

# MANUAL OF WORKING INSTRUCTIONS, ASSEMBLING, MAINTENANCE AND STORAGE



## PTFE BUTTERFLY VALVES

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|--|----------|
| <b>1. GENERAL</b>                                      | <b>2</b> |
| <b>2. WARNINGS</b>                                     | <b>2</b> |
| <b>3. WORKING CONDITIONS AND TECHNICAL INFORMATION</b> | <b>3</b> |
| <b>4. OPERATION AND DIRECTION OF ROTATION</b>          | <b>3</b> |
| <b>5. INSTALLATION INSTRUCTIONS</b>                    | <b>5</b> |
| <b>6. MAINTENANCE INSTRUCTIONS</b>                     | <b>6</b> |
| <b>7. STORAGE INSTRUCTIONS</b>                         | <b>9</b> |

## 1. GENERAL

This instructions manual contains important information concerning the installation, operation, maintenance and storage of **TTV** PTFE butterfly valves.

Please read carefully these instructions and keep them for future occasions.

It is important that only well- informed and qualified people operate the valves.

## 2. WARNINGS

- Make sure that the valves are used within the limits established in the technical specifications.
- Using the valves above the temperature limits can damage the internal and the external elements.
- Using the valves above the pressure limits can damage the internal and the external elements.
- Using the valve in corrosive environments, without the proper protection, can damage the internal and the external elements.
- Do not try to dismantle any part of the valve while it is installed in the pipe, and do not do it either if there is fluid inside.
- Purge the whole installation, making sure there is no air inside when the fluid is liquid.
- Do not dismantle the shaft while the valve is installed in the pipe; the disc would be carried away through the pipe due to the pressure of the fluid.
- Make sure which is the direction of rotation of the valve when mounting any type of actuator (there are stops clearly marked and opening/closing icons of the disc at 90°).
- It is necessary that the customer specifies if the valves are to be installed at the pipeline end.

### 3. WORKING CONDITIONS AND TECHNICAL INFORMATION

- **Fluids:**  
These valves are delivered for liquid as well as for gas services.  
It is the responsibility of the customer or of the engineering which leads the project, to choose the most appropriate materials for the required service, as well as the evaluation of the installation risks.
- **Working pressure:**  
These valves are delivered for a working pressure of 16 bar maximum up to DN300 and a working pressure of 10 bar in diameters DN350 to DN600. For special constructions, please contact to the technical department of TTV.
- **Working temperature:**  
The standard delivered valves are between the ranges of temperatures from -10 °C to +100 °C for maximum pressures of 16 bar and from -10 °C to 160 °C for maximum pressures of 10 bar. For special constructions, please contact to the technical department of TTV.
- **Ambient temperature:**  
The standard delivered valves are designed to work within the range -10 °C to +80 °C.
- **Operation time:**  
These valves are delivered with a connecting flange as per ISO 5211.  
The time of operation will vary depending on the type of operation assembled.
- **Stroke:**  
The standard construction has a rotating stroke from 0 to 90 degrees and from 90 to 0 degrees.
- **Lubrication:**  
**TTV** butterfly valves are not lubricated.
- **Construction:**  
Movement transmission through the splined shaft and disc, designed for inside and outside installations. When the disc is PTFE coated, the shaft and disc are in one piece.
- **Protection and resistance against corrosion:**  
Every standard valve is delivered with protection against corrosion for normal environmental conditions.  
For this reason the body of valves undergo a process of rilsanization (RILSAN Polyamide 11).  
Before installing the valves in aggressive environmental conditions, make sure you have chosen the appropriate protection.
- **Valves labelling and designation:**  
The type of valve, diameter, pressure design, maximum working pressure, sealing ring, reference is stated in the valve designation.

**TTV** valves are delivered with labels containing the following information: **TTV** anagram, type, model, type of operation, design pressure, maximum pressure, lining, manufacturing order, date and **CE** marking.

### 4. OPERATION AND DIRECTION OF ROTATION

In order to close the valve, the shaft is moved clockwise, to open the valve the shaft is moved in the opposite direction.  
The valve is regulated by means of the operation devices, which are the following:

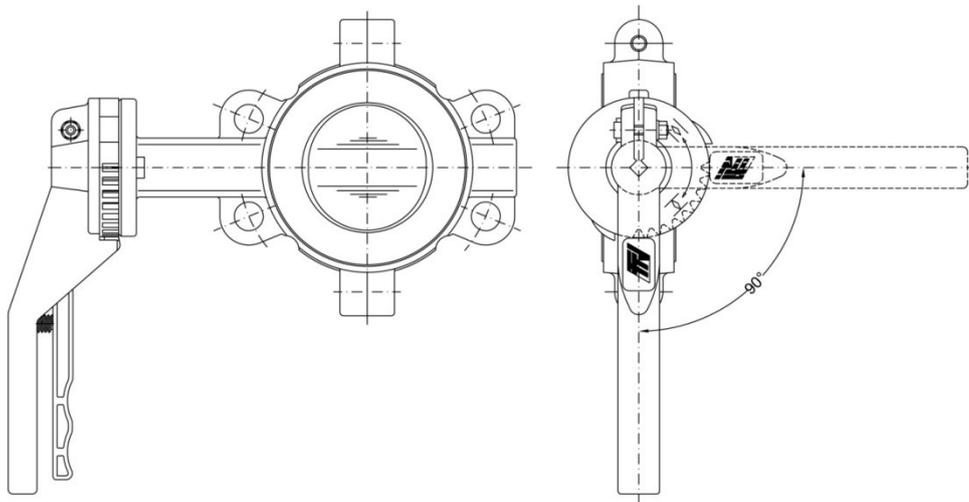
a) Manual actuator with lever

The regulation is carried out by means of the notched flange and the lever's trigger.

For this purpose, the trigger is declutched from the flange and it is turned in the appropriate direction to open or to close the valve.

Then the trigger is clutched again in the flange in the desired position.

(Figure A)



b) Manual actuator with gearbox

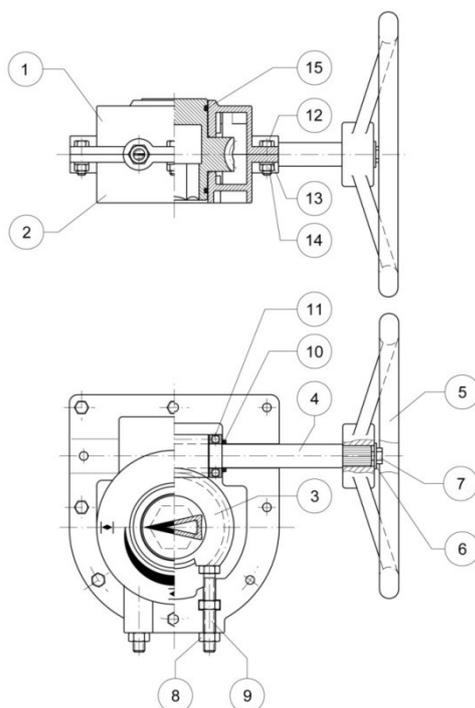
The movement  $\frac{1}{4}$  turn ( $90^\circ$ ) is made by a wheel's turning, which at the same time moves a worm wheel.

The movement is regulated by the bolts (item 9 figure B).

For this purpose the nut is loosened (item 8 figure B) and the bolt is introduced or taken out depending on how opened or closed the disc is required. We would proceed the same way to close the disc completely.

It is necessary to check the indication arrow in the gearbox indicator and the opening/closing icons of the gearbox. There is no need to dismount any piece of the gearbox for this purpose.

(Figure B)



c) Pneumatic actuator

Request working instructions, assembly and maintenance for the specific actuator.

d) Actuator with servomotor

Request working instructions, assembly and maintenance for the specific electric actuator.

## 5. INSTALLATION INSTRUCTIONS

### 5.1.- Installation of Wafer type valves

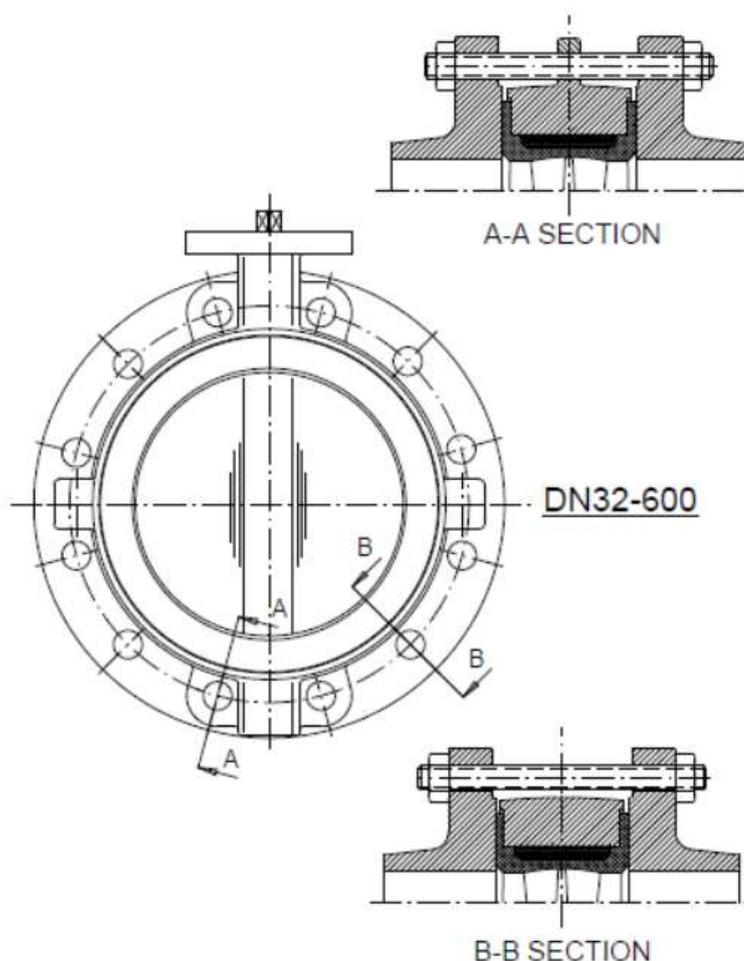
The valves are usually delivered slightly open. Check they are so before mounting them on the pipe.

Once the space for the valve is checked, they are put in line in the pipe. Then, some studs are placed in order to center the valve in line with the pipe.

The next step is to open the disc 90° and put the rest of the studs with their nuts.

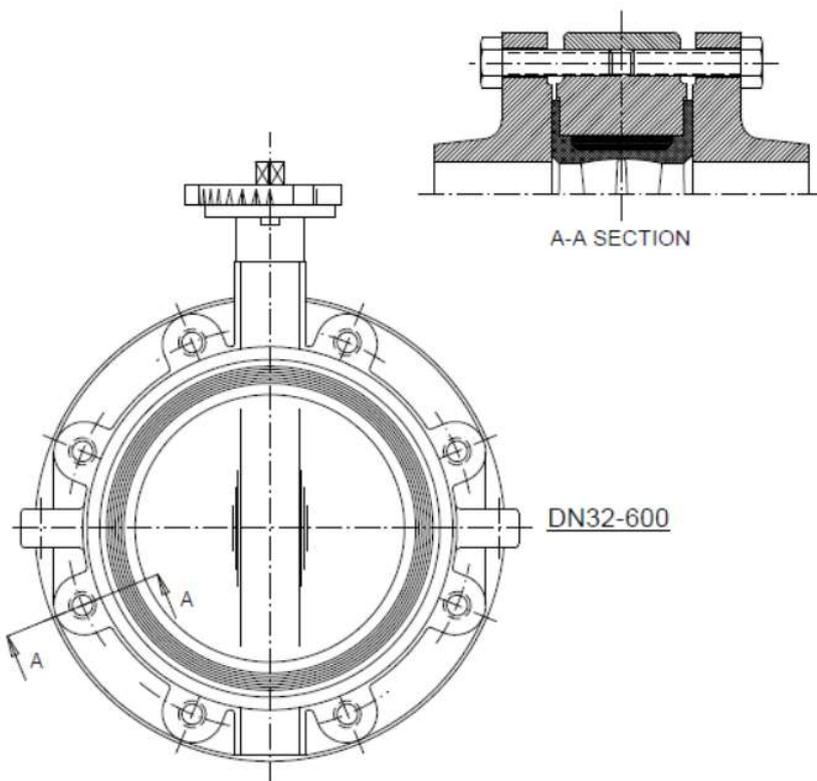
Finally it is proceed to tighten the nuts (following a triangular tightening scheme) with the purpose of having every stud uniformly tighten and not producing any deformation in the liners.

It must be checked that the valve can be opened and closed without any problem.



## 5.2.- Installation of Lug type valves

It follows the same procedure detailed for the wafer type valves but with the difference that these valves should be installed with bolts, whose length allows the perfect tightening between the flanges and the pipe. These bolts cannot be longer than allowed.



## 5.3.- Mounting position

The valves are bidirectional. They can be installed on any side as it is not necessary to keep the flow direction.

### WARNINGS TO THE ASSEMBLY

- Before the valves are mounted, the elastomer sealing ring have to be clean so as to guarantee the tightness of the valve.
- There has to be room for the valve to prevent the sealing ring from any damage when introducing the valve.
- Be careful during its installation as the painting could be damaged.
- Make sure, during the assembling of heavy valves, that the eye bolts and slings meet the security standards.

## 6. MAINTENANCE INSTRUCTIONS

TTV valves require little maintenance. However, due to the possible high work requirement, the following maintenance actions should be conducted, if so required.

The assembling and disassembling of the valve is only allowed to **TTV** staff or people specialised in this field. If these norms are not followed, then the guarantee will not have any validity.

## 6.1) Description and spare parts recommended.

6.1.1) Wafer and Lug type PTFE butterfly valves **DN40 to DN300** with stainless steel disc.

### ASSEMBLY INSTRUCTIONS

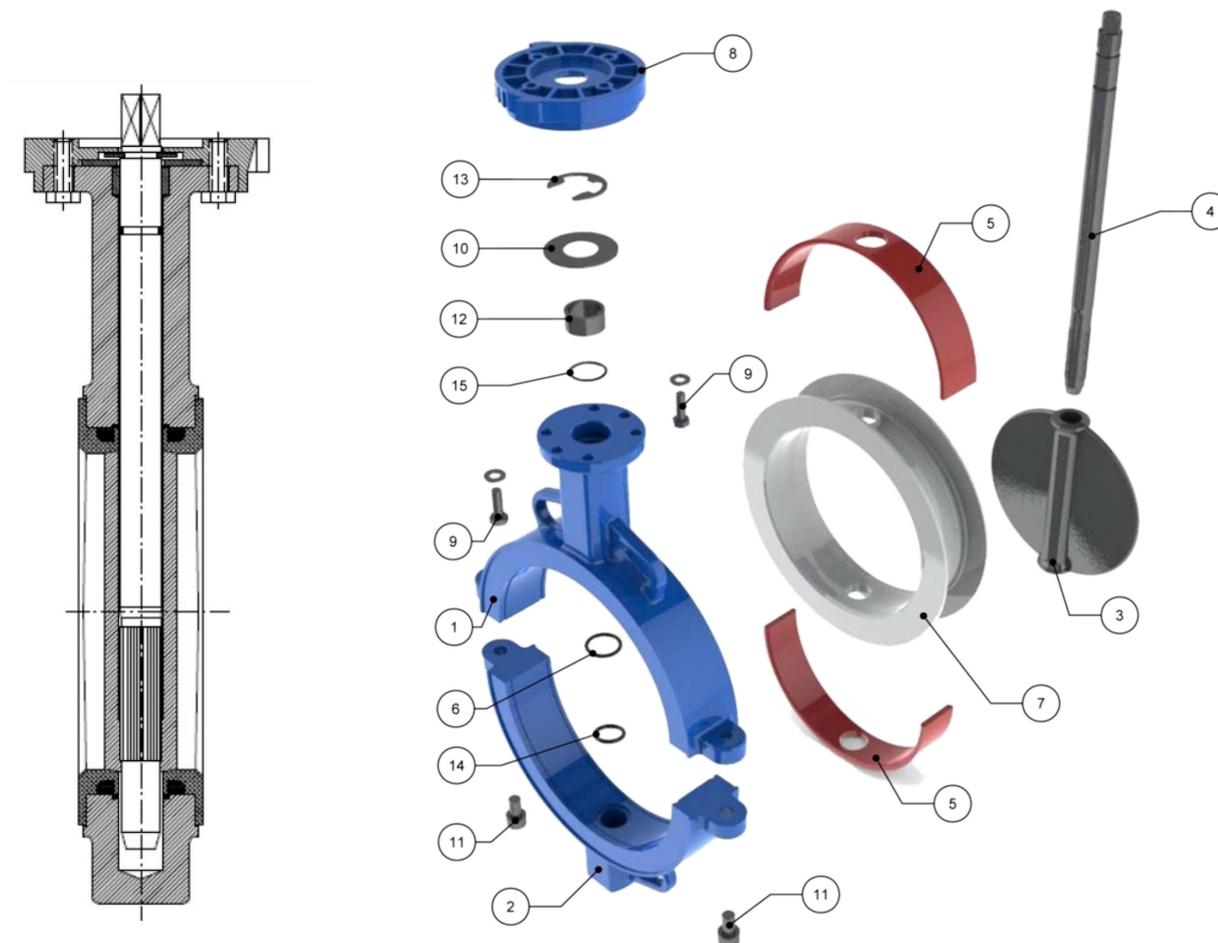
1. Insert disc (3) in the PTFE ring (7).
2. Insert shaft (4) in the ring (7) and disc (3).
3. Place the bottom silicone gasket (5) on the outside of the ring.
4. Insert O-ring (14) through the lower part of shaft until we reach the ring.
5. Fit the lower part of body (2).
6. Place the top silicone gasket over the ring.
7. Insert the O-ring (6) through the upper part of shaft (4) until we reach the ring (7).
8. Fit the upper part of body (1).
9. Screw (11) the two halves of body through the lug union.
10. Insert the O-ring (15) in the upper part of body housing through the shaft.
11. Insert the bushing (12).
12. Insert the washer (10).
13. Insert the cir-clip (13).
14. Place the flange (8) on the head of valve and tighten it with bolts (9).

### DISASSEMBLY INSTRUCTIONS

1. Unscrew (9) and remove the flange (8) from the head of valve.
2. Unscrew (11) and remove the two halves of body (1 and 2).
3. Remove O-rings (6 and 14).
4. Remove the silicone gaskets (5).
5. Remove the shaft (4).
6. Remove the disc (3) of the PTFE ring (7).

### Recommended spare parts:

- PTFE sealing ring (7).
- O-ring set (6, 14 and 15).



6.1.2) Wafer and Lug type PTFE butterfly valves **DN40 to DN300** with PTFE disc.

**ASSEMBLY INSTRUCTIONS**

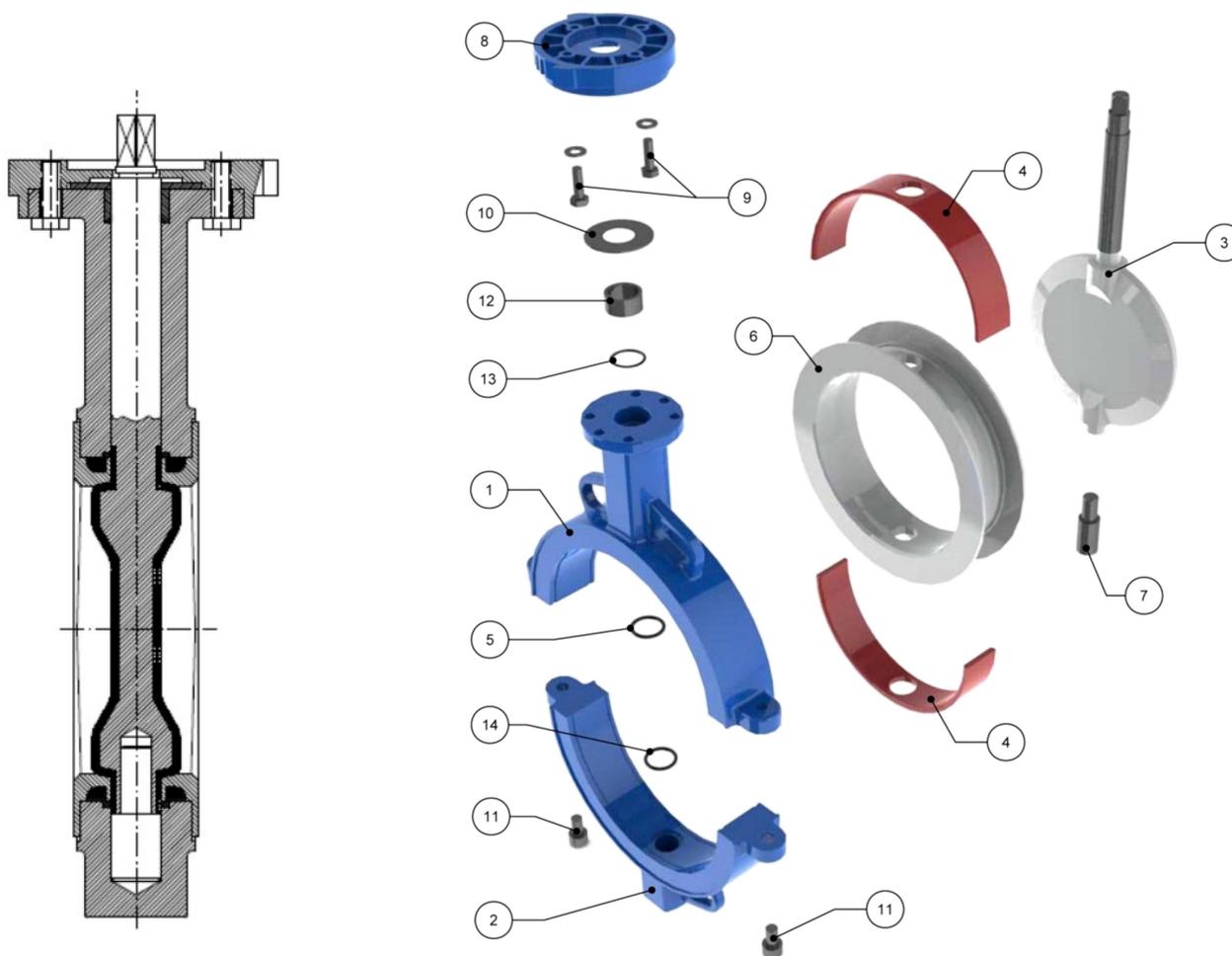
1. Place the bottom silicone gasket (4) over the ring (6).
2. Insert O-ring (14) over the ring (6).
3. Insert the lower shaft (7) in the lower body housing (2).
4. Fit the lower part of body (2).
5. Place the top silicone gasket (4) over the ring (6).
6. Insert the O-ring (5) through the shaft-disc kit (3) until we reach the ring (6).
7. Fit the upper part of body (1).
8. Screw together the two halves of body through the lug union (11).
9. Insert the O-ring (13) in the upper part of body housing (1) through the shaft (3).
10. Insert the bushing (12).
11. Insert the washer (10).
12. Place the flange (8) on top of the head of valve and tighten it with screws (9).

**DISASSEMBLY INSTRUCTIONS**

1. Unscrew (9) and remove the flange (8) from the top of the head of valve.
2. Unscrew (11) and remove the two halves of body (1 and 2).
3. Remove the lower shaft (7).
4. Remove the silicone gaskets (4).
5. Remove the shaft-disc-ring kit (3)+(6) and substitute it.
6. Remove the o-ring set (5, 13 and 14) and substitute them.

**Recommended spare parts:**

- PTFE sealing ring (6) *Note: (3)+(6) is an indivisible kit.*
- O-ring set (5, 13 and 14).



## 7. STORAGE INSTRUCTIONS

The aim of these specifications is the appropriate preservation and storage of TTV valves.

- Temperature:  
It shall be less than 25 °C.
- Humidity:  
It has to be avoided. There must not be condensations.
- Light:  
The valves have to be protected against sun light and ultraviolet rays.
- Oxygen and Ozone:  
The valves must be protected from air in circulation and against ozone.
- Deformation:  
They must be stored avoiding any deformation.
- Contact with metals  
The liner's parts must not be in contact with copper or manganese.
- Contact with liquids:  
They must be kept away from solvents, grease, oil, acid...
- Contact with dusty materials:  
They must be free from talcum powder, ceramic products...
- Rotation of stored products:  
The older ones have to be used first.
- Cleaning:  
If it is necessary to clean the valves, do not use abrasive products, hydrocarbons, etc.