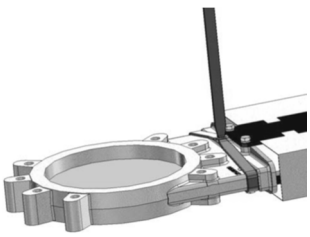
INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS TYPE BV50

1. Storage & Protection

Before storage always inspect the package for damaged or missing items upon delivery.
The valves have to be stored with the gate in open position.
The connections must be covered to protect the flange faces and internals for dust, dirt, oil or other impurities.
Store the valves indoors at a cool temperature between -10°C and 30°C in a dry place that is fire resistant, weather tight and well-ventilated. No corrosive chemicals should be present.
When an electric- or pneumatic actuator is mounted on the valve we recommend that is should be cycled approximately every 60 days.
Any spare parts for the valve shall be stored in the original packaging and under the same conditions as the valve is stored.
For storage longer than 4 months, the storage container should be inspected every four (4) months to ensure it is in good condition, and any additional protective coverings or materials are in working order. Ensure all parts are plugged, and bare metal is covered with a suitable rust inhibitor.
Avoid storage under direct sun exposure.
Do not stack unpacked valves.
After a long-term storage clean the valve, especially the sealing surfaces and check the valve's tightness before installation.
Do NOT toss the valves and do NOT lift them by the handwheel, gearbox, ,actuator or gate guards.
Do NOT lift the valve by the valve bore, this can damage the seating surfaces and the seals.
For lifting fix two or more eyebolts into the threaded mounting holes of the valve body or wrap soft straps tight around the body to lift the valve.
Use lifting equipment rated for the weight of the valve assembly.



Belven NV Blokhuisstraat 24 2800 Mechelen Belgium
Tel. +32 (0)15 29 40 70 Fax +32 (0) 15 20 14 13
info@belven.com www.belven.com

2. Cautions

FOR SAFETY, ONLY QUALIFIED, TRAINED PERSONNEL MAY HANDLE THE VALVES

FOLLOW THESE CAUTIONS BEFORE INSTALLING, REMOVING OR DISASSEMBLING THE VALVE.

1. KNOW WHAT MEDIA IS IN THE PIPELINE.
2. MAKE SURE THE LINE IS DEPRESSURIZED.
3. USE PROTECTIVE CLOTHING AND EQUIPMENT TO AVOID INJURY. KEEP HANDS AND OTHER BODY PARTS OUT OF THE VALVE.
4. ALWAYS ENSURE THE VALVE IS IN THE FULLY CLOSED POSITION BEFORE INSTALLATION, REMOVAL OR DISASSEMBLY.
5. CLEAN OF FLANGE FACES BEFORE INSTALLATION IN PIPELINE.

3. Installation

3.1. Warning Precautions

MAKE SURE THE VALVE CAN FULFILL THE REQUIREMENT OF THE PIPE EQUIPMENT.

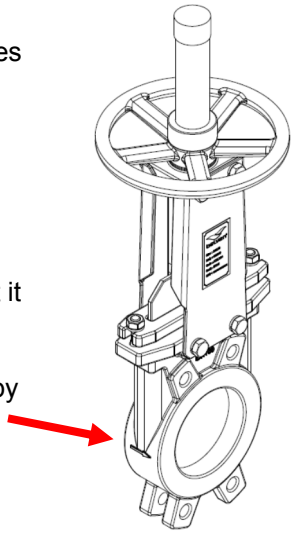
Before installation of the valve into the piping system, visually inspect the valve to determine if any damage has occurred during shipping or storage. For proper operation the valves must be undamaged and free of foreign material, please pay special attention that the valve cavities are clean. If other than superficial damage is discovered, contact Belven immediately, indicating the location and extent of the damage found.

BE AWARE OF GATE CUTTING MOVEMENT

Keep hands, tools and other objects out of the open port and leave no foreign objects inside of the pipeline. When the valve is actuated the gate functions as a cutting device. Always ensure the gate can't move during maintenance, always move an actuator to its rest position and detach the pressure supply line and/or electrical supply before performing any maintenance.

3.2. Installation Procedures

Tests and inspections of the open and closed valve are necessary to see if there is any trouble to open/close the valve.



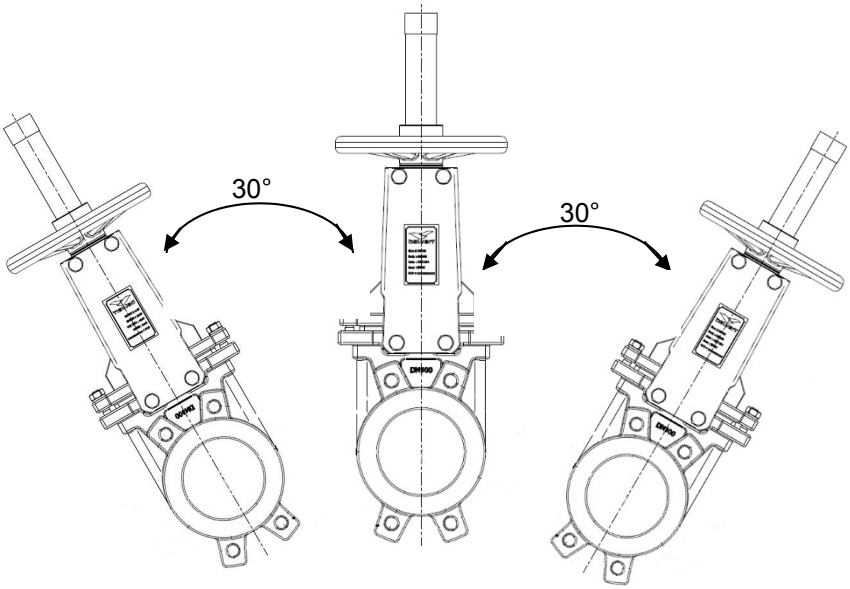
Prior to installation the pipeline must be cleaned from dirt and welding residues to avoid damage of the valve during operation. The pipe needs to be depressurized and cold (eg. no installation immediately after pipe flange welding).

As a rule, when the valve operates with clean liquids or with low solid content it is recommended to install it so that the pressure pushes the gate against the seat. That way, the fluid direction will be the same as the direction indicated by the arrow on the body.

Please keep in mind that the fluid direction is not always the same as the pressure direction. Installation and correct orientation with respect to the direction of the flow is the responsibility of the user.

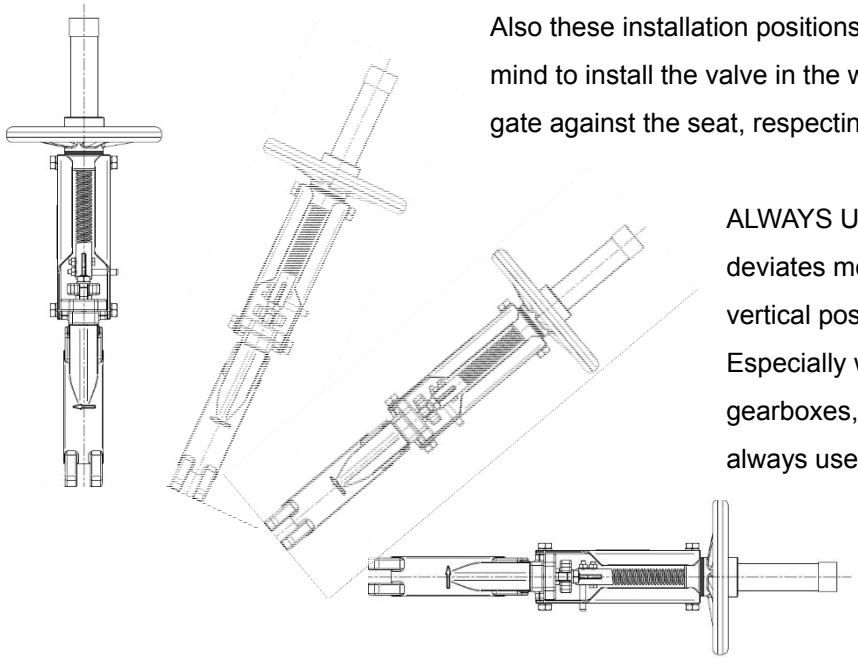
Take special care to maintain the correct distance (gap) between the flanges and ensure that these flanges are correctly aligned and parallel. The incorrect position or installation of the flanges can cause leakages or deformations on the valve's body which can cause difficulties during operation.

If possible install the valve with the shaft in vertical position, see below.



Angle of 30° as indicated above is also acceptable. More than 30°,upto 90° is also acceptable for valves DN50 to DN150, large sizes might give problems because they need extra guidance in between body and gate. Without these guides the gate might rub against the body and block.

Please avoid installing the valves with the stem downwards, medium will stay in body and might block the movement of the gate or cause leakage through the packing.



Also these installation positions are acceptable. Please keep in mind to install the valve in the way that the pressure pushes the gate against the seat, respecting the arrow on the body.

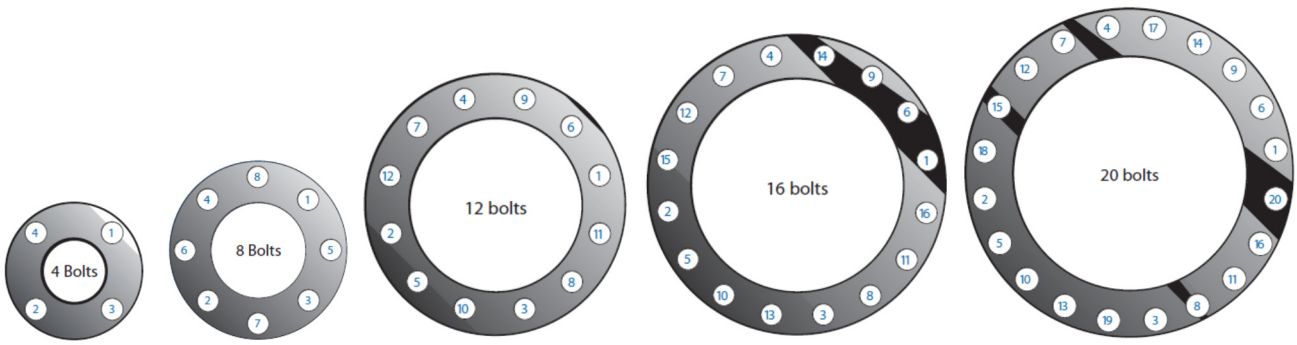
ALWAYS USE SUPPORTS when the shafts deviates more than 30° from the upwards vertical position.
Especially when using heavy operators like gearboxes, pneumatic or electric actuators always use the necessary supports to avoid that forces, like weight of the actuator, will bend the shaft.

The pipes have to be connected with the valve without generating tension.
When necessary support the pipeline to protect the valve from excess stress. Tensions should be cushioned by expansion joints or compensators. If supports are necessary for the valve, they should only support the dead weight of the valve and should not serve as base points for the pipeline.

Select proper flange gaskets according to the operating conditions and flange dimensions.
Make sure the faces of valve, gaskets and flanges are clean before installation.

Make sure the valve is fit correctly in between the flanges and is concentrically with the flanges..

When valve is placed in the central line of the pipe, first fasten the bolts as per opposite angles.
Flange bolts shall be fastened equally and simultaneously from both sides and no unilateral bolt fastening by force is allowed
Make sure the bolts are tightened in the correct sequence.



Belven NV Blokhuisstraat 24 2800 Mechelen Belgium
Tel. +32 (0)15 29 40 70 Fax +32 (0) 15 20 14 13
info@belven.com www.belven.com

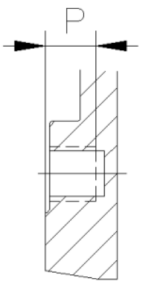
Below you find the indication bolting torques using 3mm thick rubber gaskets

The actual torque depends on the used gasket, please consult gasket manufacturer.

DN	SEAL AT 10 BAR Nm
50	70
65	70
80	70
100	75
125	90
150	115
200	110

DN	SEAL AT 10 BAR Nm
250	155
300	165
350	160
400	200
450	195
500	240
600	305

In next table you find the max. depth of the threaded blind holes in the bodies.

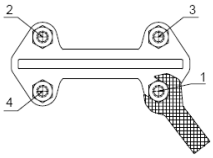


SIZE	50	65	80	100	125	150	200	250	300	350	400	450	500	600
P (mm)	8	8	9	9	9	10	10	12	12	21	21	22	22	22

Allthough the valve has been assembled and tested with the greatest care, during the handling and transport the nuts on the packing gland tend to come loose and must be re-tightened.

Once the valve is properly installed in the pipeline and the system has been pressurized, it is very important to check for any leakages from the packing gland to the environment.

In the event of a leakage, tighten the nuts on the packing gland crosswise until the leakage stops, ensuring that there is no metal to metal contact between the packing gland and the gate.



A very high tightening torque on the packing gland can lead to an increase in operation torque, reduction in the packing's life time, or the breaking of the packing gland.

Please respect the max. tightening torques in the table :

Tightening torques for packing gland	
DN50 to DN125	25 Nm
DN150 to DN300	30 Nm
DN350 to DN600	35 Nm

4. Operation & Maintenance

4.1. Operation

Respect the max. working pressures/temperatures of the valves as indicated on the datasheets.
Please make sure that all wetted parts of the valve are suitable for the fluid. The material of all valve parts are indicated on page 11 and 12 of this document. Please note that hard foreign parts can damage the seating area of the valve.
Do not use a lever extension for opening/closing the valve.
Any unsuitable operation action will cause leaking or other problems.
At commissioning ensure that no dirt or foreign objects are left inside the valve or pipeline. Flush the pipeline carefully
Never untighten a bolt when the valve is in service.
When there is pipeline vibration, the valve must be supported so that pipeline stresses are not transmitted to the valve and actuator.

4.2. Maintenance

The valve has to be periodically checked to make sure of its proper operation. For a correct function of the valve it is recommended that the valve is cycled several times from fully open to fully closed every 3 months. A higher checking frequency is recommended when the valve is working under extreme conditions.

LUBRICATION
We recommend twice a year lubrication of the stem.
Remove the protection cap and fill up the stem protector tube halfway with a calcium-based grease with the following characteristics:

- highly water resistant
- low ash content and
- excellent adherence.

Periodical overhaul should be made to check the tightness, wear, aging of the packing and corrosion of valve body. If any of the problems above is found, maintenance or replacement should be performed immediately.

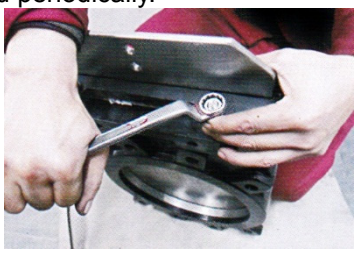
Before dismounting the valve make sure the system is depressurized and cooled down.
NEVER DISMANTLE OR REMOVE THE VALVE FROM THE PIPELINE WHEN IT IS PRESSURIZED.
Always isolate the relevant part of the pipeline, release the pressure from the valve and remove the medium before dismantling the valve. Be aware of the type of medium involved. Protect people and environment from any harmful or poisonous substances. Make sure no medium can enter the pipeline during valve maintenance.

BE AWARE OF VERY COLD OR HOT VALVE
The valve body may be very cold or very hot during use. Always protect yourself against cold injuries and burns.
Handling and maintenance must always been done by qualified and trained personnel.

Before carrying out any maintenance ensure this operating- and maintenance manual or relevant drawings are available to facilitate identification and location of the component parts.
All the valve parts for replacement shall be the same as the original ones in size and material.
Only use the original Belven spares to replace the parts in the valve.
Don't let the valve remain disassembled in the work shop, it can only higher the risk of dirt entering the valve or corrosion of the metal parts.

4.2.A. PACKING MAINTENANCE

Routine maintenance of the packing consists of tightening the packing gland periodically.
If leakage around the packing is discovered, first tighten the hex-nuts on the packing gland. Do not over-tighten the hex-nuts, this can damages the packing and increase the operation torque of the valve, the torques in the table should be respected.



Tightening torques for packing gland	
DN50 to DN125	25 Nm
DN150 to DN300	30 Nm
DN350 to DN600	35 Nm

If the leakage still persists, replace the packing according to the procedure on next page.

Make sure the system is depressurized and cooled down

Use appropriate personal protection equipment (gloves, safety shoes, etc).

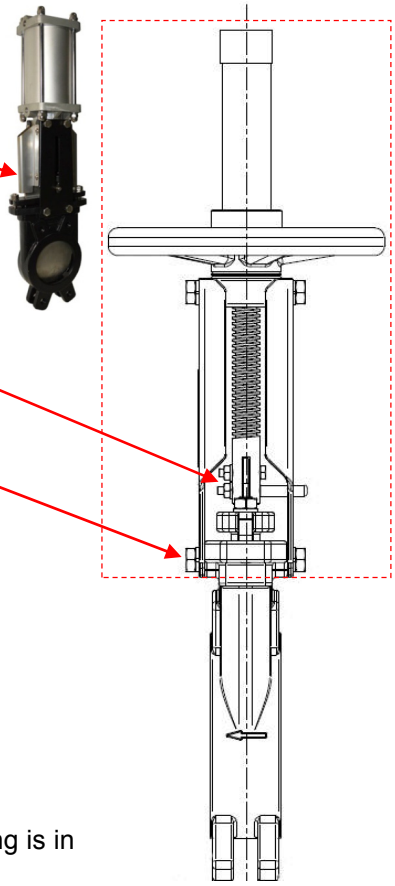
Shut off all operating lines to the valve and place a warning sign.

Isolate the valve completely from the process, release process pressure and drain the process fluid from the valve.

When valve it automatic actuated, remove the safety guards

Disassemble the shaft from the gate

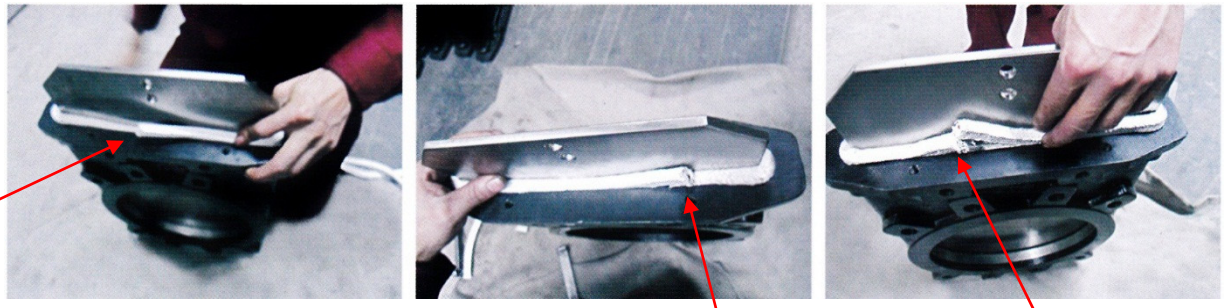
Loosen the bolts of the support plates from the body and remove the support plates with shaft and operator from the body.



Remove the packing gland

Remove the old packing and clean the body space for the packing.

Put 3 layers of new packing in place, re-assure that each joint of packing is in a different place.



Assemble the packing gland and steady start tightening of the packing gland, crosswise

With respect the max. tightening torques in the table :

Tightening torques for packing gland	
DN50 to DN125	25 Nm
DN150 to DN300	30 Nm
DN350 to DN600	35 Nm

Re-assemble the support plates with the handwheel or actuator

Tighten the bolts of the support plates into the body

Fix the gate in the shaft with the 2 bolts.

When valve with actuator re-mount the safety guards

Check if the valve is operating well by opening and closing it.

Pressurize the system and carry out some operations.

When necessary re-tighten the packing gland to prevent leakage.

4.2.B. REPLACEMENT OF THE SEAL RING

When the valve is not giving a tight shut-off in the pipeline it might be the seal ring (valve seat) is damaged.

For replacing to the seal ring follow the same procedure as previous described for the packing :

Make sure the system is depressurized and cooled down

Use appropriate personal protection equipment (gloves, safety shoes, etc).

Shut off all operating lines to the valve and place a warning sign.

Isolate the valve completely from the process, release process pressure and drain the process fluid from the valve.

When valve it automatic actuated, remove the safety guards

Disassemble the shaft from the gate

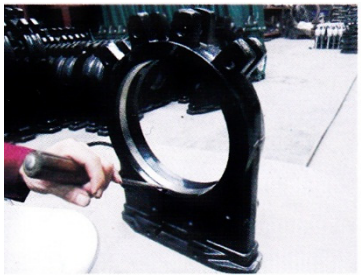
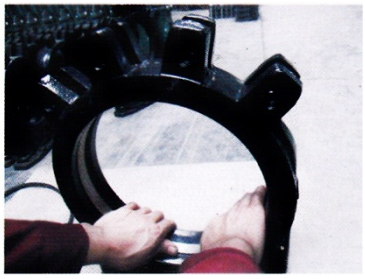
Loosen the bolts of the support plates from the body and remove the support plates with shaft and operator from the body.

Remove the packing gland

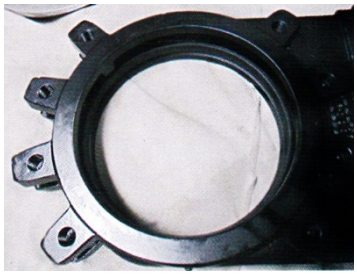
Remove the old packing and clean the body space for the packing.

Remove the gate

Remove the retainer ring

Remove the old EPDM seal ring, clean the body space of the seal ring and mount a new EPDM ring

Re-assemble the retainer on the EPDM seal ring, hammering gently around the edge,

place the gate and insert the 3 layers of packing


Continue the procedure of the packing replacement to totally re-assemble the valve :

Assemble the packing gland and steady start tightening of the packing gland, crosswise with respect of the max. tightening torques in the table of 4.2.A.

Re-assemble the support plates with the handwheel or actuator

Tighten the bolts of the support plates into the body

Fix the gate in the shaft with the 2 bolts.

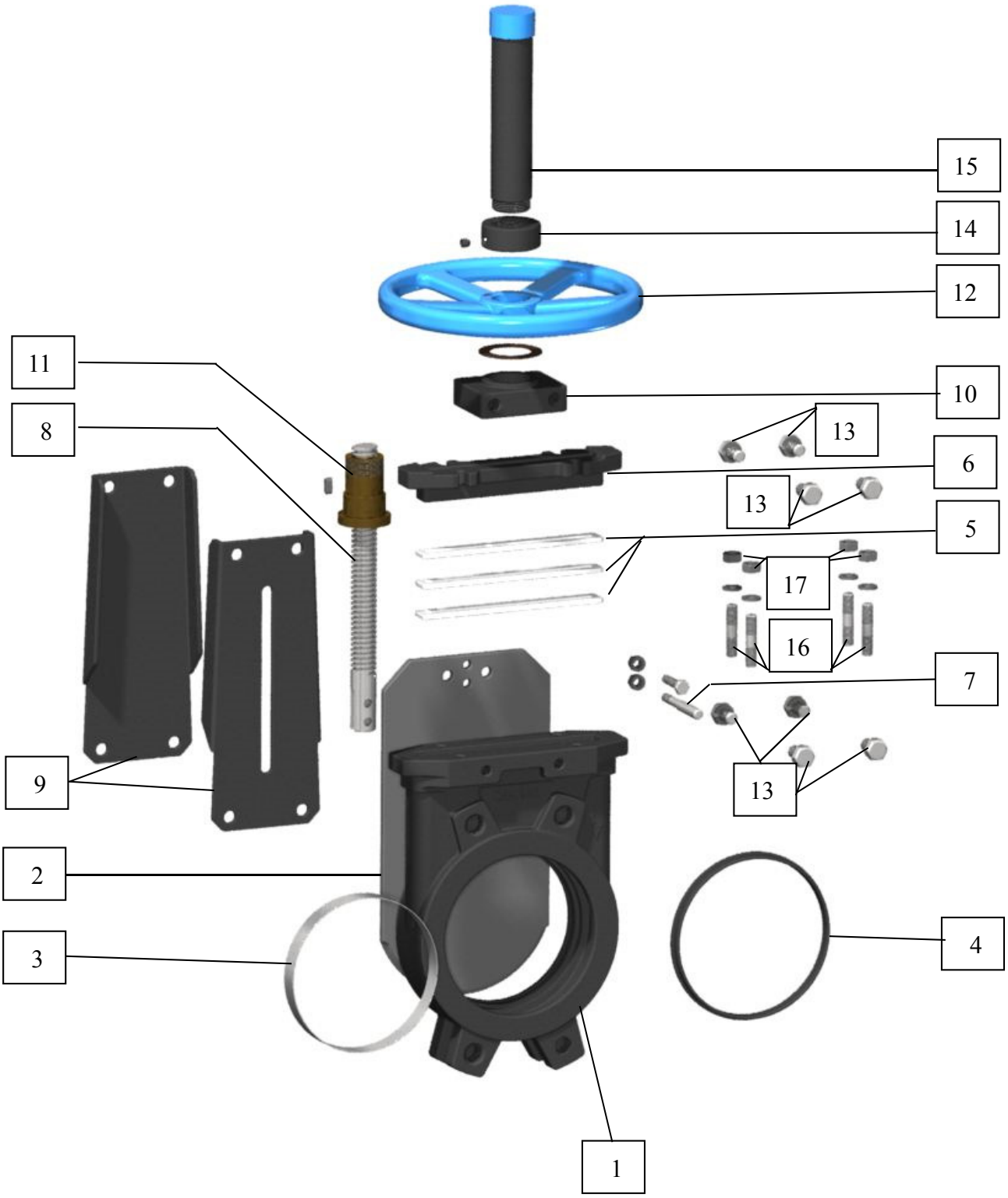
When valve with actuator re-mount the safety guards

Check if the valve is operating well by opening and closing it.

Pressurize the system and carry out some operations.

When necessary re-tighten the packing gland to prevent leakage.

4.3. Materials



Belven NV Blokhuisstraat 24 2800 Mechelen Belgium
Tel. +32 (0)15 29 40 70 Fax +32 (0) 15 20 14 13
info@belven.com www.belven.com

ITEM	NAME	MATERIAL
1	BODY	DUCTILE IRON GGG40
2	GATE	STAINLESS STEEL SS304
3	RETAINER RING	STAINLESS STEEL SS304
4	SEALING RING	EPDM
5	PACKING	PTFE + SILICONE
6	PACKING GLAND	DUCTILE IRON GGG40
7	POSITION INDICATOR	STAINLESS STEEL SS420
8	STEM	STAINLESS STEEL ASTM A276 420
9	SUPPORT PLATES	STEEL ASTM A36
10	TOP PLATE	STEEL ASTM A216 WCB
11	STEM NUT	ALUBRONZE ASTM B148 C95200
12	HANDWHEEL	PLATED STEEL
13	BOLT	ASTM A193 B7
14	HANDWHEEL CAP	STEEL ASTM A36
15	STEM PROTECTOR TUBE	STEEL ASTM A36
16	BOLT	ASTM A193 B7
17	NUT	ASTM A194 2H