KNIFE GATE VALVES

T500 / T500Bi

INSTALLATION & MAINTENANCE MANUAL

ZUBI

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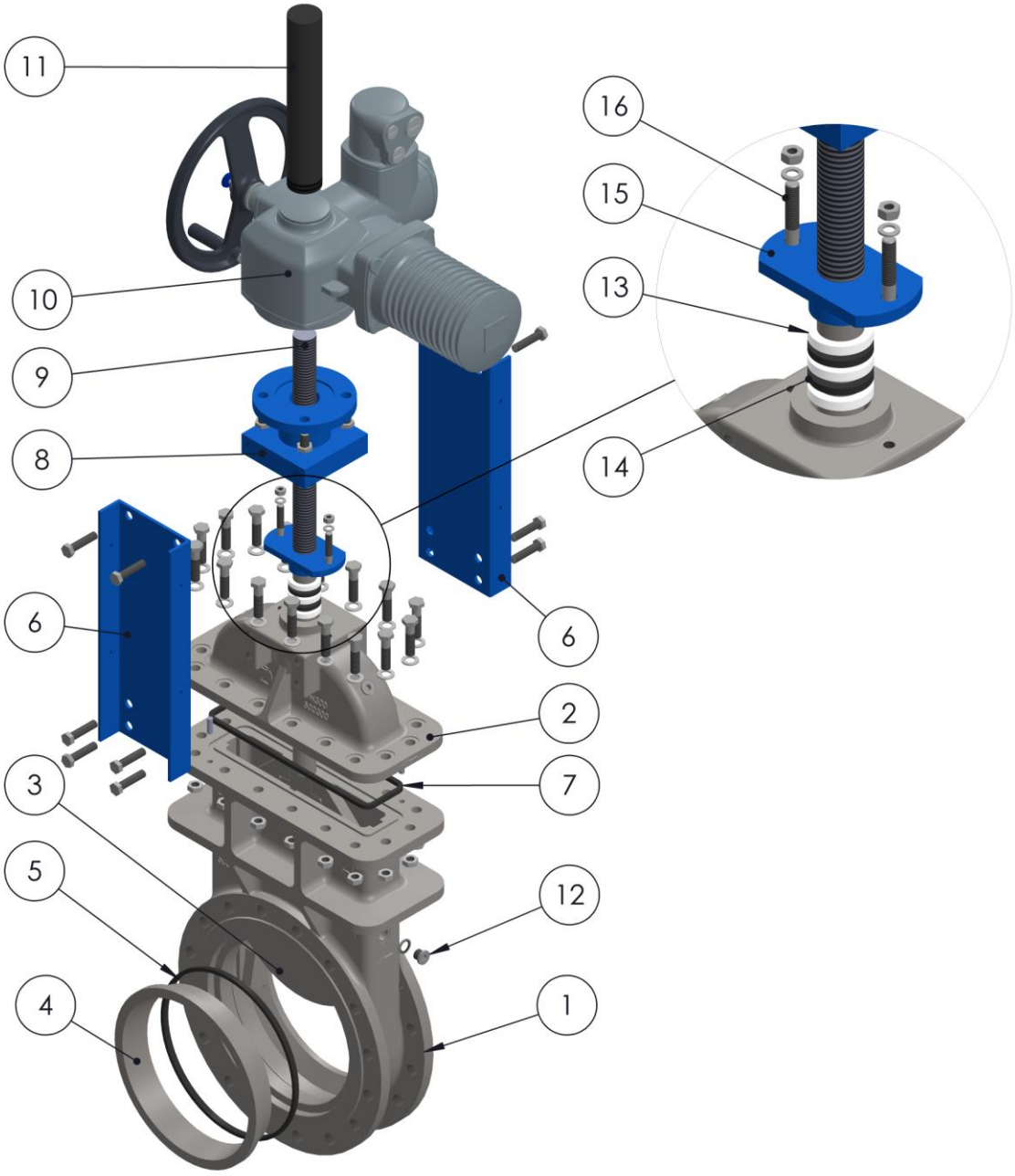
1. List of components / General arrangement



1	Body	9	Stem
2	Bonnet	10	Actuator
3	Gate	11	Stem prot. tube
4	Scraper ring	12	Flushing holes plugs
5	Seat	13	Packing
6	Support plate	14	Toric joint
7	Body-bonnet joint	15	Packing gland
8	Actuator bridge	16	Studs

2. Description

The model 500 is a flanged unidirectional or bidirectional knife gate valve. It is designed for high pressure applications, up to PN25. Single piece monoblock body with internal wedges and screwed down bonnet to guarantee the tightness.

Valve provides high flow rate with low pressure drop.

Face to face as per VALVULAS ZUBI, S.L. standard (check product datasheet).

Suitable for clean and slightly charged fluids with solids.

Sizes: DN150-DN1600 (bigger/smaller please check possibilities with Sales Department).

The Model 500 complies with the following European directives:

- 2006/42/CE (Machinery Directive)
- 2014/68/EU (PED)

Working pressures:

DN150 – DN800 25bar

DN900 – DN1600 10bar

Flanges: PN10, PN16, PN25, ANSI150. Others on request.

3. Handling

It is important to pay attention to the following points when handling the valve.

Before valve manipulation, check that crane equipment is capable of bearing its weight.

To prevent damage on the anti corrosive protection/coating, it is recommended to use soft lifting elements/straps.

Do not lift the valve by the actuator or by the guards as they are not designed for it, you should use threaded eyebolts into threaded holes in the body. It is also not advised to hold the valve through the bore of the valve as this could damage or dislodge the seat.

It is convenient to use threaded lifting eye bolts connected to body threads or soft straps to manipulate and lift the valve. DN800 bigger size valves are provided with eye bolt facility.

4. Installation

For proper installation of the Model 500 valves it is important to consider the following:

Personnel handling and installing the valves must be trained and must comply with all necessary safety regulations. Use suitable Personal Protection Equipment (PPE) such gloves, safety boots, goggles etc.

Cut the pressure in the valve line and put a warning sign to inform about the work being performed.

Prior to installation of the valve is important to inspect and verify that it has not suffered any damage or harm during shipping and/or storage.

Make sure that the internal bore of the valve is clean and free from debris, also that the adjoining areas where it will be installed are free from dirt, weld deposits and that the flange facings are clean. Make sure the gaskets used are suitable.

The distance between the connection flanges must be correctly aligned and parallel, any defects will cause difficulties in the operation. Special care should be taken to maintain the correct distance between the flanges and to ensure that they are parallel to the valve body.

Incorrect alignment of the valve can cause deformations, which can lead to difficulties in operation.

Tighten bolts with caution, so that tensions in the body do not cause any cracking or breaking.

The T500 valve is provided with correct mounting pressure direction arrow. In case of bidirectional valve design mounting position is not important, since valve has a double seal.

**Note that the direction of fluid need not always be equal to the direction of pressure.*

As a general rule, the valve should be installed vertically on horizontal pipe. However it is also possible to mount it in any other position as long as you consider that any actuators fitted to the valve are adequately supported when the position is horizontal or inclined.

Once the valve has been installed and securing the flanges are tight, operate the valve under pressure and check the seal under load. It is important to note that during transportation or storage of the valve the gland material might have settled, so that, in the event of leak, tighten the gland nuts gradually and in a crosswise pattern. Only tighten just enough to prevent any leakage. If the gland is overtighten, as this reduces the life of the gland and increase the force required to operate the valve, possibly causing damage.

5. Actuators / Operation

Hand Wheel

To open the valve turn the hand wheel counterclockwise, to shut valve turn the hand wheel clockwise. Recommended up to size DN300 and maximum service pressure of PN10/16.

Pneumatic

For pneumatically double-acting operated valves, the recommended air pressure is 5 to 6 bar.

We recommend dry compressed air, filtered and lubricated for proper operation and longevity of the cylinder.

Hydraulic

Where valves are operated with hydraulic cylinders, is important to use clean hydraulic and to maintain the cylinders on a regular basis. It is recommended specifying low temperature oils in areas where the valves are constantly exposed to cold temperatures.

Gear-box

The operation with a gearbox is similar to the drive wheel. For best performance it is recommended to lubricate the gear every six months. Where valves are in storage it is recommended to operate every 4 months.

Electric

In case Electric Actuators is included the Actuator manufacturer IOM will be supplied

Note: In case Electric Actuator is not installed &tested with the valve by VALVULAS ZUBI, S.L., product guarantee will not be given

6. Maintenance

T500 valve correct maintenance recommendations are 3:

1) Packing replacement (13, 14)

2) Seat replacement (5)

3) Body-bonnet o´ring replacement (7)

*Pneumatic actuator seal kit change (for pneumatic actuators)

In case of manual valves spindle greasing is recommended every 6 months

VALVULAS ZUBI is not responsible for any damage that may occur due to the use of non-original components or spare parts. For any modification, consult VALVULAS ZUBI, S.L. for advice.

Measures to take into account:

The installation and handling process, as well as the maintenance of the valves, must be carried out by trained personnel using appropriate personal protection equipment (gloves, safety shoes, etc).

Release process pressure and drain process fluid from the valve, isolating the valve from the process. Clear the area where we are manipulating the valve to avoid accidents.

a) Packing replacement

It is important to replace the packing set. The life of these elements will depend on the working conditions of the valve such as: pressure, temperature, abrasion, chemical action, number of operations, etc. Maintenance should be carried out as follows:

** Bear in mind that in this process we will remove the valve drive so it would be advisable to use lifting gear if you consider it necessary.*

1. Before removing the valve from pipe, line pressure will be disconnected and knife moved into close position.
2. Although not absolutely essential, release one of the support plates to have more work space.
3. Then, loosen the nuts holding the gland follower to remove that part.
4. Remove the old packing with a pointed tool.
5. Clean the packing are and install the new one. Please check that the ends of new packing are well aligned.



6. Install the original gland follower tightening the nuts progressively. Check that the distance between the gland follower and shaft is equal in all areas. Finally install the support plate.
7. Test the valve with No pressure to check packing is well aligned.
8. Finally pressurize the system to check packing leak points, if necessary overtighten the gland follower to stop the leak.

b) Seat replacement

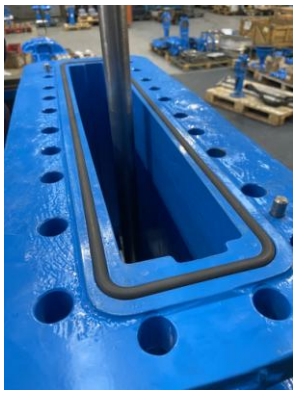
The seats are in place only in valves where leak tight closure is required or on bidirectional type. It is important to make changes either for regular maintenance (depending on the number of operations and the state of the circulating fluid) or due to the detection of leakage across the valve. The seat must be changed as follows:

1. Remove the valve from the pipeline, making sure the line is not under pressure before removing. Fully open the valve.
2. Clean the inside of the valve.
3. With a drift remove the seat retaining ring. Remove the old seat and clean the body of debris.
4. The seat is replaced making sure the join is in the upper body. It is recommended to apply some grease to the seat to ease into the body and to keep in place.
5. Later, reinforced sealing ring will be installed again.
6. The valve assembly will be performed in reverse order to disassembly.
7. Finally valve will open/close several times to check leak problems.

**To replace a Teflon (PTFE) seat it is recommended to preheat at 50º to soften and ease of replacement.*

c) Body-bonnet o´ring replacement

1. Make sure there is absolutely no pressure and fluid in the system and place the valve is open position.
2. Release the nuts connecting body and bonnet.
3. Remove the top actuator, shaft, bonnet and knife from the body.
4. Once previous step is made remove the body and bonnet o´ring.



5. Clean the area and install new same size and quality o´ring .
6. The valve assembly will be performed in reverse order to disassembly. The body has 2 centering holes that will facilitate the installation of the bonnet.
7. Maneuver several times without line pressure.
8. Finally pressurize the system to check leak points from the body/bonnet o´ring. In case of leak, tighten the bonnet nuts until leak stops.

d) Maintenance of pneumatic cylinders

The actuators seals must be replaced if leaking is detected between the two cylinder chambers. This leak is due to the deterioration of the seals or cylinder liner.

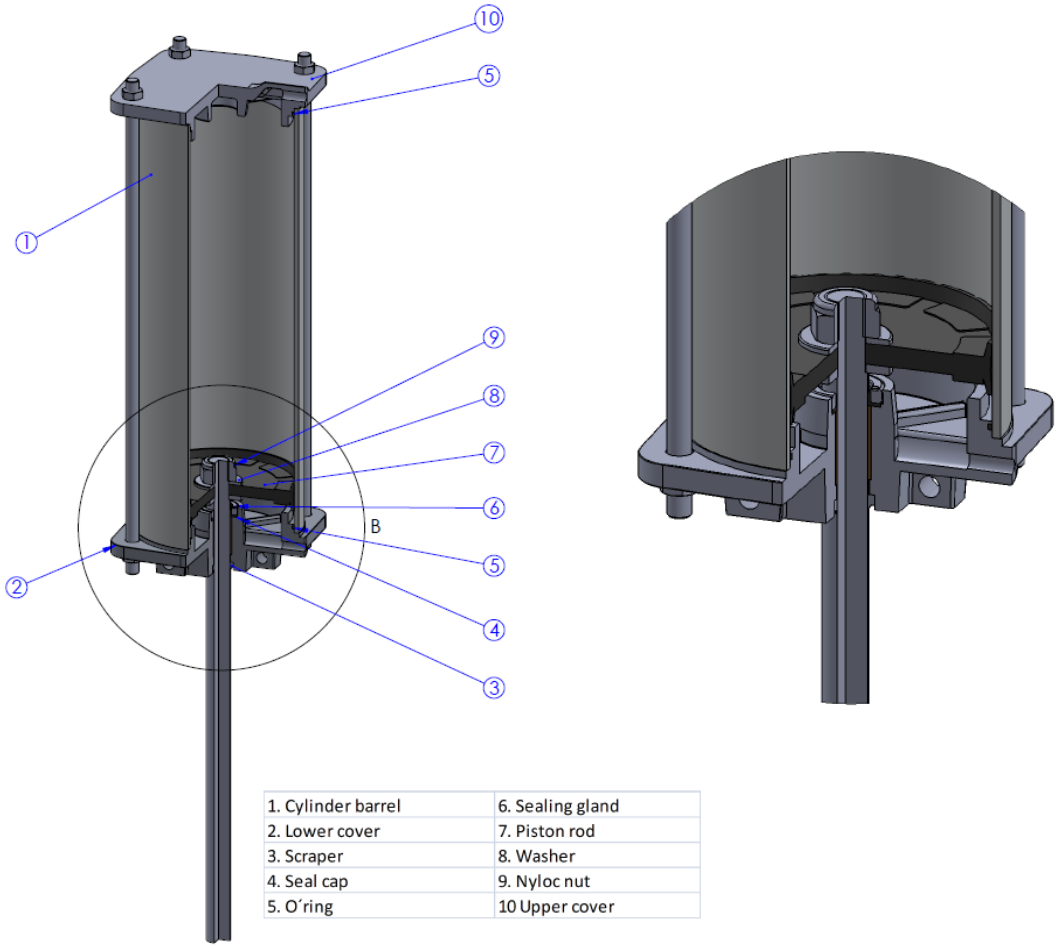
Complete replacement of the cylinder must be made as follows:

1. Disconnect the cylinder from the air supply with the valve in the closed position; make sure all the air is drained out of the cylinder.
2. Loosen and remove the lower bolts on the support plates.
3. Disconnect the shaft from the gate.
4. Next, install the new actuator, reconnecting the shaft to the gate.
5. Replace the support plates and tighten the bolts.

6. Operate the valve several times before placing back in line, pressurise with air not exceeding 7 bar or less than 5, thus proving the proper functioning of the cylinder.

When replacing the cylinder components, you must follow the guidelines above as 1-2-3 then as follows:

- To renew the o-rings on the covers, undo the tie rod nuts; carefully remove cover tapping gently upwards trying not to damage the barrel or cap. Remove old o-ring and clean cap, insert new o-ring and replace cap. Tighten the nuts on the tie rods diagonally.
- To replace the piston, remove the upper cover and the cylinder barrel leaving the piston exposed inside. Subsequently, undo the nyloc nut and washer holding the piston to the piston rod, removed the damaged piston, clean thread and replace with new piston washer and new nyloc nut.
- To replace the seal cap, loosen the sealing gland, leaving free the damaged seal.



1. Cylinder barrel	6. Sealing gland
2. Lower cover	7. Piston rod
3. Scraper	8. Washer
4. Seal cap	9. Nyloc nut
5. O´ring	10 Upper cover

7. Recommendations

For proper maintenance of the valves, we recommend periodic changes as mentioned in the valve components. Its duration will depend on the working conditions, temperature and chemical corrosion to which they are subjected.

8. Storage

- Valves should be stored in a well ventilated place at a temperature not exceeding 30ºC, especially in long-term storage, because seats & gaskets may deteriorate.
- It is recommended to store the valves under cover, but if this is not possible and they have to be stored outside, it is advisable to leave in the plastic covered crates where the valves are delivered in and cover the crates with suitable tarpaulins.
- Dynamic areas of valves, especially the shaft, must remain greased, for it, it is important to conduct periodic inspections and grease as needed. Valves will need to be operated to make greasing effective.

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