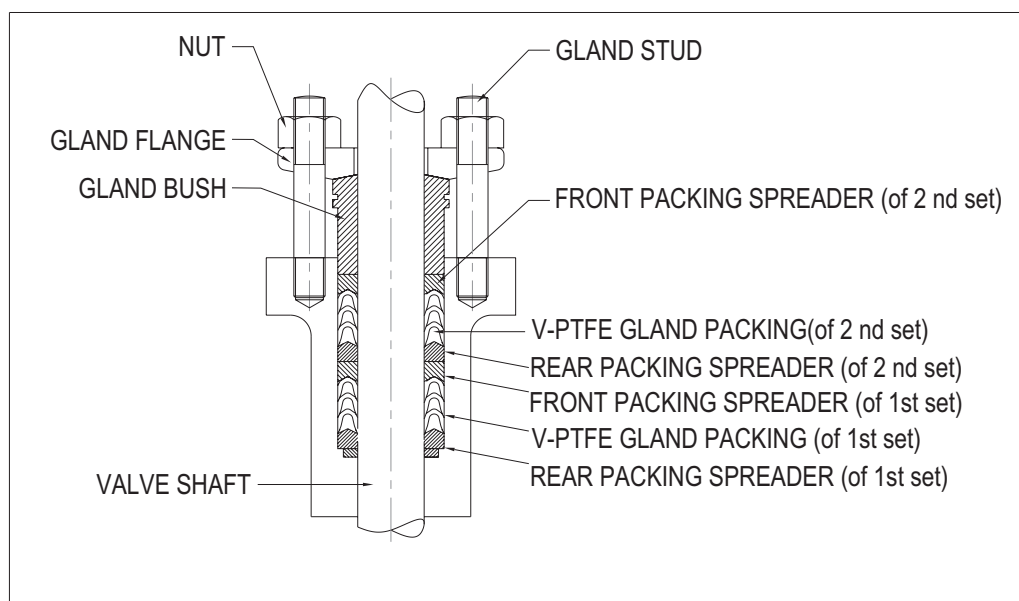
- (1) Place the V-PTFE Gland Packing set in the Body after 1 Rear Packing Spreader followed by Front Packing Spreader as shown in Fig. 9.1 Lubrication is not required.



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.

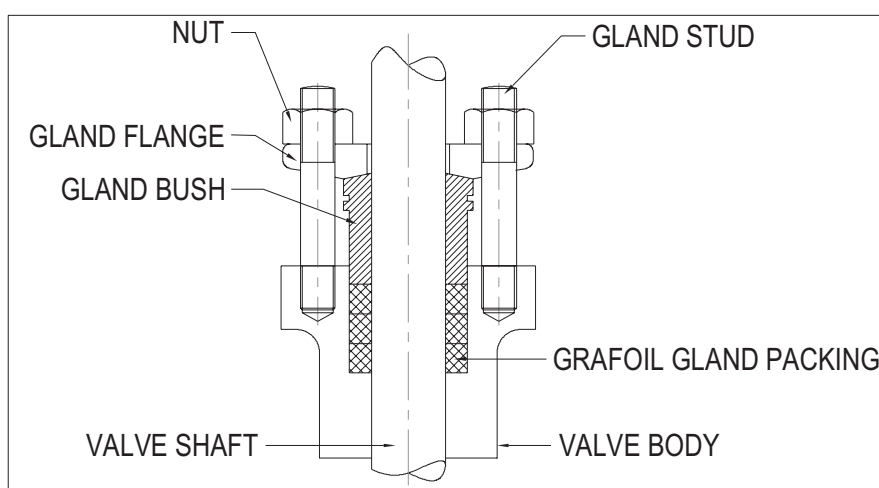
9.2 Double V-PTFE Packing



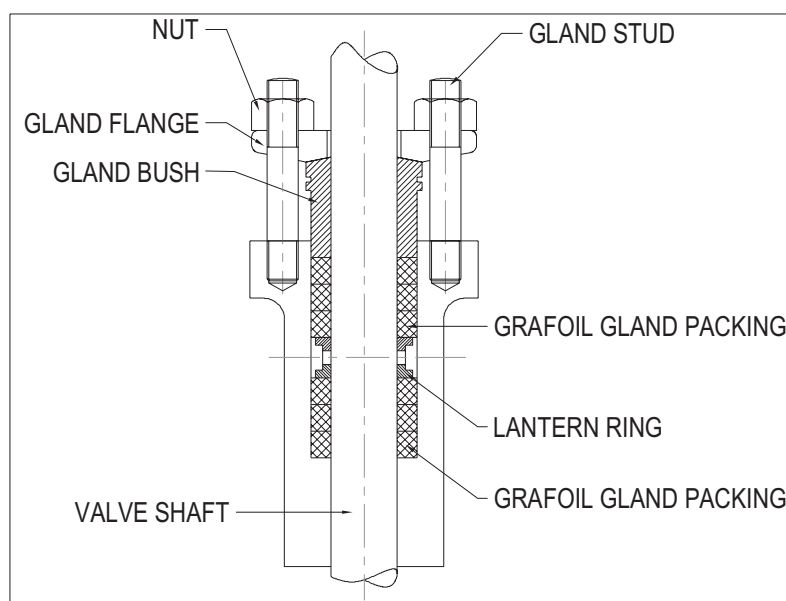
This Gland Packing consists of 1st set of Front and Rear Packing Spreader, 1st set of V-PTFE Gland Packing, 2nd set of Front and Rear Packing Spreader & 2nd set of V-PTFE Gland Packing.

- 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.

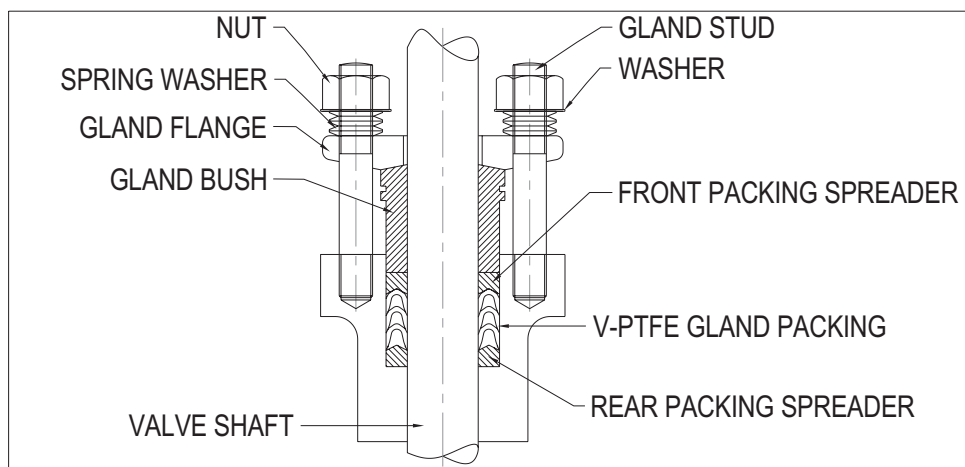
9.3 Grafoil Packing



9.4 Double Grafoil Packing



9.5 V-PTFE Low Fugitive Emission Packing



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

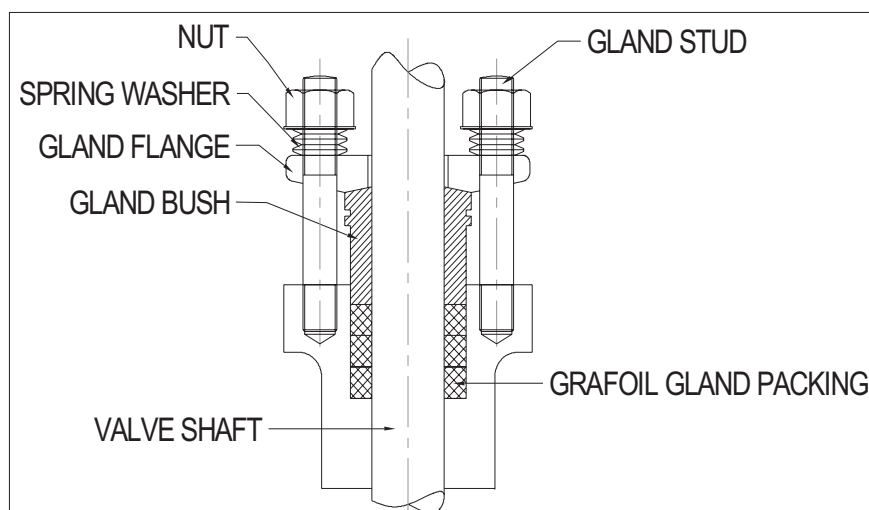
- (1) Place the V-PTFE Low Fugitive Emission Packing set in the Body after 1 Rear Packing Spreader followed by Front Packing Spreader as shown in Fig. 9.5 Lubrication is not required.

⚠ 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 Gland Flange on Gland Studs.
- (4) Insert Spring washer on Gland Studs.
- (5) Insert Washer on Gland Studs.
- (6) Insert and tighten Gland nuts. (refer 9.5)

9.6 Grafoil Low Fugitive Emission Packing





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10.0 Replacing Disc seal

Note

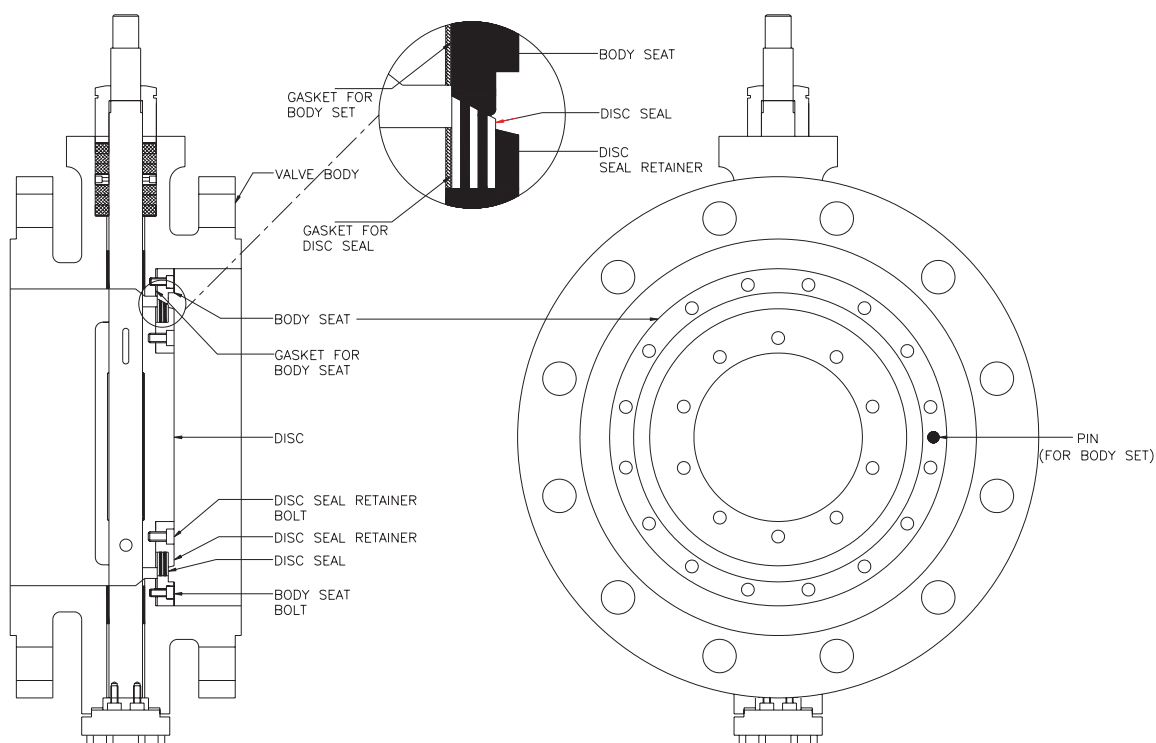
For maintenance or replacement of Disc seal, operator and bracket need not be dismantled.

10.1 Disassembly

- 1) Isolate the Control Valve from line pressure and release the pressure.
- 2) Remove the complete Valve from the pipe line.
- 3) Unscrew and remove Body Seat Bolts.
- 4) Remove Body Seat (Metal Seat) along with Gasket.
- 5) Unscrew & remove Seat Retainer Bolt.
- 6) Remove Seat Retainer.
- 7) Remove Disc Seal along with Gasket.
- 8) All part should be keep in clean & dry space.
- 9) Should not make scratch on any part(Cause Leakage.)
- 10) Replace Disc Seal with new one (From Dembla Valves Ltd.)
- 11) If required replace Body Seat with new one.(From Dembla Valve Ltd.)

10.2 Assembly

- 1) Insert Disc Seal Gasket in Disc.
- 2) Insert Disc Seal on it.
- 3) Insert Seat Retainer & Bolt it loosely (Disc Seal can rotate freely)
- 5) Insert Body Seat Gasket in Body with its position (Maintain pin position on Valve Body.)
- 5) Insert Body Seat in Body with its position and Bolt it.(Maintain pin position on Valve Body.)
- 6) Match Disc Seal contact with Body Seat properly.(If any problem contact Dembla scales.)
- 7) Tighten Seat Retainer Bolt which hold seal tightly.(Body Seat & Disc Seal should be in contact with high pressure)

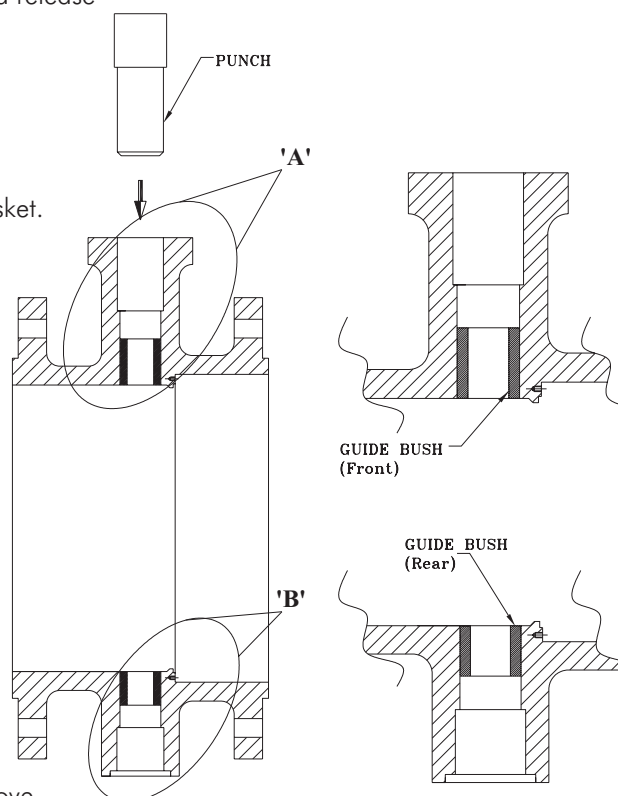




11.0 Replacing Guide Bush (Bearings)

11.1 Disassembly

- 1) Isolate the Control Valve from line pressure and release the pressure.
- 2) Remove the complete Valve from the pipe line.
- 3) Unscrew and remove Body Seat Bolts.
- 4) Remove Body Seat (Metal Seat) along with Gasket.
- 5) Unscrew & remove Seat Retainer Bolts.
- 6) Remove Seat Retainer.
- 7) Remove Disc Seal along with Gasket.
- 8) Loosen and remove Nuts from Gland Studs.
- 9) Remove Gland Flange.
- 10) Remove Gland Bush.
- 11) Remove the Locking Pin from the Disc by slight hammering.
- 12) Hold disc properly & pull Shaft from Front.
(Front Shaft if it's two piece designs)
- 13) Loosen & remove Bottom Cover Nuts and remove Bottom Cover along with its Gasket.
- 14) Remove the Rear Shaft (If Shaft two piece design)
- 15) Remove Disc from Valve Body.
- 16) Remove Gland Packing and Packing Spreader.
- 17) Keep all parts in clean & dry pace. (Scratch on any part may cause leak.)
- 16) Now slowly remove the Guide Bush by slightly hammering
By a pusher tool avoiding scratches in the Valve Body.
- 17) Replace Guide Bush & all Gasket with new one.



11.2 Assembly

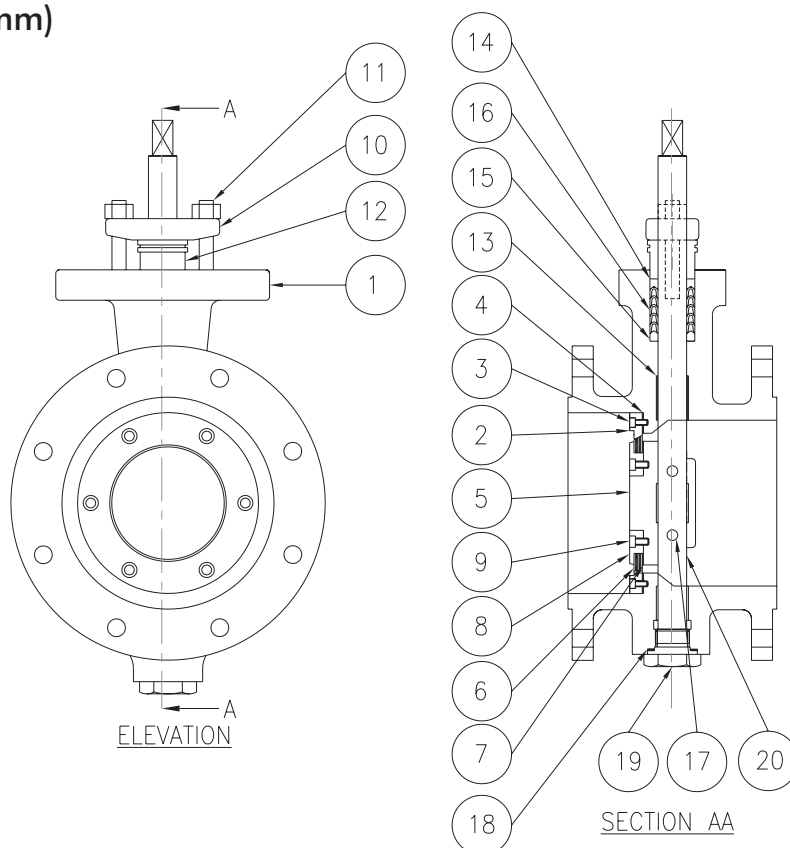
- 18) Hold Disc and insert in Valve Body.(To maintaining its position for Valve Shaft.)
- 19) Insert Valve Shafts in Valve Body (Front & Rear Shaft)
- 20) Insert Bottom Cover in Valve Body & Bolt it along with new Gasket.
- 21) Insert Lower Spreader , Gland Packing, Upper Spreader & Gland Bush in Valve Body from Front Shaft end.
- 22) Insert Gland Flange and Bolt it properly(Refer 13.0 Torque for Studs.)
- 23) Insert Disc Seal Gasket in Disc.
- 24) Insert Disc Seal on it.
- 25) Insert Seat Retainer & Bolt it loosely (Disc Seal can rotate freely)
- 26) Insert Body Seat Gasket in Body with its position (Maintain pin position on Valve Body.)
- 27) Insert Body seat in Body with its position and bolt it.(Maintain pin position on Valve Body.)
- 28) Match Disc Seal contact with Body Seat properly.(If any problem contact Dembla Sales Office.)
- 29) Tighten Seat Retainer bolt which hold seal tightly.(Body Seat & Disc Seal should be in contact with high pressure)

12.0 Trouble Shooting

No.	Condition	Possible Cause	Remedy
1	Gland Leakage	Gland Nut loose	Adjust Gland Nut
		Worn out Packing	Replace Gland Packing
2	Seat Leakage	Sealing edge of seat damaged	Replace soft seat
		Valve pressurized to high +pressure	Reduce line pressure to rated pressure
		Fluid is abrasive and eroding away the components	Replace the worn out component of valve with material suitable for abrasive media
3	Valve does not open / close fully	Foreign object got stuck up between plug and seat	Open the valve and clean the line / valve to remove foreign object
		Disc to shaft connection failed	Replace disc pins and/or shaft
4	Opening / Closing thrust excessive	Excessive dirt accumulated at the components	Clean the components
		Shaft , bearings or seat worn out	Replace the worn out components

13.0 Parts Illustrated

13.1 Butterfly Valve Assembly Double Flanged Type: - SIZE 3" (80mm) TO 6" (150mm)

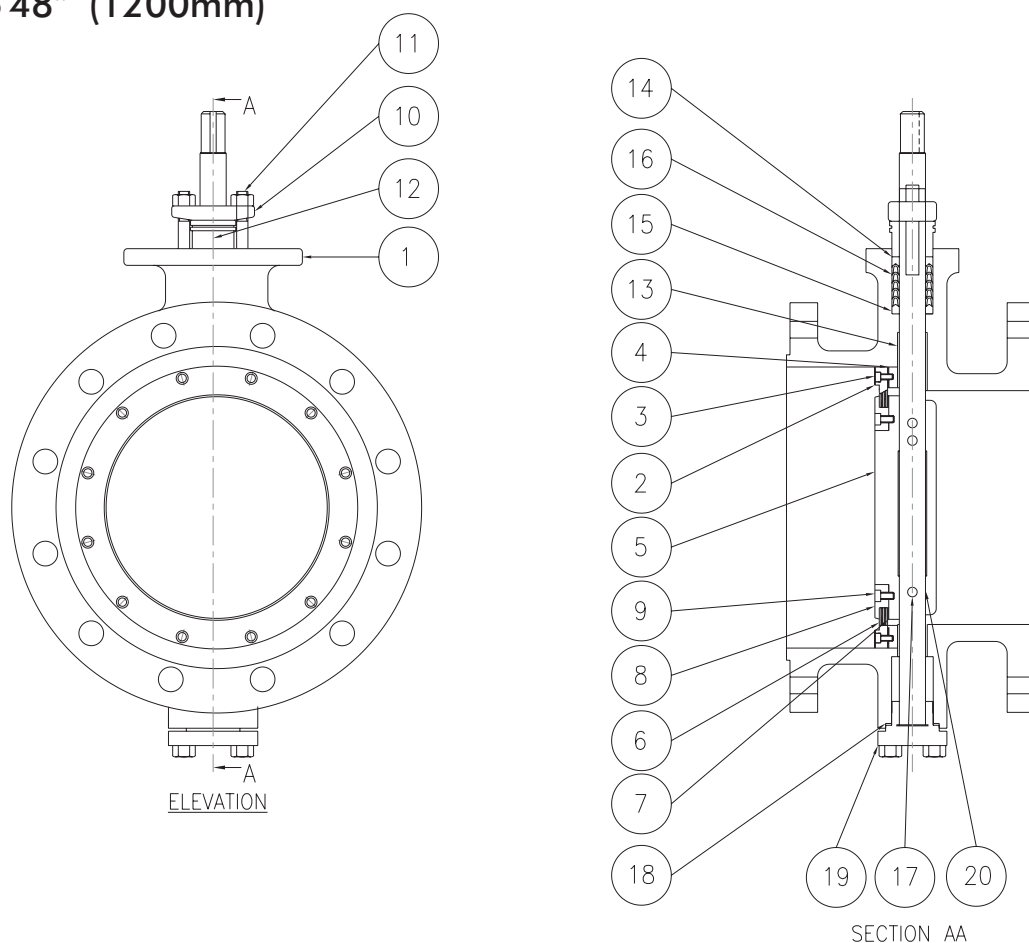


No.	Part	Qty.
1	Body	1
2	Body Seat	1
3	Body Seat Bolt	1 set
4	Body Seat gasket	1
5	Disc	1
6	Disc Seal	1
7	Disc Seal Gasket	1
8	Seal Retainer	1
9	Seal Retainer Bolt	1 Set
10	Gland Flange	1
11	Gland Stud/Nut	2
12	Gland Bush	1
13	Guide Bush (Bearing)	1 Set
14	Packing Spreader -Front	1
15	Packing Spreader - Rear	1
16	Gland Packing	1 set
17	Disc Locking Pin	2
18	Gasket - Body to Bottom Cover	1
19	End Cover	1
20	Valve Shaft	1



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13.2 Butterfly Valve Assembly Double Flanged Type: - SIZE 8" (200mm) To 48" (1200mm)



No.	Part	Qty.
1	Body	1
2	Body Seat	1
3	Body Seat Bolt	1 set
4	Body Seat gasket	1
5	Disc	1
6	Disc Seal	1
7	Disc Seal Gasket	1
8	Seal Retainer	1
9	Seal Retainer Bolt	1 Set
10	Gland Flange	1
11	Gland Stud/Nut	2
12	Gland Bush	1
13	Guide Bush (Bearing)	1 Set
14	Packing Spreader -Front	1
15	Packing Spreader - Rear	1
16	Gland Packing	1 set
17	Disc Locking Pin	2
18	Gasket - Body to Bottom Cover	1
19	End Cover	1
20	Valve Shaft	1



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14.0 Torque For Studs

Studs	Torque Nm
M 8	11
M 10	27
M 12	38
M 14	61
M 16	96
M 20	185
M 22	256
M 24	332
M 30	678
M 36	1085

15.0 Recommended Spare Parts

It is recommended to stock following Spare Parts for commissioning and routine service:

Part No	Part Name	Recommended Quantity
2	Body seat	One for every Five identical or One minimum.
4	Body seal Gasket	One for every Five identical or One minimum.
6	Disc Seal	One for every Five identical or One minimum.
7	Disc seal Gasket	One for every Five identical or One minimum.
13	Guide bush	One set for every Five identical or One set minimum. (front & rear)
16	Gland Packing	One Set for every Two identical or One Set minimum.
18	Gasket Body bottom cover	One for every Five identical or One minimum.

Note

While Ordering Spares, Please do not miss to indicate 'Valve Serial No.' appearing on Nameplate provided on the operator Yoke or on Valve Body Flange. The Valve Serial No. begins with alphabet 'V' followed by numbers, for e.g. V-12345 .

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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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Sales Office:

M/S. Dembla Valves Ltd.
C-30, Jai Matadi Compound, Kalher
Village, Thane-Bhiwandi-Agra Raod -
421302,
Maharashtra, India.
Tel - +91-9292234790 - 97
E-mail - expo@dembla.com
More info - www.dembla.com

Works:

M/S. Dembla Valves Ltd.
A/8, Arahm Logistic, Valshind Village,
Mumbai -Nashik Highway
(NH3), Bhiwandi
Thane - 421302. Maharashtra (India)

