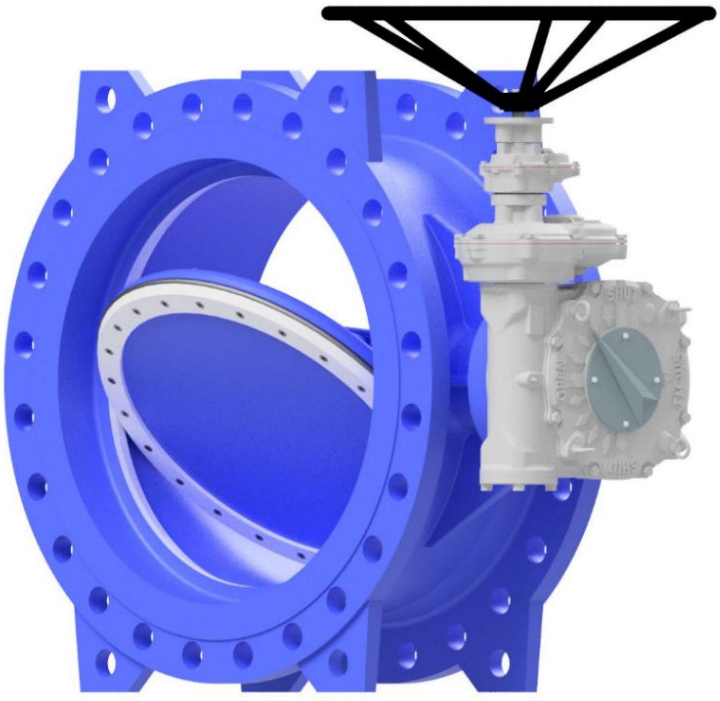
DVD VALVES

OPERATION MANUAL

KVN BUTTERFLY VALVE



GENERAL SAFETY INSTRUCTIONS

This Operation Manual is created for you to use DVD Butterfly Valves effectively and to reduce potential risks regarding faulty use of the mentioned valves. With this Manual, potential accidents and damages can be prevented and life time of the valve can be increased.

The product you will be using is designed and manufactured according to highest quality standards and has passed DVD quality procedures 100%. However, Valves hold potential risks and can cause danger in case of faulty use or faulty assembly. Therefore, **everyone, who somehow gets in contact with the valve, is responsible for reading and fully understanding this Operation Manual.**

Unauthorized revision, change or application on the product or any of its parts shall be prevented at all times. In case of incompliance to this Operation Manual, DVD Valves cannot be hold directly or indirectly responsible or liable.

During the use of the Valves, general regulations and standards shall be followed. Some of these regulations are defined in EN Standards. Installation of the Valves shall be done by qualified and experienced technical personnel. For detailed information regarding the Valves, DVD Documentation (Catalogs, if appropriate Special Specifications and Technical Drawings, related DVD Order Confirmation etc.) shall be used and followed.

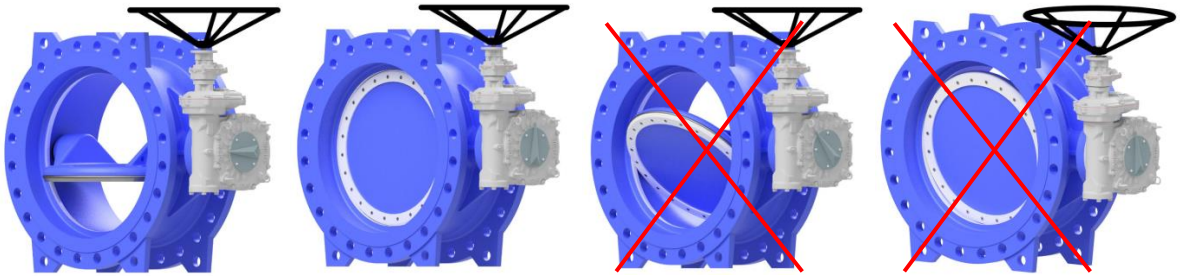
Before disassembling the Valve from the pipeline or any of its parts from the valve, make sure that the pipeline is de-pressurized and necessary safety cautions are taken. **If the line (water or air) is pressurized, any part of the Valve can move unintentionally, without any control.**

After commissioning, consequently the Valves are working under pressure; the Valves shall be monitored at all times and should be inspected regularly. Furthermore; laws, regulations and standards about Occupational Health and Safety should be taken into consideration.

If the Valve is installed as a drainage valve, operation of the valve shall be done with extreme caution. In such an installation, any movement can result in pressurized water discharge. Moreover, since the Valve disc mechanism is reachable, precaution must be taken for trapping or squeezing.

During dismantling of the Valve from the pipeline, medium can flow out from the pipe or the valve in a fast and uncontrolled way. Before dismantling, the pipeline must be emptied to prevent such an incident. Along with the medium; foreign objects (stone, sand, debris etc.) can be flowing out that can cause damage to personnel. Necessary precautions shall be taken to prevent such damage.

DVD Butterfly Valves are designed to be installed on pipelines as Isolation Valves (On-Off). **DVD Butterfly Valves should not be used for Regulation purposes.** Regulation purpose use can cause permanent damage to the Valve. Regulation purpose means to operate the Valve in any other position of the Valve Disc than fully open or fully close positions.



Fully Open Disc Position | Fully Closed Disc Position | Regulation Disc Positions

PICTURE 1: Butterfly Valve Disc Positions

Operating limits such as Nominal Size, Pressure, Temperature of the Valve can be found in DVD Documentation. Furthermore; Operating Size, Operating Pressure, Valve Body Material and Production Date can be found on the marking of the Valve Body. Any operating condition that is incompliant with these operating limits shall be approved by the Manufacturer in written. Pipeline Operating Pressure can be fluctuating (due to surge, water hammer, air regulation problems etc.). Therefore, such fluctuations should be considered, and the Valve should never be faced with a higher pressure than the defined Nominal Pressure.

Valves should be projected from frosting at all times. Especially in locations that have high risk, protective measures should be taken such as; burying of pipelines in more depth, protecting the valve chambers by isolation material, or fully draining of pipelines before freezing conditions occur. If no precaution is taken, due to expansion of water, Valve body or other parts of the Valve can be permanently damaged. DVD Valves cannot be held liable from such damages.

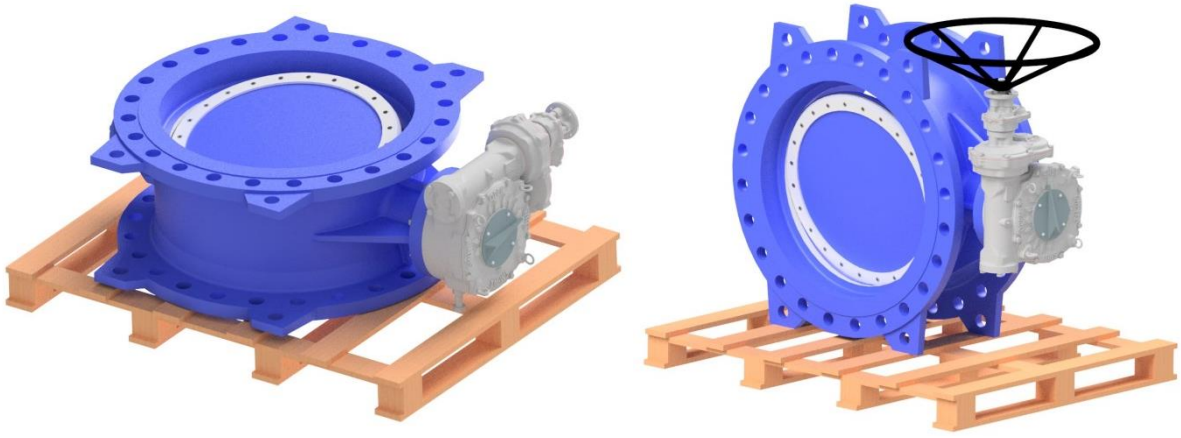
TRANSPORTATION AND STORAGE

During transportation and storage, Valves shall be packed with material that can withstand to its size and weight, and should be fully fixed on a pallet. If the Valves are not fully fixed on the pallet, the Valve can move during transportation and can cause severe damage. The Valve should be protected from environmental conditions and physical impacts from outside. Any part of the Valve body should not exceed the pallet dimension and shall be wrapped by protective cover (stretch film, insulation material etc).

Valve coating and Valve accessories shall be protected at all times during transportation and assembly.

Positioning of the Valve on the pallet is done in two ways:

1. Transportation and Storage Purpose: Valve is positioned on its inlet flange (preferred)
2. Only Storage Purpose: Valve is positioned on its feet, gearbox handwheel facing top (not preferred – center of gravity of the valve will be higher and this can cause the valve to fall, in case of earthquakes or outside impacts)



Transportation &
Storage Purpose

Only Storage Purpose
(Not Preferred)

PICTURE 2: Positioning the Valve on the Pallet

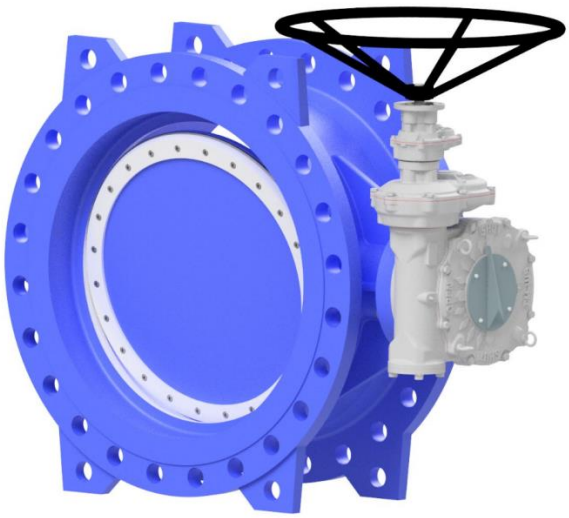
Center of Gravity of the Valve can be away from the Valve Center. Therefore, during lifting the Valve, it can swing around. Such incidents can cause damage on the lifting device, the Valve itself, and to personnel around the Valve. **Lifting operation should be done with extreme care and Center of Gravity of the Valve should be determined before lifting operation.**

If the Valve has any accessories such as Electric, Hydraulic, Pneumatic Actuator or Lever & Counterweight; be cautious about the extra weight of these devices and their effect on the center of gravity. These devices can cause the Valve to tilt down, especially at smaller sizes. Therefore, during storage, bottom of the gearbox shall be reinforced by durable material to prevent tilting of the valve.

Lifting Belts and Lugs which are according to safety norms shall be used. They have to be suitable for the Valve weight. Valve should be lifted only from the Lifting Bores. **Lifting from the Gearbox or the Actuator should not be done at all times. Likewise, Valve Disc should not be used as a Lifting Point.** These parts are not designed to carry the weight of the Valve and lifting from these parts can cause breaking, tumbling or dropping.

During Storage and Transportation, Valves should never be faced with direct sunlight. Under direct sunlight; seals or valve coating can get damaged. Valves should be protected and stored in a dry and aerated environment and should be protected from environmental effects. Storage should be done @ -20°C/+50°C temperature range. If the temperature is below 0°C, before assembling the Valve; the Valve should be heated up to 5°C.

DVD Butterfly Valves should be transported and stored with a disc position of 10 degrees opening. Otherwise, sealing can get damaged.



PICTURE 3 – Transportation and Storage Disc Position: 10 Degrees Opening

Valves should never be in direct contact with the ground, and should be protected by a pallet. Valve internal surface and moving parts should be protected from foreign particles, sand, dirt, debris etc. Debris collected on moving parts can cause these parts to get stuck and prevent valve operation. Flange Protection Covers should only be dismantled right before assembly to the pipeline.

USE AND APPLICATON

DVD KVN Butterfly Valves in standard configuration are designed to be used in clean potable water systems. Operation in medium containing gas, oil etc. is only possible with written manufacturer approval and with special material selections suitable to the medium.

In systems that contain foreign particles (dirt, sand, debris etc.), the Valve can be clogged or sealing problems can occur. Butterfly Valves should not be used in such applications. If the particle level is very low, Strainers should be used in the upstream of the Butterfly Valves. For special applications other than clean water systems, please get in contact with the manufacturer and request a written approval.

DVD Butterfly Valves are designed as Isolation Valves (On-Off) and cavitation damage can occur in case of regulation (semi valve disc opening). If vibration or noise occurs during the operation of the Valve, please check whether the Valve is either in fully open or fully closed position. If the disc position is ok but the problem still continues, please check the system operation conditions (flow rate, pressure etc.) in order not to face any cavitation damage.

High Water Velocity can cause damage to the Valve. To prevent such damage, please check the Water Velocity. Maximum operating velocity for DVD Butterfly Valves is as follows:

Nominal Pressure	Max Water Velocity
10 bar	3 m/s
16 bar	4 m/s
25 bar	5 m/s
40 bar	6 m/s

DVD Butterfly Valve disc opening and closing limits are set at the Gearbox. These limits are factory-set and should not be changed with the permission of the manufacturer. These limits can be sensed easily by opening/closing the valve. **Do not force the Valve to further opening or closing beyond the Valve Disc Limit.** Such force does not increase the sealing capability of the valve; on the contrary, due to excessive torque, damages can occur on the Valve. If there is a sealing problem, please get in contact with the manufacturer before applying excessive torque.

DVD Butterfly Valves are provided with a Worm Gearbox Handwheel for manual applications; and with Actuator Handwheel for automation applications. Handwheels are designed to operate the Valve easily and can provide sufficient force on the Valve. **For any reason, do not use a bigger Handwheel or do not use a device (crank, lever etc.) to increase the force acting on the Valve.** If there is a torque problem, please get in contact with the manufacturer.

INSTALLATION TO THE PIPELINE

Pipeline flanges, which the valve will be installed to should be in the same axis and flange surfaces should be parallel to each other. Sealing problems can be seen if this is not obtained, and/or the Valve can face high load forces that can cause failures in long time. Load forces transmitted to the Valve from the pipeline should not go beyond what is defined in EN 1074-2 standard. Not to do so can cause Valve failure.

For Valve installation, enough distance should be provided between two connecting pipeline flanges. Shorter distance than needed can damage the Valve flange or the Valve coating. If there is longer distance than needed, do not try to pull the pipeline flanges and Valve flanges towards each other. During installation, make sure that flange surfaces are clean and smooth.

Valve flange to pipeline flange connection should be done by bolts and nuts; and washers must be used to protect the Valve coating. Opposing bolts should be screwed equally, preventing high load forces, strain and failure. Steel reinforced gaskets should be used between the flanges. Make sure that the gaskets are correctly positioned on the sealing surface of the flanges. Flange bolting should be selected according to EN 1591 Standard requirements. Excessive screwing of the bolts can cause permanent damage on the Valve.

Valve should be protected from outside effects (construction work, coating, concrete work etc.) at all times. Welding work should be concluded before Valve installation, and welding burrs should be cleaned beforehand.

Pipeline should be flushed and cleaned from all foreign particles, before Valve installation. Even though the pipeline can seem to be clean around the Valve installation area, during filling the line, particles from long distances can be carried to the installation area and can cause permanent damage on the Valve. DVD Valves cannot be held liable from damages occurred due to foreign particles such as debris, dirt, stones, wooden sticks etc.

Especially at steel pipeline applications, make sure to have full cathodic protection. In the absence of cathodic protection or non-active protection, Galvanic Corrosion can occur very fast. DVD Valves cannot be held liable from such damages.

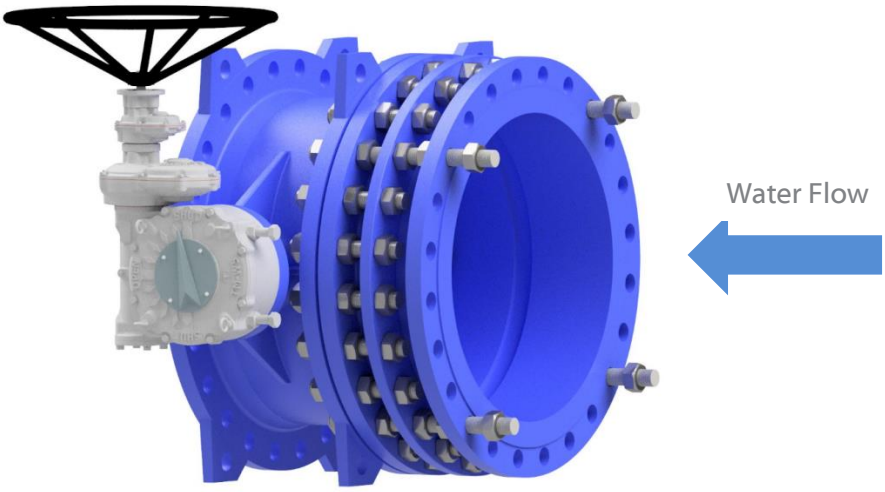
Inspect the Valve before installation and make sure that there are no foreign particles inside the Valve. Check the sealing surfaces of the Valve and confirm that they are clean. Open and close the Valve at least one time and check the functionality of the Valve before installation. For Valves that are stored for a long period of time, please check the sealing gasket for any deformation and please contact the manufacturer if you see any problems.

If the Valve needs to be re-coated on site, for maintenance purposes, be sure to protect the sealing surfaces (gaskets, o-rings, stainless steel surfaces etc.) If these surfaces are coated, sealing problems can occur.

VALVE POSITIONING

If the Valve is to be installed underground, installation inside a Valve Chamber is highly recommended. If the Valve is to be buried, additional Gearbox protection is needed. Therefore, please inform the manufacturer for such an application, on the order.

During installation, take into consideration possible inspection and maintenance circumstances and provide enough space for such intervention. Quick Couplings such as Dismantling Pieces should be used together with the Valve for ease of dismantling the Valve. Dismantling Pieces are recommended to be installed in the upstream of the Valve. Furthermore, a Lifting Device should be available on the site that is in line with the weight of the Valve. Otherwise, dismantling and re-installing of the Valve for maintenance purposes will not be possible.



PICTURE 4 – Butterfly Valve + Dismantling Piece Connection

It is recommended to have DN x 3 straight pipeline installation in the upstream and downstream of the Valve. Equipment such as Elbow, T-Connection, Strainer etc. to be installed directly in the upstream of the Valve can cause cavitation and can damage the Valve.

Butterfly Valve Disc rotation can go beyond the Valve Body; and Disc may need more space than the Body. Therefore, if there is a restriction for not installing a straight pipeline in

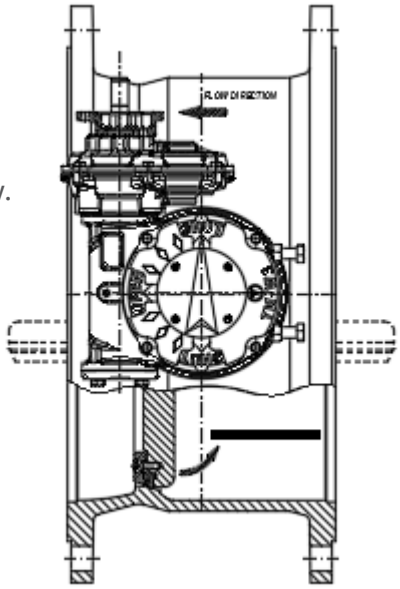
the upstream and downstream of the Valve; make sure that equipment around the Valve is not preventing the Valve Disc Rotation.

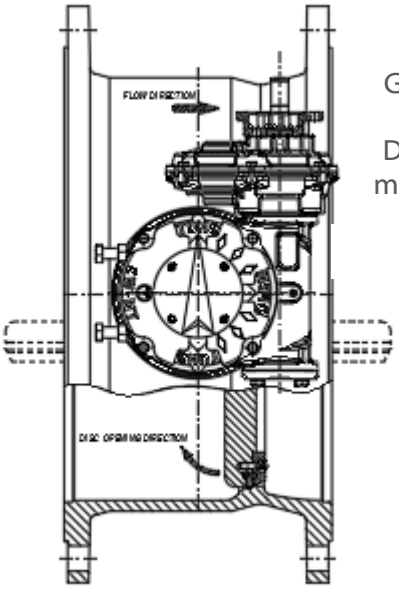
If the Butterfly Valve is to be installed in the downstream of a Regulating Valve (Hydraulic Control Valve, Plunger Valve etc.) or a Pump, make sure to leave at least DN x 10 gap. Cavitation risk is higher for Regulating Valves and Pumps compared to stationary equipment.

DVD KVN Butterfly Valves is provided with four different configurations. These configurations are as follows:

Configuration A
Gearbox on the left of water flow direction.
Disc downside opening movement towards flow.

STANDARD



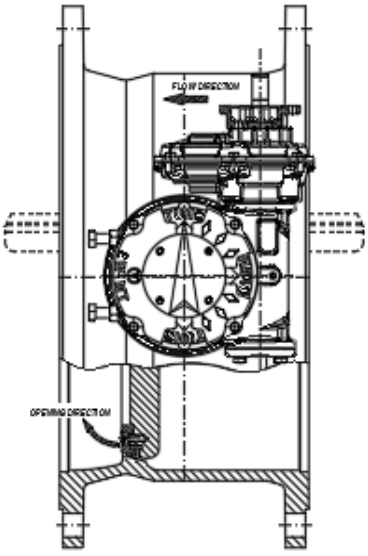


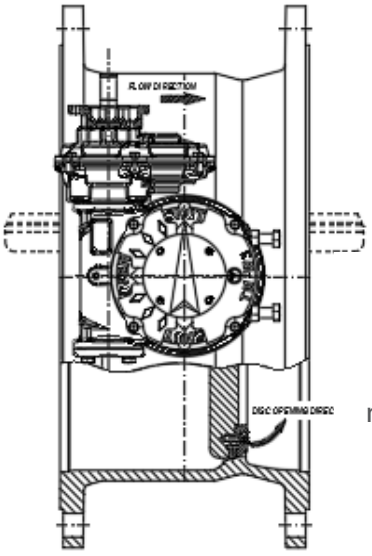
Configuration B
Gearbox on the right of water flow direction.
Disc downside opening movement towards flow.

OPTIONAL

OPTIONAL

Configuration C
Gearbox on the left of water flow direction.
Disc downside opening movement with the flow.





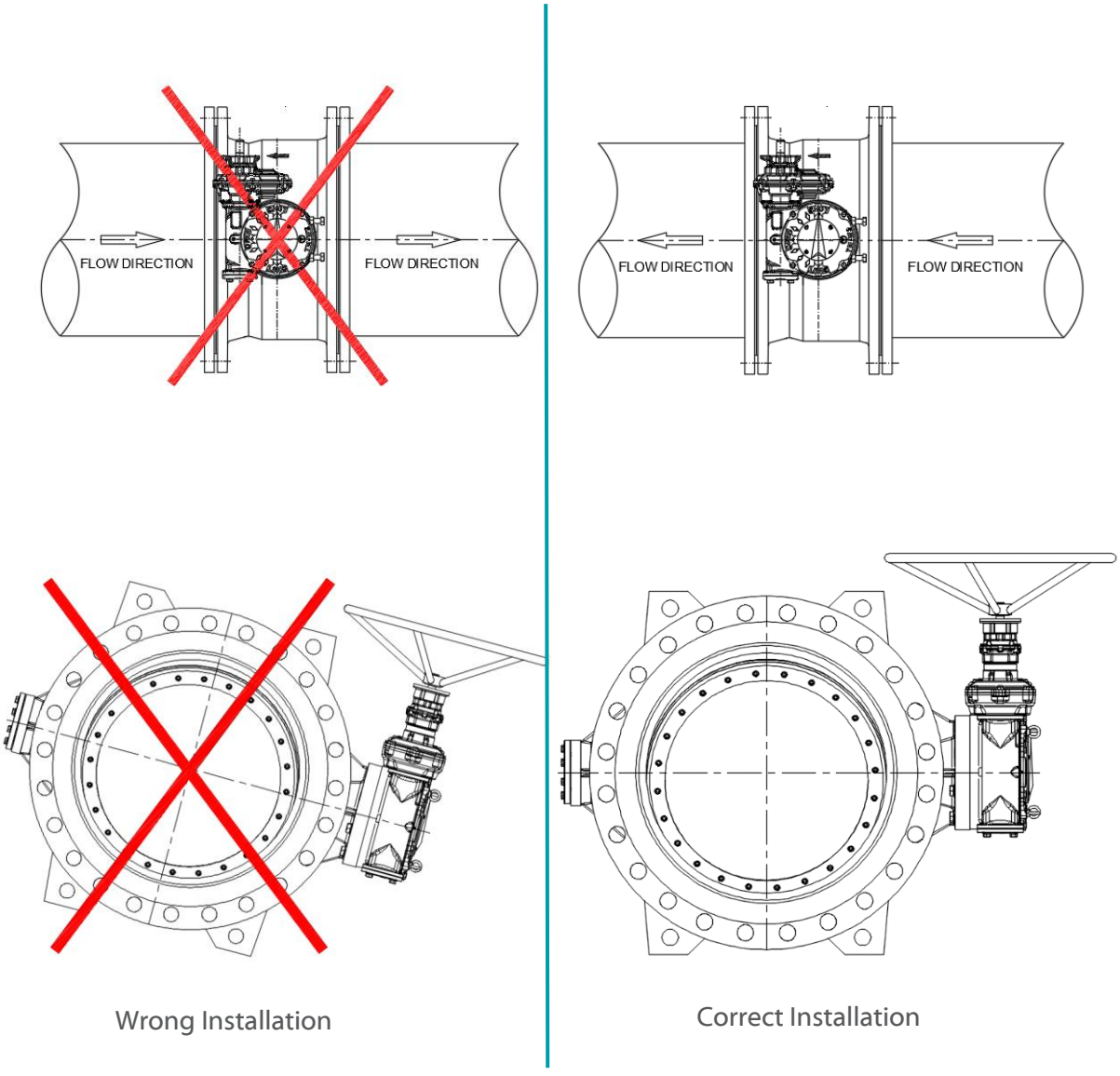
OPTIONAL

Configuration D
Gearbox on the right of water flow direction.
Disc downside opening movement with the flow.

PICTURE 5 –DVD Butterfly Valve Configurations

In case nothing is mentioned with the Order, DVD factory set Configuration is "Configuration A". Configuration B, C and D are optional configurations, and such demands should be mentioned in the order, and written approval should be received from the manufacturer.

If installation on site is not possible due to Gearbox position of the Valve, do not install the Valve upside-down or do not tilt the Valve. In such a problem, please contact the manufacturer immediately and request a Configuration Change. Installing the Valve upside-down or as tilted can cause sealing problems or cause permanent damage on the Valve.

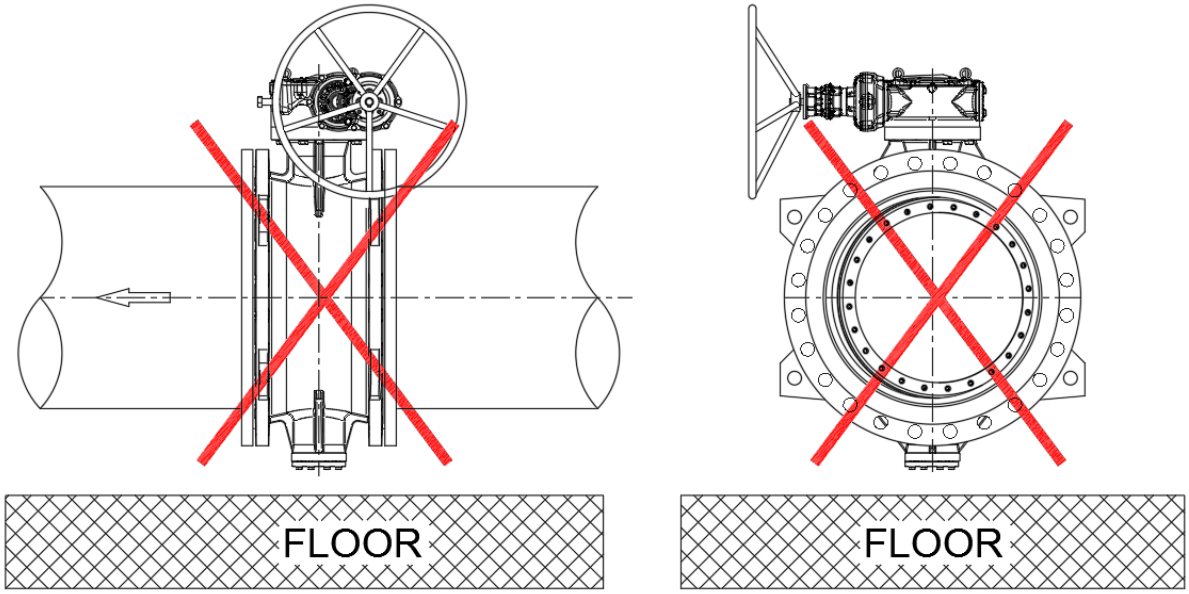


Wrong Installation

Correct Installation

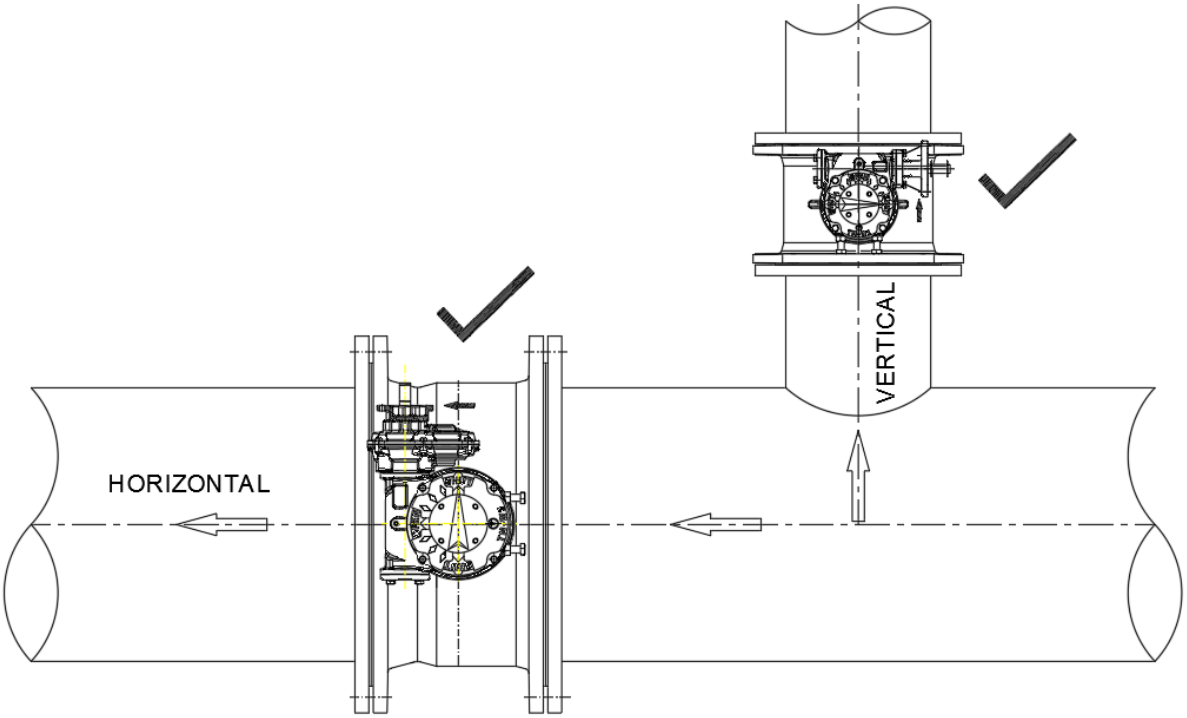
PICTURE 6 – Installation – Valve should not be installed upside-down or as tilted.

DVD KVN Butterfly Valves cannot be installed with the Gearbox positioned at the top of the Valve. Such installation can cause sealing problems or cause permanent damage on the Valve. Such an installation positioning should be mentioned in the Order.



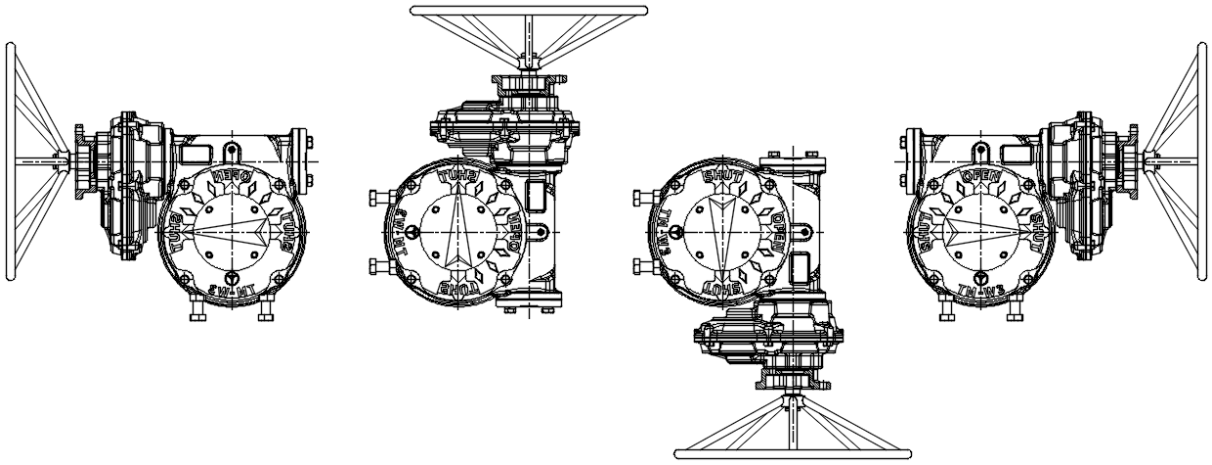
PICTURE 7 – Wrong Installation – Gearbox at the Top of the Valve

Valve can be installed to vertical and horizontal pipelines, meeting the constraints mentioned above.



PICTURE 8 – Correct Installation of Butterfly Valves to Horizontal and Vertical Pipelines

Gearbox on the Valve can be rotated on the shaft in 90 degree intervals. With such rotation, Gearbox Handwheel can be arranged to face top, bottom, water flow direction and opposite water flow direction. If handwheel position is not mentioned on the order, the handwheel is facing top.



ŞEKİL 9 – Gearbox Positioning on the Valve

DVD KVN Butterfly Valves are manufactured and tested to have bi-directional sealing. However, it is recommended to install the Valve according to the Water Flow Arrow indication. Installing the Valve opposite to the Arrow indication can cause the life time of the Valve to decrease.

GENERAL INFORMATION REGARDING ACTUATORS

This section is related to DVD KVN Butterfly Valves with Actuator. For Manual Butterfly Valves, please move on to the next section.

For more information, please check the Operation Manual of the Actuator Manufacturer and follow its requirements. If Actuator Brand and Model is unknown, please get in contact with DVD Valves.

DVD Butterfly Valves are shipped from the factory as Actuators set and tested. Therefore, do not change Actuator Settings and Limits. Such a change can cause excessive force to be applied on the Gearbox and can wear it. If you feel that there is a problem with the settings, please contact DVD Valves and get a written approval for change of setting on site.

DVD KVN Manual Butterfly Valves are provided with Top Flange ready for Actuator assembly. If an Actuator installation is to be done on an existing Manual Butterfly Valve, please contact with DVD Valves and receive a written approval for such an installation.

For Actuator adaptation, correct Actuator type and model has to be selected. Wrong selection can cause problems regarding with assembly, or can cause permanent Valve damage. **DVD**

Valves cannot be held liable for damages due to unapproved actuator selection and installation.

After Actuator installation, Open – Close Limit Settings and Torque Limit Settings should be done. Not to do so can cause excessive force on the Gearbox and can cause permanent damage on the Valve. Please check the Operation Manual of the Actuator Manufacturer for the Settings. DVD Valves cannot be held liable for damages due to not doing the setting, or wrong setting of the Actuator.

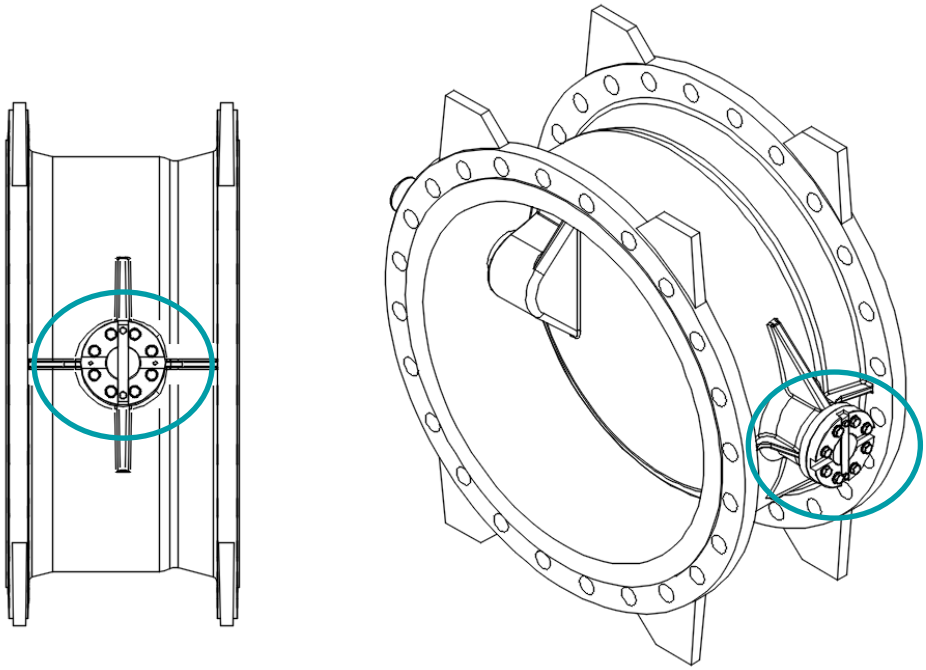
MAINTANANCE

Before starting the maintenance, make sure that the Valve is isolated; upstream and downstream pipelines of the Valve are drained and de-pressurized. In case pipeline is not de-pressurized fully; potential dangers such as sudden disc movement, part movement or pressurized water outflow etc. can occur.

After maintenance is done, please re-install the Valve to the pipeline according to the related section in this Operation Manual.

Standard DVD KVN Butterfly Valves do not have a Disc Locking Mechanism. If such a feature is not defined in the order and if a written approval is not received from the manufacturer, **Gearbox cannot be dismantled from the Valve, while the pipeline is pressurized.**

For any reason, if the Gearbox is dismantled from the Valve, the Valve Disc can rotate suddenly with the line pressure and cause slamming in the pipeline. Furthermore, it can cause permanent damage on the Valve itself. Likewise, even though the Gearbox is dismantled after removing the Valve from the pipeline, Valve Disc can rotate due to its gravity. Necessary precautions should be taken for such incidents before Gearbox dismantling. These precautions should include bringing the Valve Disc to fully closed position before the dismantling process.



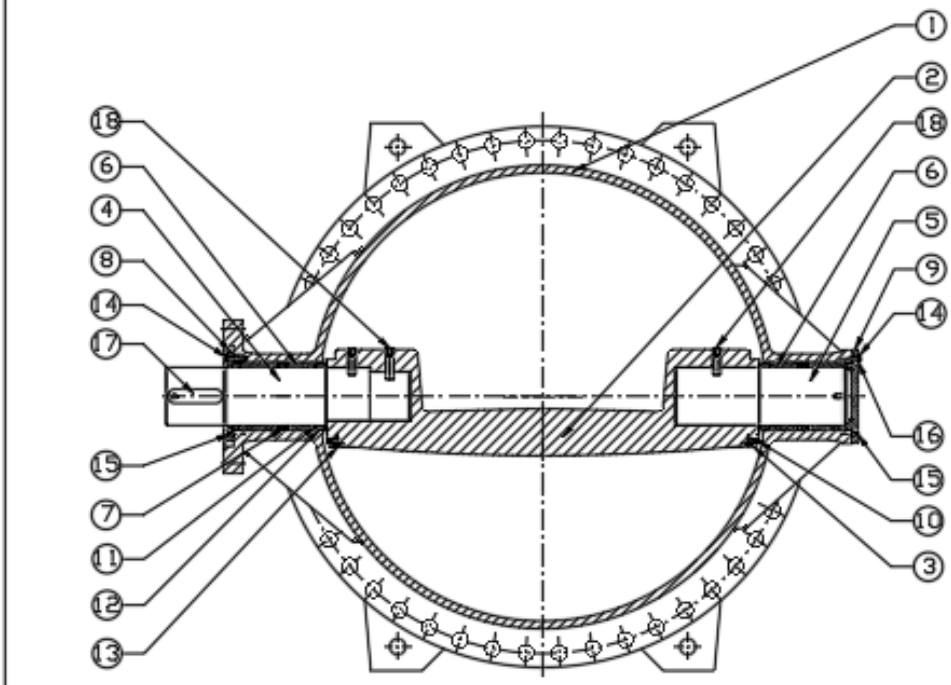
PICTURE 10 – Optional Disc Locking Mechanism Located at the Back Cover

If the Valve is ordered with the Disc Locking Mechanism, make sure to activate the Locking Mechanism and lock the Disc, before dismantling the Gearbox. Not to do so will cause the above mentioned risks to occur.

Maintenance work should be done by experienced and skilled personnel. If there is no such personnel, please get in contact with DVD Valves and request your maintenance need. All personnel who will do the maintenance work should read and fully understand this Operation Manual.

Maintenance personnel should follow Occupational Health and Safety requirements and should use the necessary protective accessories (Work shoes, glasses, helmet, gloves etc.).

DVD KVN Butterfly Valve Spare Part lists and predicted life time of these parts are indicated as below:



NOTE:
PART LIFE TIME IS AN ASSUMPTION IN NORMAL OPERATING PRESSURE AND CONDITIONS
CIRCUMSTANCES THAT CAN OCCUR DUE TO FALSE OPERATION OR INAPPROPIATE CONDITIONS ARE NOT EVALUATED IN DETERMINING THE PART LIFE TIME

18	DISC PIM	-	STAINLESS STEEL	5 YEARS	
17	KEY	-	C45	5 YEARS	
16	WASHER	-	A2	5 YEARS	
15	SETSCREW	-	A2	5 YEARS	
14	BOLTS (COVER)		A2	5 YEARS	
13	BOLTS (RETAINING RING)	-	A2	5 YEARS	
12	O-RİNG (EXTERNAL)	-	EPDM	3 YEARS	
11	O-RİNG (INTERNAL)	-	EPDM	3 YEARS	
10	SEALING GASKET		EPDM	3 YEARS	
9	BACK COVER	GGG 40	DUCTILE IRON	10 YEARS	
8	FRONT COVER	GGG 40	DUCTILE IRON	10 YEARS	
7	SEALING	DELRIN		5 YEARS	
6	BEARING	SnBz10	BRONZE	5 YEARS	
5	SHORT SHAFT	X20Cr13	STAINLESS STEEL	5 YEARS	
4	LONG SHAFT	X20Cr13	STAINLESS STEEL	5 YEARS	
3	RETAINING RING	AISI 304	STAINLESS STEEL	5 YEARS	
2	DISC	GGG 40	DUCTILE IRON	10 YEARS	
1	BODY	GGG 40	DUCTILE IRON	10 YEARS	
ASSEMBLY	PART NAME	MATERIAL	STANDARD	PART LIFE TIME	NOTE

DRAWING NO	--	BUTTERFLY VALVE				DOĞUS VANA SANAYİ	
SIZE	A3					REV. DATE	
SCALE	DRAWING	Nuray KAFADAR		DRAWING DATE		REVISION	00
1:1	APPROVED	Alaattin YILDIRIM		03.10.2014		SHEET	00/01

PICTURE 11 – DVD Butterfly Valve Spare Part List and Predicted Life Time

This table is to provide a general idea to users, and life times can vary according to site conditions, application and operational conditions. Sealings should be changed when they are worn out or damaged.

All gasket and o-rings should be lubricated after renewal (w/ de-mineralized lubricant). If the Valve is potable water approved, potable water approved lubricants should be used.

DVD KVN Butterfly Valve Sealing Gasket can be removed without removing the Disc from the Valve Body.

Please follow the below steps to renew the Sealing Gasket (10):

1. Remove the Valve from the line, in line with the above mentioned requirements.
2. Bring the Valve Disc (2) to fully closed position.
3. Remove the bolts on the Retaining Ring (3).
4. Remove the Retaining Ring (3).
5. Bring the Valve Disc (2) to slightly open position to be able to remove the Sealing Gasket (10) and remove the Sealing Gasket (10).
6. Clean the Disc (2) gasket channel, gasket facing surface and retaining ring (3) facing surface.
7. Clean the Retaining Ring (3) and Body (1) Weld Overlay surface.
8. Install the new Sealing Gasket (10) on the Disc (2). Make sure that T shaped gasket is correctly fit to the gasket channel.
9. Install the Retaining Ring (3) on the Sealing Gasket (10). Make sure that the gasket is correctly fit with the Retaining Ring (3).
10. Screw the Retaining Ring (3) bolts in opposing order.
11. Check the functionality of the Valve.
12. After installing the Valve, check the Disc (2) for good sealing.

Gearbox renewal should be done by competent personnel only. It is recommended to get in contact with the manufacturer for this process.

Please follow the below steps to renew the Gearbox:

1. Remove the Valve from the line, in line with the above mentioned requirements.
2. Bring the Valve Disc (2) to fully open position.
3. Disc (2) shall be free and disperse, after removal of the Gearbox. Therefore, make sure to fix the Disc (2) in its position beforehand, by a crane or sufficient material. When fixing the Disc (2), make sure that the shafts (4 & 5) are not strained and that they are free from force. Make sure that the Disc (2) is firm and will not disperse after the removal of the Gearbox.
4. Remove the bolting of the Gearbox and take it out. Make sure that the Key (17) on the Shaft (4) is not out of its place.
5. Renew the Gearbox and install the new one on the Shaft (4), by fixing the Key (17); and screw the bolting in opposing order, back again.
6. Check the functionality of the Valve.
7. After installing the Valve, check the body shell for good sealing.

Front Cover (8) O-ring renewal should be done by competent personnel only. It is recommended to get in contact with the manufacturer for this process.

Please follow the below steps to renew the Front Cover (8) O-rings:

1. Remove the Valve from the line, in line with the above mentioned requirements.
2. Bring the Valve Disc (2) to fully open position.

3. Disc (2) shall be free and disperse, after removal of the Gearbox. Therefore, make sure to fix the Disc (2) in its position beforehand, by a crane or sufficient material. When fixing the Disc (2), make sure that the shafts (4 & 5) are not strained and that they are free from force. Make sure that the Disc (2) is firm and will not disperse after the removal of the Gearbox.
4. Remove the bolting of the Gearbox and take it out. Make sure that the Key (17) on the Shaft (4) is not out of its place.
5. Remove the bolting of the Front Cover (8) and take it out.
6. Renew the o-rings on the Front Cover (8). Make sure that the new O-rings are fit correctly.
7. Clean the O-ring surfaces and O-ring surface on the Valve Body.
8. Screw the Front Cover (8) bolts in opposing order.
9. Screw the Gearbox bolts in opposing order.
10. Check the functionality of the Valve.
11. After installing the Valve, check the body shell for good sealing.

Back Cover (9) O-ring renewal should be done by competent personnel only. It is recommended to get in contact with the manufacturer for this process.

Please follow the below steps to renew the Back Cover (9) O-rings:

1. Remove the Valve from the line, in line with the above mentioned requirements.
2. Bring the Valve Disc (2) to fully open position.
3. Remove the bolting of the Back Cover (9) and take it out.
4. Renew the o-rings on the Back Cover (9). Make sure that the new O-rings are fit correctly.
5. Clean the O-ring surfaces (14, 15) and O-ring surface on the Valve Body.
6. Screw the Back Cover (9) bolts in opposing order.
7. Check the functionality of the Valve.
8. After installing the Valve, check the body shell for good sealing.

CONTACT INFORMATION

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