
MANUAL OF WORKING INSTRUCTIONS, ASSEMBLING, MAINTENANCE AND STORAGE



METAL/METAL BUTTERFLY VALVES

INSTRUCTIONS MANUAL

- For BUTTERFLY VALVES Model METAL-METAL
- Range: DN 32 up to DN 1600

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1. GENERAL

This instructions manual contains important information with respect to the installation, operation, maintenance and storage of TTV butterfly valves.

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

It is important that only informed and well prepared personnel operate the valves.

2. WARNINGS

- Make sure that the valves are used within the limits stated in the technical specifications.
- Using the valves above the temperature limits can damage the internal and external components.
- Using the valves above the pressure limits can damage the internal and external components.
- Using the valves in corrosive environments without the proper protection and without a suitable selection of materials, can damage the internal and external components.
- Do not try to disassemble any part of the valve meanwhile the valve is mounted in the pipe. Do not do it either meanwhile there is any fluid inside the pipe.
- Drain the whole installation, ensuring that there is no air trapped inside, in the case that the fluid is a liquid.
- Do not disassemble the stem meanwhile the valve is mounted in the pipe; the disc would be pulled due to the pressure of the fluid, along the pipe.
- Make sure, whether an actuator is to be assembled, about the direction of the rotation of the valve (there are stops clearly marked and opening & closing icons of the disc at 90°).
- The studs for fastening the valve to the pipe shall be complete when the holes are through-holes in wafer and flanged types.
- In the case of lug type, the fastening shall be with bolts to both sides of the flanges.
- For the assembly of the metal-metal valves to the pipe, it is necessary to place suitable gaskets for the service and temperature, between valve faces and pipe flanges.

3. WORKING CONDITIONS AND TECHNICAL INFORMATION

– Fluids:

The valves are supplied for using them both for gas or liquids.

It is the customer responsibility (or the engineering that leads the project) to decide the most suitable materials for the required service, just like the assessment of the risks in the installation.

– Working pressure:

The valves are supplied to work at a maximum pressure of 30 bar in the body.

These valves are not designed to work with pressure when closing, as they are not tight.

The tightness can be considered to be about 99% approximately.

– Working temperature:

The supplied standard valves are comprised in the range $-10\text{ }^{\circ}\text{C}$ up to $+350\text{ }^{\circ}\text{C}$.

– Room temperature:

The supplied standard valves are designed to work in any room temperature.

– Operating time:

The valves are supplied with top flange for actuation according ISO 5211.

The operating time will be according the type of actuation installed.

– Travel:

The standard construction has a travel of rotation from 0° to 90° and from 90° to 0° .

– Lubrication:

The TTV metal/metal valves do not have lubrication.

– Construction:

Transmission of the movement by means of grailed stems and discs. The concentricity between the body and the disc is guaranteed through the set screw.

– Protection and resistance to corrosion:

All the standard valves are supplied with corrosion protection for ordinary environments.

For that purpose, the valves are treated according a process of anticaloric paint.

Before installing the valves in aggressive environments, ensure that the appropriate protection has been selected.

– Labelling and denomination of the valves:

The type of valve, size, design pressure, maximum working pressure, reference,... are indicated in the denomination of the valve.

The supplied TTV valves are labelled with the following information: Anagram of TTV, type, model, actuation, design pressure, maximum pressure, manufacturing order, date and EC marking.

4. OPERATION AND DIRECTION OF ROTATION

The operation of the valve to close it, is done moving the stem in clockwise direction and to open it, anticlockwise.

The regulation of the valve is achieved by means of the actuation, which the most common are:

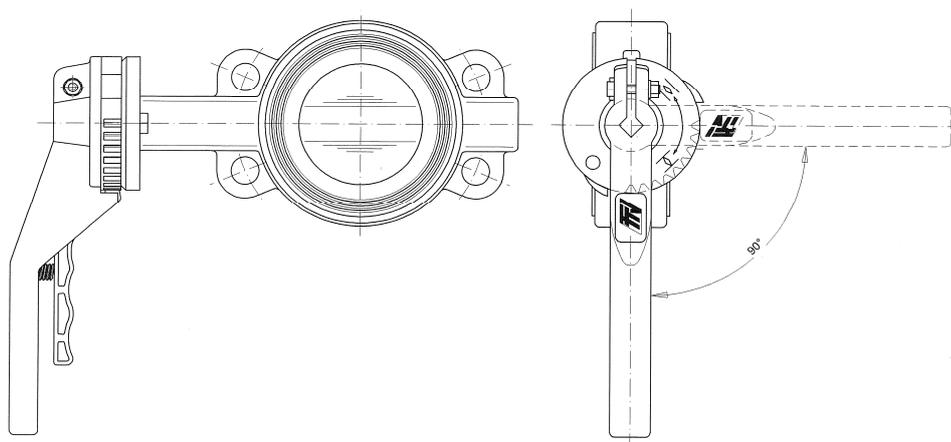
a) manual actuator with lever

The regulation is done by means of the notch flange and the lever's latch.

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

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

See figure A



b) manual actuator with gear box

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

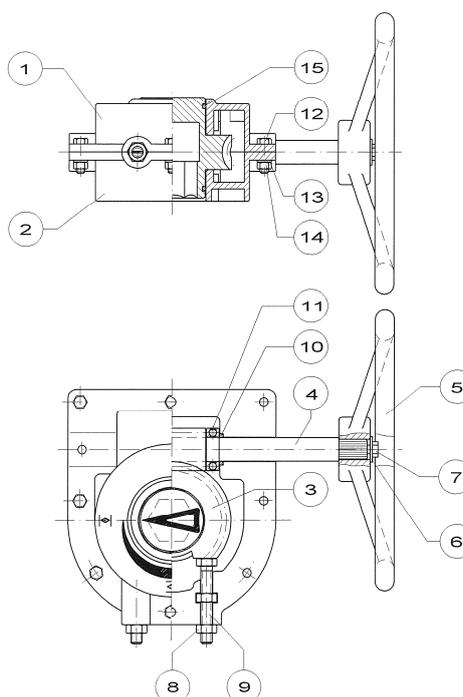
The movement is regulated by the bolts (position 9).

For this purpose, the nut is loosened (position 8) and the bolt is introduced or taken out depending on how open or close 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 quadrant and the opening / closing icons of the gearbox.

There is no need to dismount any piece of the gearbox for this purpose.

See figure B



c) pneumatic actuator

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

d) actuator with electric actuator

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

e) other actuators

Idem to the previous one.

5. ASSEMBLY INSTRUCTIONS

5.1) Assembly of wafer and flanged valves (metal/metal)

The valves are usually supplied ready for its assembly in the installation.

Once checked that there is enough room to put the valve, it is placed aligned with the pipe. Then, some studs are fixed in order to relate the valve in line with the pipe.

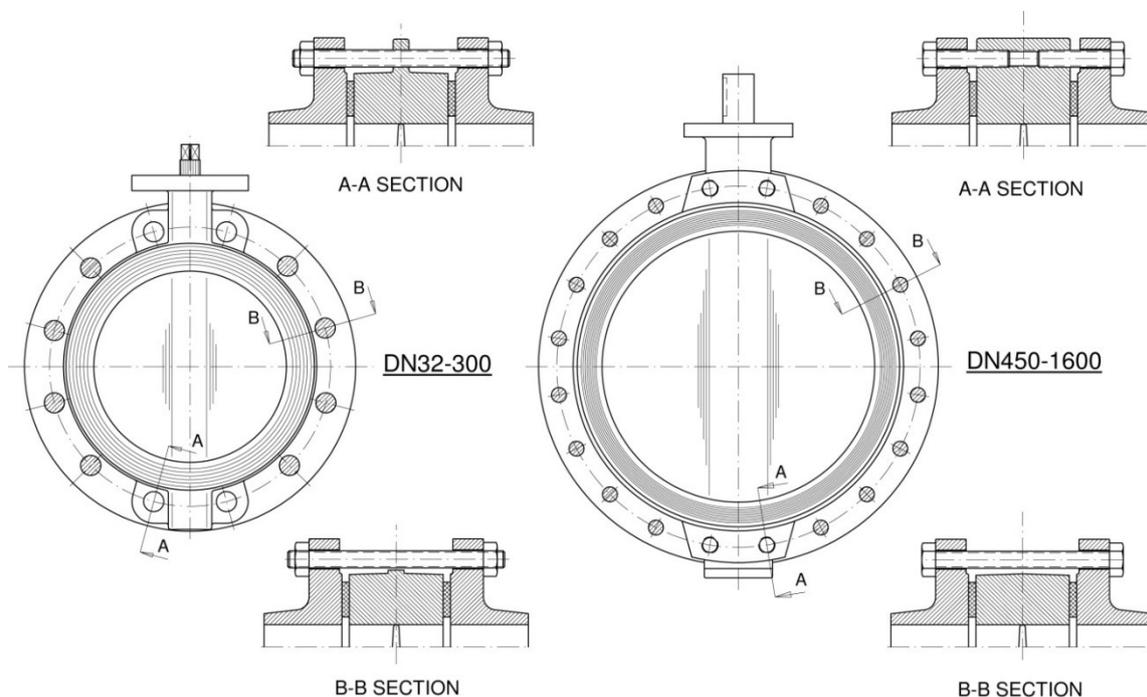
Next, the disc is fully opened at 90° and it is checked that there is not any problem of operating, and the rest of studs and nuts are fixed.

Last, all the nuts are tightened by triangulation in order to leave the bolting uniformly tightened and avoid deformations in the gasket joints to the pipe.

Finally, it is checked that the valve can be opened and closed with normality.

ATTENTION (ONLY APPLICABLE TO FLANGED TYPE):

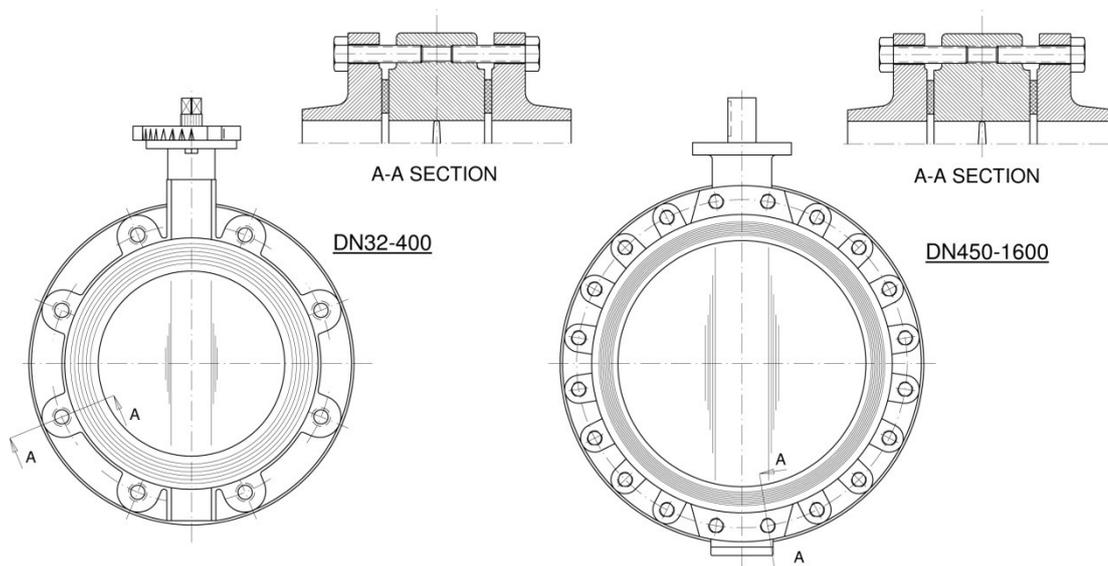
IT IS FORBIDDEN TO USE BOLTS WITH NUT TO FIX THE VALVE'S FLANGES TO THE PIPE'S FLANGES, THIS SHALL BE DONE WITH COMPLETE THROUGH-STUDS AND NUTS.



5.2) Assembly of lug valve (metal to metal)

Similar to the previous ones.

The valves have to be assembled with bolts long enough to allow the perfect tighten between the flanges of the pipe. Such bolts won't be longer than the required.



5.3) Assembly position

TTV recommends that the valves from DN450 and above are assembled with the stem of the valve in horizontal position.

As the valves are bi-directional, they can be assembled by any side. It is not necessary to keep the fluid's direction.

ASSEMBLY WARNINGS

- The valves shall be free of dirt.
- The room to place the valve shall be wide enough to allow the valve and its two gaskets to be assembled.
- Try not to scrape or hit the valve during the assembly; it could damage the paint and create future corrosions.
- Ensure that in the case of heavy valves' assembly, the lifting eyebolt and cargo slings fulfill the safety homologations that were applicable.

6. MAINTENANCE INSTRUCTIONS

The TTV valves need little maintenance. However, due to the likely high working requirements, the following maintenance actions shall be performed whether it is required.

The assembly and disassembly of the valve is only permitted to personnel from TTV or any other properly prepared. In case these warnings are not observed, the guarantee will not have any validity.

Description and recommended spare pieces:

6.1.- For valves that work at temperatures <180 °C, follow the standard process for valves with elastomer (see the corresponding instructions).

6.2.- For wafer, lug and flanged types DN 32 to DN 200 (>180 °C):

Remove the actuator and the top flange (pos 8) loosening the bolts (pos 9).

Remove the threaded bushing (pos 5) that pushes the packing (pos 4).

Loose the bolt (pos 7) that fastens the disc (pos 2) to the stem (pos 3).

Remove the stem and pull out the disc.

Afterwards, the packing is changed by a new one.

Assemble all the components in the inverse way to the detailed above.



6.3.- For wafer, lug and flanged types DN 250 to DN 400 (>180 °C):

Proceed identically to the previous section but considering that it is not necessary to remove the top flange (pos 8) as there is not any.

Recommended spare pieces: packing (pos 4).

6.4.- For wafer, lug and flanged types DN 450 to DN 1600 (>180 °C):

Remove the actuation and the bolts (pos 7 & 9), removing the caps aswell (pos 6 and 12).

Remove the bushings (pos 5 & 10).

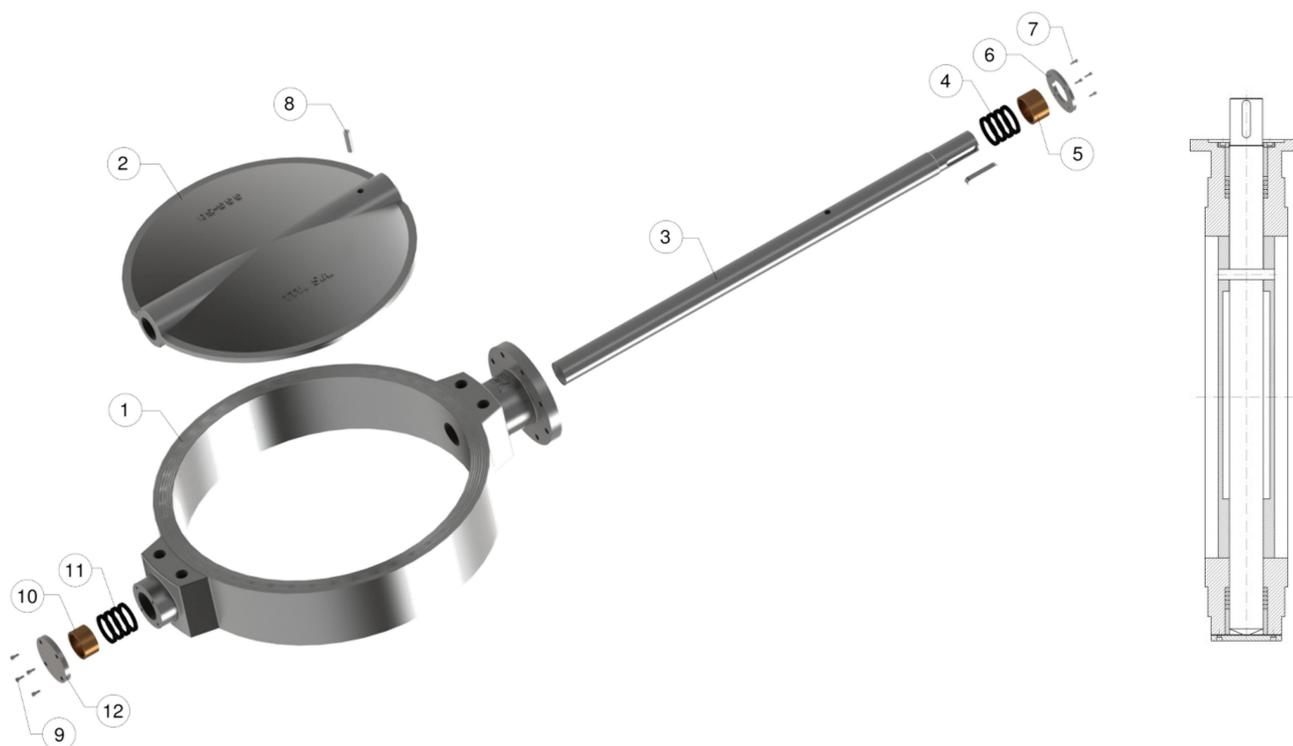
Loose the bolt (pos 8) that fastens the disc (pos 2) to the stem (pos 3).

In this moment the stem is free to be removed with the help of a puller placed in the threaded part of the stem in the actuation area.

Afterwards the disc is removed.

The packing (pos 4 and 11 is removed).

Assemble all the components in the inverse way to the detailed above.



Attention: Due to the size, weight and complexity of the assembly and disassembly, we suggest that this process is carried out in TTV.

Recommended spare pieces: packing (pos 4 & 11).

7. STORAGE INSTRUCTIONS

These specifications have as a purpose the proper preservation and storage of the TTV valves.

- Temperature: not applicable.
- Humidity: it shall be avoided, condensations are not allowed.
- Light: not applicable.
- Oxigen and Ozone: not applicable.
- Deformation: not applicable.
- Contact with metals: not applicable.
- Contact with liquid products: the valves shall be far from acids, acid gases, etc.
- Contact with dusty materials: not applicable.
- Rotation of stored products: not applicable.