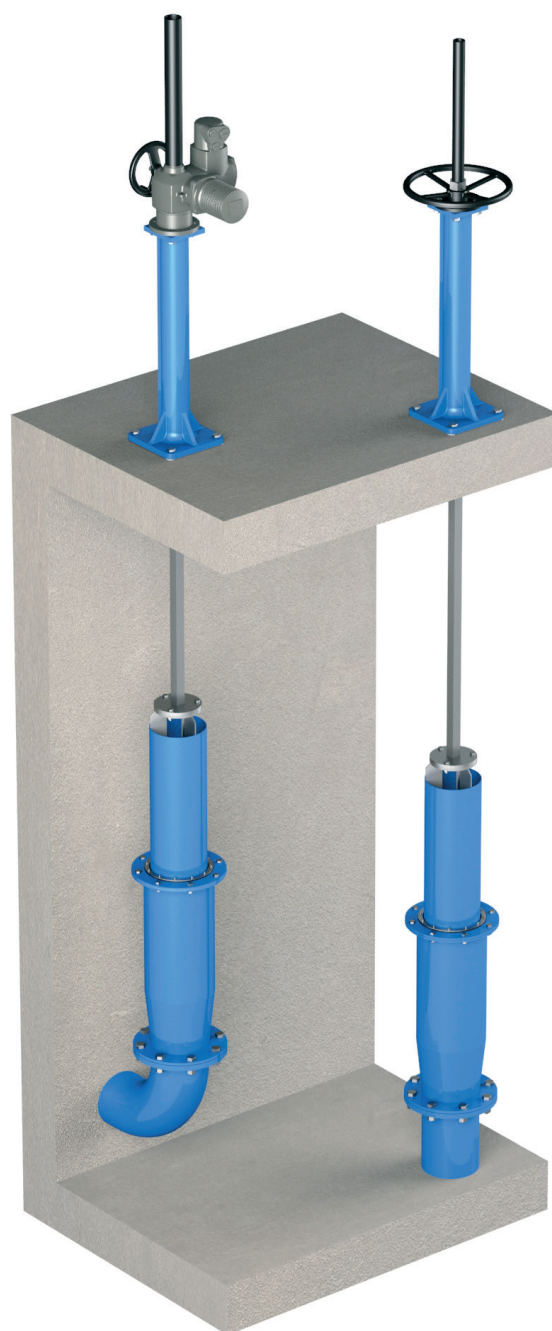


TE



INSTRUCTIONS AND MAINTENANCE MANUAL



INSTRUCTIONS AND MAINTENANCE MANUAL

ASSEMBLY

APPLICATION OF EUROPEAN DIRECTIVES

See document of European Directives applicable to **CMO Valves**.



The **TE** valve complies with the Directive on Equipment and Protective Systems for Potentially Explosive Atmospheres. In these cases the logo will appear on the identification label. This label shows the exact classification of the zone in which the valve can be used. The user is responsible for its use in any other zone.

HANDLING

Pay special attention to the following points when handling the equipment:

- **SAFETY WARNING:** Before handling the valve, check that the crane to be used is capable of withstanding its weight.
- Do not lift the valve or hold it by the actuator. Lifting the valve by the actuator could lead to operating problems as it is not designed to withstand the valve's weight.
- When lifting the valve, take care not to damage the seals, as this may lead to valve operation problems.
- To prevent damage, especially to the anti-corrosive protection, we recommend using soft straps to lift **CMO Valves**. telescopic valves. These straps must be fitted to the bottom of the seal flange, around the body.
- If the equipment is packed in wooden boxes, these must be provided with clearly marked holding areas where the slings will be placed when securing them. In the event that two or more valves are packed together, separation and securing elements must be provided between them to prevent possible movements, knocks and friction during transport. When storing two or more valves in the same box, you must ensure they are correctly supported to prevent loss of shape. In the case of dispatch by sea we recommend the use of vacuum bags inside the boxes to protect the equipment from contact with sea water.
- Pay special attention to maintaining the correct levelling of the valves during loading and unloading as well as during transport to prevent deformations in the equipment. For this purpose we recommend the use of mounts or stands.



INSTALLATION

In order to avoid personal injury and other types of damage (to the facilities, the valve, etc.), we recommend following these instructions:

- The staff responsible for the installation or operation of the equipment must be qualified and trained.
- Use suitable Personal Protective Equipment (PPE) (gloves, safety boots, goggles, etc.).
- Shut off all lines that affect the valve and put up a warning sign to inform about the work being performed.
- Completely isolate the valve from the whole process. Empty the chamber.
- Drain all the fluid from the chamber.
- Use non-electric hand tools during installation and maintenance, in accordance with current regulations.



Before installation, inspect the valve to ensure no damage has occurred during transport or storage. Ensure that the outside surface of the obturator is clean, as this is where closing takes place. Inspect the joint flange of the pipe in the installation to ensure it coincides with the attachment flange of the obturator of the telescopic valve, and that both of them are sufficiently clean.

ASPECTS TO BE CONSIDERED DURING ASSEMBLY

Since these **TE** valves are used to regulate the level of fluid of a pond, they are mounted in upright position with the obturator positioned in the top section. The movement of the obturator is linear, meaning the level of fluid in the pond is increased by raising the obturator, extracting it from the body until the upper opening is positioned at the required height level. On the other hand, when the obturator is introduced in the body, the opening comes down and all the fluid above this level is discharged through the inside of the obturator.

The other fundamental element of the valve is the body, which is a pipe with diameter slightly larger than the obturator casing, and a fastening flange on the bottom section. This flange is used to mount the telescopic valve in the facility. For this reason, an essential requirement in order to mount this type of valve is that the pond must have a pipe finished with a flange where the valve can be mounted. It should be remembered that all the fluid above the required level will be discharged through this pipe.

ADVANTAGE

ASPECTS TO BE CONSIDERED DURING ASSEMBLY

The recommended assembly sequence is as follows:

- It is first necessary to inspect the pond to make sure it has a flanged pipe to mount the valve, ensuring that this coincides with the fastening flange boring of the telescopic valve (fig. 1).
- Check that the flanges in both the installation and the valve are clean, and proceed with assembly.
- Position a seal between the two flanges to ensure the watertight integrity of the joint, and bolt them (fig. 2).
- Bolt the flanges with light initial torque. Then tighten diagonally with the final torque applicable in accordance with the corresponding standard.
- Since **CMO Valves** supplies the **TE** valves pre-assembled at factory (body + obturator + seals), the valve is almost fully mounted at this point (fig. 3). All that is required to finish assembly is the valve actuator system.
- This actuator system acts on the obturator and must be perfectly aligned with it.
- Whenever the pond where the telescopic valve is installed is undercover, there must be an orifice level at valve level in order for the actuator rod to pass through. If this is not the case, make a through-hole with the dimensions indicated in the diagram.
- No obstante también existe la posibilidad que el depósito sea abierto y no disponga de techo. En este caso habrá que montar un soporte escuadra sobre una pared lateral, de tal manera que se pueda montar el sistema de accionamiento sobre el soporte y quede debidamente alineado con la válvula.

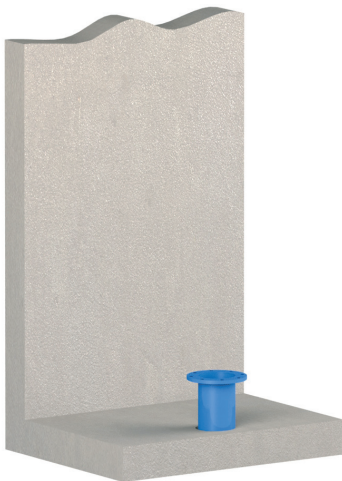


Fig. 1



Fig. 2



Fig. 3

- However, there is also the possibility that the pond is not undercover and does not have a roof. In this case, it is necessary to install a bracket on a sidewall, in order to mount the actuator system and ensure it is duly aligned with the valve.
- The most commonly used actuator systems in this type of valve are wheel (with or without gearbox) and motorised. They are all based on the same principle, meaning the assembly processes similar.
- The first step will be to release the actuator system stem (7). In the case of manual actuator, either with direct wheel or with gearbox, first remove the bolted stopper (15) from the top of the stem (7).
- In order to unscrew the stem (7) from the actuator, turn the wheel (11) clockwise to release the stem (7).
- Once the stem is released (7), introduce the top section through the orifice in the roof or the bracket.
- Continue to position the bottom bushing of the stem (7) on the obturator (2) and bolt crosswise with appropriate torque (fig. 4).
- At this point it is only necessary to mount the actuator system in its location.
- When choosing the floor stand system, first position the stem non-turn plate (13), introducing it in the stem and supported on the ground (fig. 5).

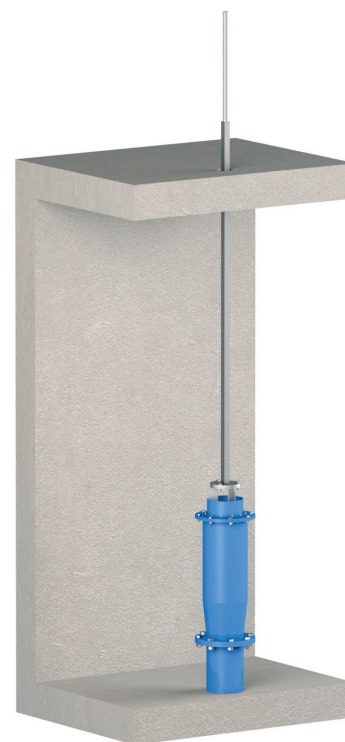


Fig. 4

- Continue to position the actuator system on the stem (7). To do this, position the actuator on the stem (7) and turn the wheel (11) anti- clockwise to screw the actuator nut on the stem (7).
- Continue turning the wheel (11) anti- clockwise until the floor stand is supported along with the actuator system on the stem non-turn plate (13) placed on the floor (fig. 6).
- Anchor the actuator system to the floor using expansion anchors. In the case of manual actuator, bolt the stopper (15) in the top part of the stem (7).
- Carry out several operations without load (fig. 7), checking the correct operation of the valve and, in the case of motorised actuator, also adjust the limit switches.
- Fill the pond and check that the telescopic valve does not have any leaks and the level can be regulated satisfactorily.



Fig. 5



Fig. 6



Fig. 7

The following points must be taken into account after installing the valve:

- The equipment must be firmly secured in the installation.
- The outside surface of the obturator must be completely free of any residue, since closing takes place on this surface.
- As regards scaffolding, ladders and other auxiliary elements to be used during assembly, follow the safety recommendations indicated by the manufacturers or suppliers.
- Once the equipment has been assembled, ensure that there are no elements which impede the movement of the obturator.
- Make the relevant connections (electrical, pneumatic, hydraulic) in the equipment's actuator system following the instructions and wiring diagrams supplied with it.
- The assembly of the equipment must be coordinated with the site's control and safety staff and no modifications are permitted in the equipment's external indication elements (limit switches, positioners, etc.).
- When operating the equipment, follow the safety recommendations indicated in this dossier.

Once the valve has been installed, check that all the nuts and bolts have been correctly tightened and that the whole valve actuator system has been properly adjusted (electrical connections, pneumatic connections, instrumentation, etc.).

All **CMO Valves** valves are tested at its facilities, although the valve may have become damaged during transport or assembly. Once the valve is installed, it is very important to check that this works correctly and that there is no leak when fluid load is applied.



Once the valve is in place, check the electrical or pneumatic connections. If the valve has electrical accessories or you are in an ATEX zone, earth connections must be made before operating it.

If you are in an ATEX zone, check the continuity between the different elements of the valve (EN 12266- 2, annex B, points B.2.2.2. and B.2.3.1.). Check the earth connection of the valve.

ACTUATOR

The most common actuator system in these **TE** telescopic valves is electrical or manual. As mentioned several times throughout this document, these valves are designed for each specific project; if you require any type of specific actuator not envisaged in this manual, check with **CMO Valves**'s Technical and Sales Department.

Some possible types of actuator and their most significant characteristics are detailed below:

HANDWHEEL

In order to operate the valve: turn the wheel clockwise to reduce the level of fluid in the pond (draining through the valve), or turn the wheel anti-clockwise for the pond to contain more fluid. It is possible to stop the handwheel from turning at any degree of opening of the valve; the obturator will maintain its position since the actuator is self-locking.

PNEUMATIC

CMO Valves's hydraulic actuators are designed to be connected to a pneumatic grid of a minimum of 6 bar and a maximum of 10 bar.

The pressurised air used for the pneumatic actuator must be dry and correctly filtered and greased.

This type of actuator does not require any adjustment, due to the fact that the pneumatic cylinder is designed for the exact stroke required by the valve.

HYDRAULIC

CMO Valves's hydraulic actuators are designed to work at a standard pressure of 135 bar (other pressures can be used in accordance with needs).

This type of actuator does not require any adjustment, due to the fact that the hydraulic cylinder is designed for the exact stroke required by the valve.

MOTORISED

If the valve is fitted with a motorised actuator, the instructions of the supplier of the electric actuator will be included.



Manual actuators (wheel, gears, etc.) should not be subjected to excessive force (maximum 25 Kg). Exerting excessive force may result in irreparable damage to the equipment.

Motorised actuators must have torque limiters and limit switches in order to prevent damage to the equipment..

Fig. 8



WHEEL ACTUATOR WITH
RISING STEM



PNEUMATIC
ACTUATOR



ELECTRIC-MOTOR
ACTUATOR

MAINTENANCE

CMO Valves will not be liable if the valves suffer any damage due to improper handling or without proper authorisation. The valves should not be modified unless expressly authorised by **CMO Valves**. The following instructions should be followed in order to avoid personal injury or material damage when carrying out maintenance tasks:



- The staff responsible for the maintenance or operation of the equipment must be qualified and trained.
- Use suitable Personal Protective Equipment (PPE) (gloves, safety boots, goggles, etc.).
- Shut off all lines which affect the valve and put up a warning sign to inform about the work being carried out.
- Completely isolate the valve from the whole process. Empty the chamber.
- Drain all the fluid from the chamber.
- Use non-electric hand tools during maintenance, in according to current regulations.

The maintenance required for this type of valve is to change the gasket. It is recommended to regularly check this element every 6 months, however its working life will depend on the valve's working conditions, such as: temperature, number of operations, type of fluid and others. Both the bolts and the flanges used to secure this element are stainless steel, meaning they can be reused several times.

In an ATEX zone, electrostatic charges may be present inside the valve, which can cause a risk of explosion. The user will be responsible for carrying out the appropriate actions in order to minimise the risks.



The maintenance staff must be informed about the risks of explosion and ATEX training is recommended.

Regular cleaning of the valve to prevent accumulation of dust. Avoid re-painting the products supplied.

LUBRICATION



It is recommended to lubricate the stem twice a year by removing the protection cap and filling it with grease up to half its volume.

After maintenance in an ATEX zone, it is necessary to check the electrical continuity between the different parts of the valve, such as the body, obturator, stem, etc. (Standard EN 12266-2, Annex B, points B.2.2.2. and B.2.3.1.).

IMPORTANT SAFETY ASPECTS

- In order to work under ideal safety conditions, the magnetic and electrical elements must be in idle mode and the air tanks depressurised. Moreover, the electrical control cabinets must also be out of service. The maintenance staff must be up to date with the safety regulations and work can only start under orders from the site's safety staff.
- The safety areas must be clearly marked, avoiding the use of auxiliary equipment (ladders, scaffolding, etc.) in levers or moving parts, in order to produce the movement of the obturator.
- In equipment with electrical actuator, it is recommended to disconnect it from the mains in order to access the mobile parts without any risk.
- Given its importance, you must check that the valve's shaft has no load before disassembling the actuator system.

Taking into account the recommendations indicated, the maintenance operations recommended for this type of equipment are shown below:

REPLACING THE GASKET

1. The complete absence of fluid in the pond is recommended. The fluid must be at least 20 centimetres underneath the flange of the body (1) where the gasket is housed (6).
2. Position the valve completely open, with the obturator (2) at the very bottom (fig. 9).
3. Release and remove the bolts which secure the seal support flange (5) with the flange of the body (1) (fig. 10).
4. Bring the seal support flange (5) up along with the gasket (6) and its attachment flanges (3), separating it from the body (1) (fig. 11).
5. Once in place above the obturator flange (2), release and remove the bolts from the fastening flanges (3) of the gasket (fig. 12).
6. As the gasket (6) is not fastened, remove it from the seal support flange (5) and clean the housing for the new seal (6) to be correctly seated.
7. Position a new gasket (6) on the support flange (5), with the same dimensions as the one removed, ensuring that the two ends seal perfectly together.
8. Bolt the two attachment flanges (3) on the gasket (6).
9. Bring down the support flange (5) with the seal (6) and its flanges (3) until it is in its original location, i.e. on the flange of the body (1).
10. Ensure that the seal (4) between the two flanges is in a good state and free of any residue.
11. Bolt the seal support flange (5) crosswise on the body (1).
12. Once the gasket has been replaced (6), it is recommended to carry out several operations without load in order to check the valve works properly.

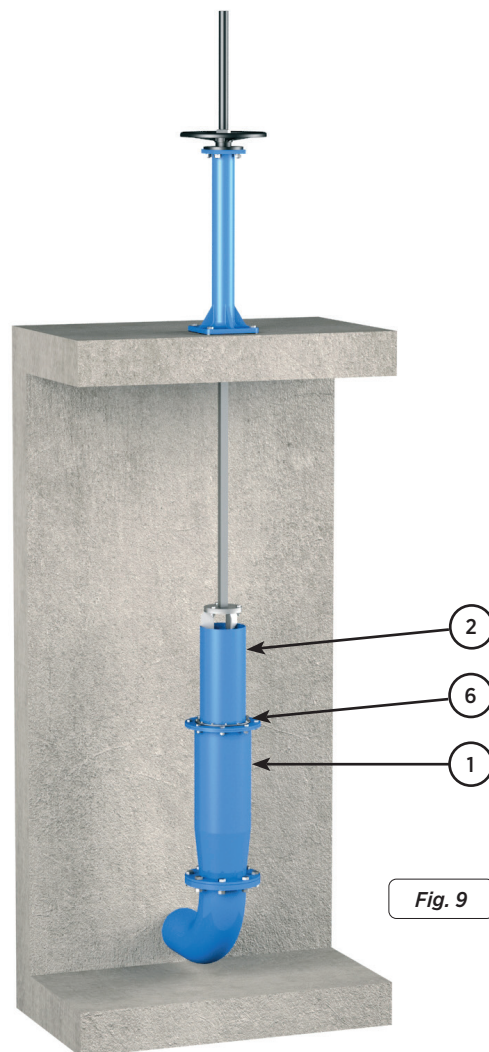


Fig. 9

Fill the pond, checking that the telescopic valve does not have any leaks and the level of the chamber can be regulated.

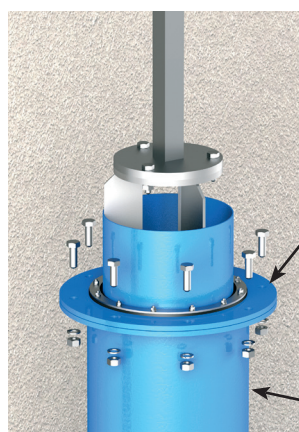


Fig. 10

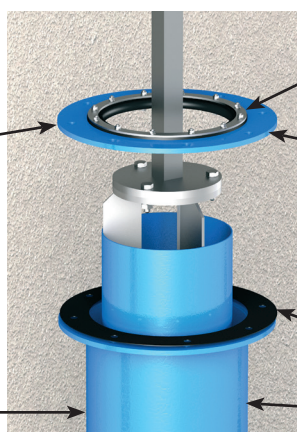


Fig. 11

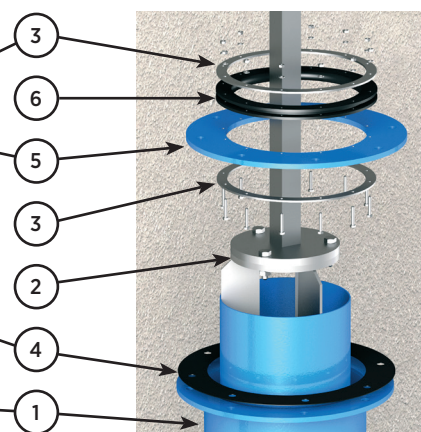


Fig. 12

***Note:** During the aforementioned maintenance work, it is recommended to apply petroleum jelly to the gasket to facilitate the assembly process and the correct operation of the valve (do not use oil or grease); table 1 below shows details of the petroleum jelly used by **CMO Valves**:

WHITE PETROLEUM JELLY

Saybolt Colour	ASTM D-156	15
Melting point (°C)	ASTM D-127	60
Viscosity at 100°C	ASTM D-1445	5
Penetration 25°C mm./ 10	ASTM D-1937	165
Silicone content	None	
Pharmacopea BP	OK	

Table. 1

MAINTENANCE OF THE PNEUMATIC ACTUATOR

The pneumatic cylinders in our valves are manufactured and assembled at our premises. The maintenance of these cylinders is simple, if your need to replace any elements and you have any questions please consult **CMO Valves**. Below is an exploded diagram of the pneumatic actuator (fig 13) and a list of the cylinder's components (table 2). The top cover and the support cover are usually made of aluminium, but from pneumatic cylinders greater than Ø200 mm, they are made of cast ductile iron.

The maintenance kit normally includes: The socket and its joints and the scraper, and if the customer wishes the piston is also supplied. Below we show the steps to follow to replace these parts.

1. Position the valve in closed position and shut off the pneumatic circuit pressure.
2. Loosen the cylinder air input connections.
3. Release and remove the cylinder cap (5), the cylinder tube (4) and the tie rods (16).
4. Loosen the nut (14) which connects the piston (3) and the rod (1), remove the parts. Disassemble the cir-clip (10) and remove socket (7) with its joints (8 & 9).
5. Release and remove the cylinder head (2), in order to remove the scraper (6).
6. Replace the damaged parts with new ones and assemble the actuator in the opposite order to that described for the disassembly.

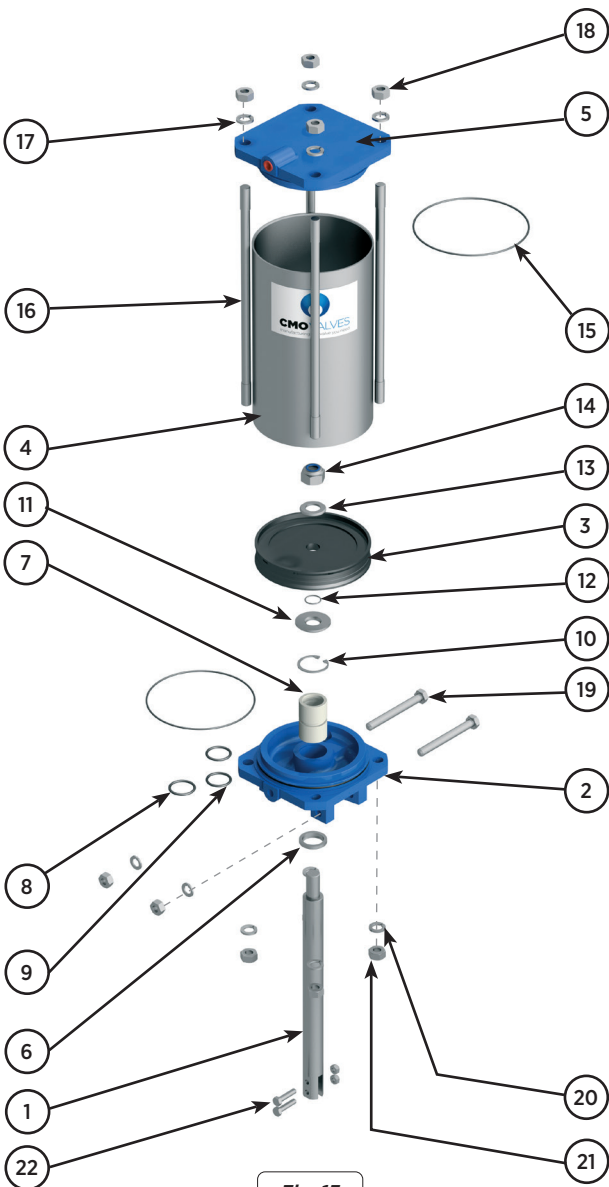


Fig. 13

PNEUMATIC ACTUATOR		
POS.	DESCRIPTION	MATERIAL
1	STEM	AISI-304
2	COVER SUPPORT	ALUMINIUM
3	PISTON	S275JR + EPDM
4	CASING	ALUMINIUM
5	UPPER COVER	ALUMINIUM
6	SCRAPER	NITRILE
7	SOCKET	AP6
8	EXTERIOR O-RING	NITRILE
9	INTERIOR O-RING	NITRILE
10	CIR-CLIP	STEEL
11	WASHER	ST ZINC
12	O-RING	NITRILE
13	WASHER	ST ZINC
14	SELF-LOCKING NUT	5.6 ZINC
15	O-RING	NITRILE
16	TIES	F-114 ZINC
17	WASHER	ST ZINC
18	NUT	5.6 ZINC
19	SCREW	5.6 ZINC
20	WASHER	ST ZINC
21	NUT	5.6 ZINC
22	SCREW	A-2

Table. 2

STORAGE

To ensure the valve is in optimum conditions of use after long periods of storage, we recommend storing it in a well-ventilated place at temperatures below 30°C.

Whilst not advised, if stored outside, the valve must be covered to protect it from heat and direct sunlight, with good ventilation to prevent humidity.

The following aspects must be considered for storage purposes:

- The storage place must be dry and under cover.
- It is not recommended to store the equipment outdoors with direct exposure to adverse weather conditions, such as rain, wind, etc. Even when the equipment is packaged.
- This recommendation is even more important in areas with high humidity and saline environments. Wind can carry dust and particles which can come into contact with the valve's mobile parts and this can lead to operating difficulties. The actuator system can also be damaged due to the introduction of particles in the different elements.
- The equipment must be stored on a flat surface to avoid loss of shape.
- If the equipment is stored without suitable packaging it is important to keep the valve's mobile parts lubricated, for this reason it is recommended to carry out regular checks and lubrication.
- Likewise, if there are any machined surfaces without surface protection, it is important for some form of protection to be applied to prevent the appearance of corrosion.

COMPONENTS LIST

LIST OF COMPONENTS

POS.	DESCRIPTION
1	BODY
2	OBTURATOR
3	SEAL ATTACHMENT FLANGE
4	FLANGE SEAL
5	SEAL SUPPORT FLANGE
6	GASKET
7	STEM
8	FLOOR STAND
9	ACTUATOR NUT
10	YOKE
11	HANDWHEEL
12	CAP
13	STEM NON-TURN PLATE
14	NUT SUPPORT
15	CAP NUT

Table. 3

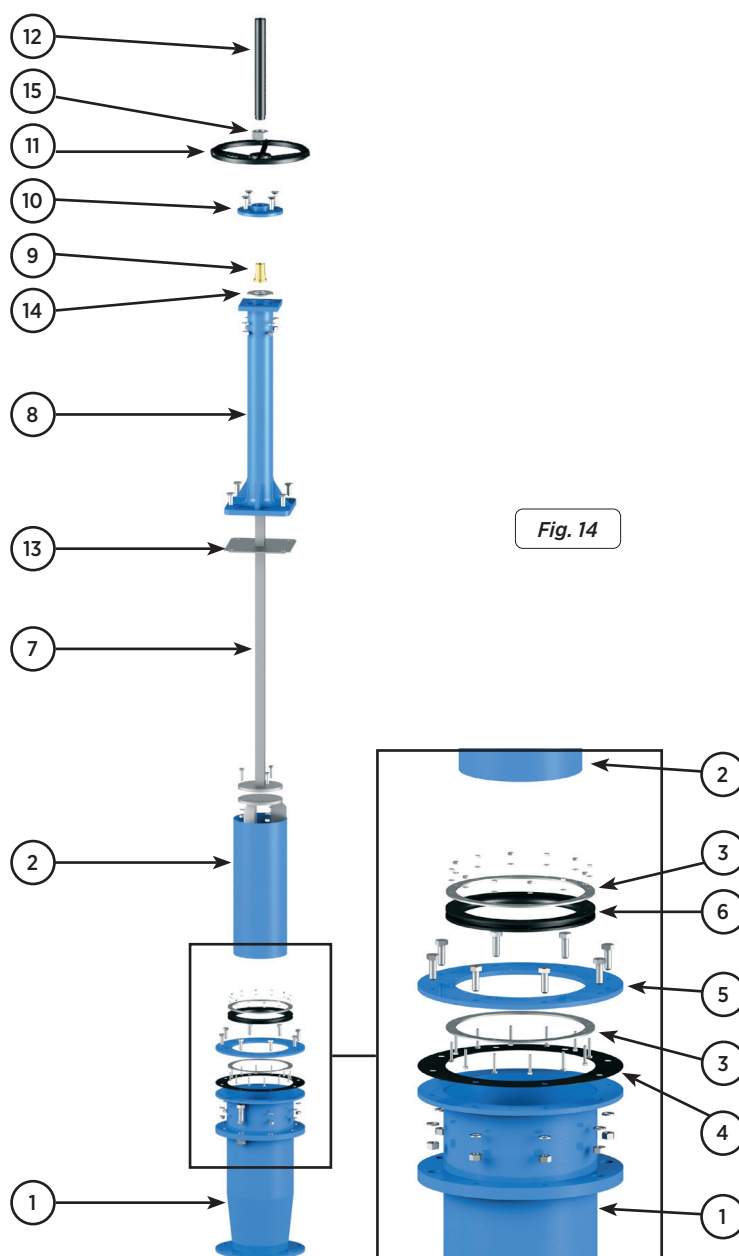


Fig. 14



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