XB

CMO VALVES

Rev.0 / 07-10-2022

INSTRUCTIONS AND MAINTENANCE MANUAL

INSTRUCTIONS AND MAINTENANCE MANUAL

ASSEMBLY

APPLICATION OF EUROPEAN DIRECTIVES

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

The **XB valve** complies with the Directive on Equipment and Protective Systems for Use in Explosive Atmospheres. In these cases the logo will appear on the identification label. This label shows the exact classification of the zone where 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:

- Using soft straps to lift **CMO Valves** knife gate valves is recommended in order to prevent any damage, especially to the anticorrosive protection. These straps must be fitted to the top of the valve, around its body.
- Do not lift the valve or hold it by the drive. Lifting the valve by the actuator can lead to operating problems as it is not designed to withstand the valve's weight.
- Do not lift the valve or hold it by the flow passage area. The valve's sealing joint is located in this area. If the valve is held and lifted by this area, it can damage the surface and the sealing joint and lead to leakage problems while the valve is operating.
- **SAFETY WARNING:** Before handling the valve, check that the crane to be used is capable of withstanding its weight.
- Packing in wooden boxes: 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. If two or more valves are packed together, separation and securing elements must be provided between them to prevent possible movements, bangs and friction during transport. When storing two or more valves in the same box, ensure they are correctly supported to prevent any deformations. For dispatches by sea, we recommend using 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 loss of shape in the equipment. We therefore recommend using mounts or stands.

INSTALLATION

In order to avoid personal injury and other types of damage (to property, the plant, etc.), we recommend the following:

- All personnel responsible for handling and maintaining the equipment must be qualified and trained in operations with this type of equipment.
- Use appropriate personal protection (gloves, safety boots, goggles, hardhat, high-visibility vest, etc.).
- Shut off all operating lines that affect the valve and put up a warning sign.
- Completely isolate the valve from the whole process.
- Depressurise the process.
- Drain all the line fluid through the valve.
- Use hand tools rather than electric tools during installation and maintenance, in according to current regulations.

ADVANTAGE

ASPECTS TO BE CONSIDERED DURING ASSEMBLY

Before installation, inspect the valve body and components for any damage during transport or storage.

Make sure the valve body's inside cavities are clean. Inspect the pipes and the flanges to make sure they contain no foreign material and are clean.

Being bidirectional, the **XB valve** does not need any marking indicating flow direction and can be installed in either direction (fig. 1).

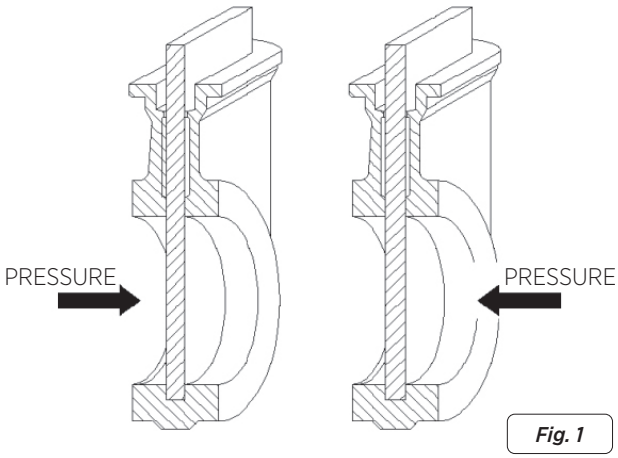

Fig. 1

Fluid and pressure directions do not always coincide, although with bidirectional valves this has no effect when assembling the valve, as its operation will be the same (Fig. 2).

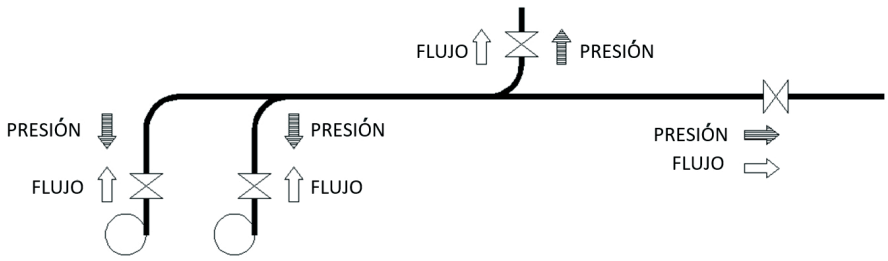

Fig. 2

Special care must be taken to maintain the correct distance (gap) between the flanges and ensure they are correctly aligned and parallel (Fig. 3).
Any incorrect position or installation of the flanges can cause deformations in the valve's body which can cause difficulties during operation.

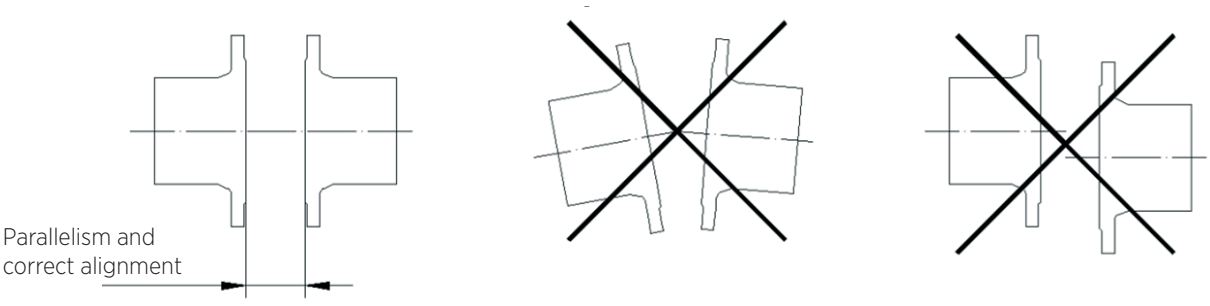

Fig. 3

It is very important to make sure that the valve is correctly aligned and parallel to the flanges in order to prevent leakages and avoid deformations.
The bolts in the threaded blind holes will have a maximum depth and will never reach the bottom of the hole.

ASSEMBLY POSITIONS (horizontal pipe)

In horizontal pipes, installing **CMO Valves** in vertical position is recommended, although other assembly positions are also possible.

Position number 1: The recommended position

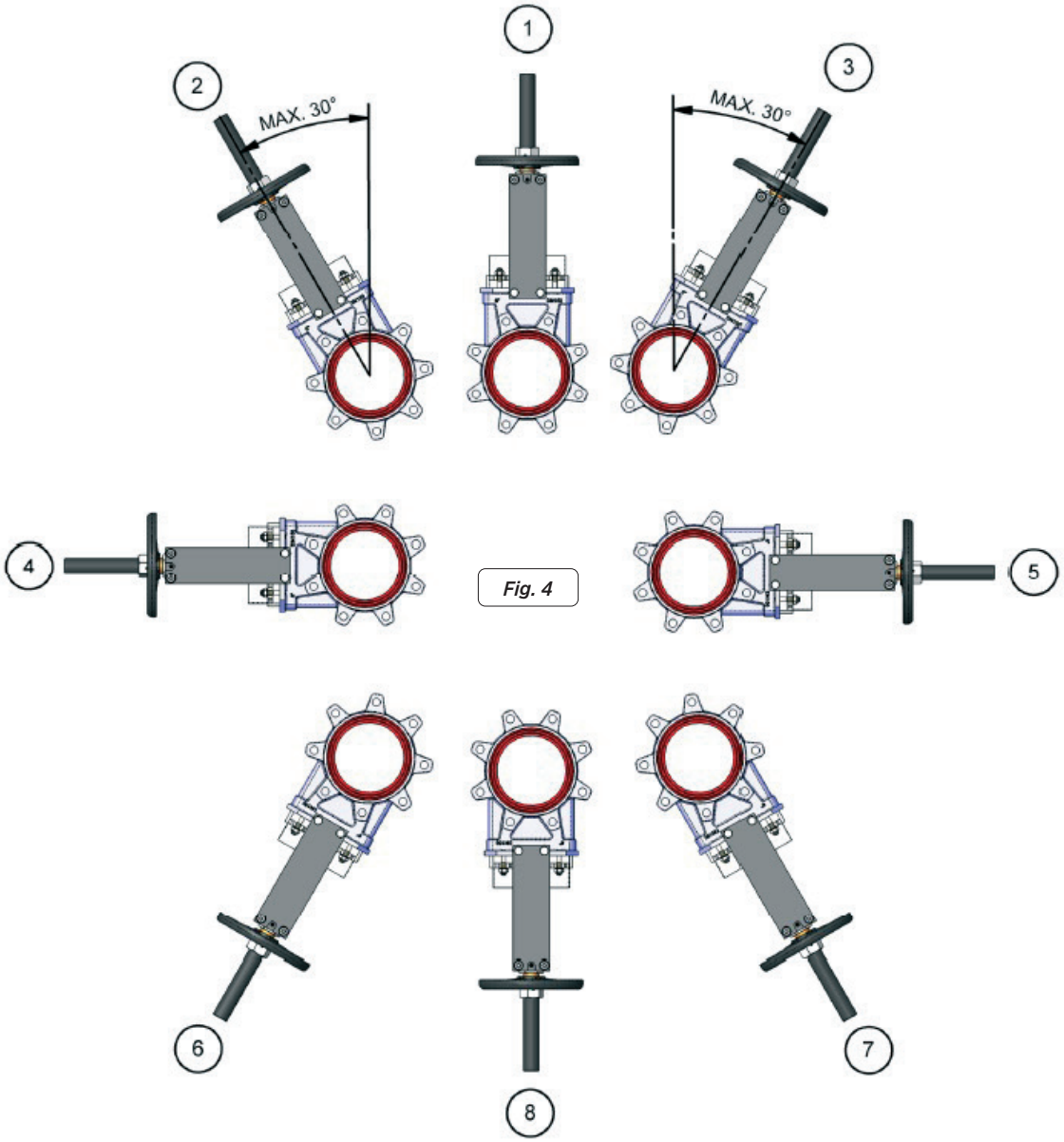

Fig. 4

Position number 8: The valve can be installed in this position, although contacting **CMO Valves** is recommended in such cases.

Positions 2, 3, 6 and 7: For large valves (over DN300), the maximum angle permitted with the installation vertical is 30°. For smaller sizes, the angle can be increased up to 90º (positions 4 and 5).

Please check with **CMO** whenever large valves are to be installed in any of these positions, as in these cases, given the weight of the actuator, suitable support must be provided in order to prevent deformations and operating problems in the valves.

Positions 4 and 5: For smaller sized valves, the valves can be installed in these positions.
To install larger valves (over DN300) in any of these positions, please contact **CMO Valves**.

Given the weight of the actuator, in these cases suitable support should be provided in order to prevent any loss of shape and operating problems in the valves.

ASSEMBLY POSITIONS (vertical/leaning pipe)

CMO Valves can be assembled in all positions; however, certain aspects must be taken into account:

Positions numbers 1, 2, and 3: Suitable support should be provided in these positions, since the weight of the actuator may lead to loss of shape, resulting in valve operation problems.

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

All **CMO Valves** are tested at its facilities, although the bolts used to tighten the packing gland may come loose during handling and transport and have to be re-tightened.

Once the valve is installed in the pipe and has been pressurised, it is very important to check for any leakages from the packing gland to the outside.

In the event of a leakage, tighten the packing gland bolts crosswise until the leakage stops, making sure there is no contact between the packing gland and the knife gate.

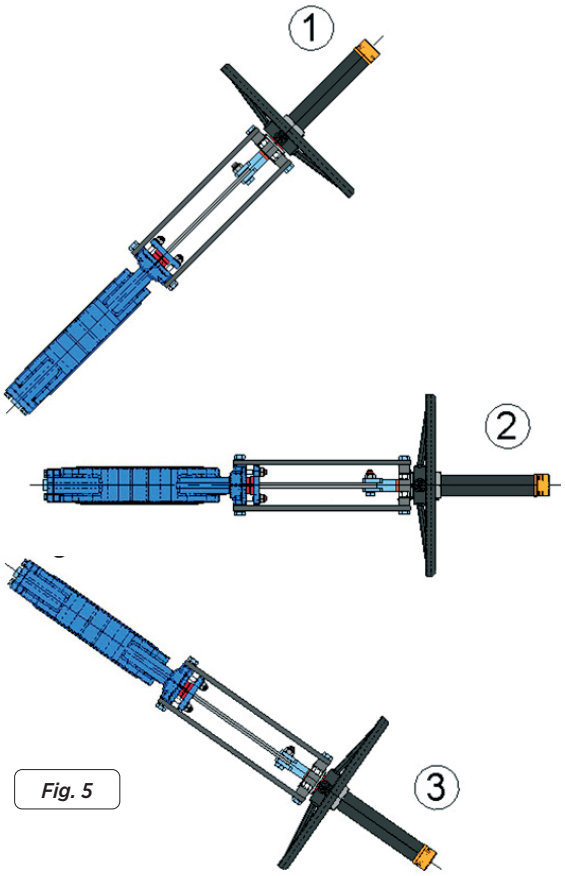

Fig. 5

Once the valve is in place, check that the flanges and electrical and pneumatic connections are secure. If electrical connections are present or you are in an ATEX zone, earth connections must be made before starting.

In an ATEX zone, check the continuity between the valve and the pipe (EN 12266-2, annex B, points B.2.2.2. and B.2.3.1.). Check the pipe's earth connection and the conductivity between the outlet and inlet pipes.

DRIVE

HANDWHEEL

To operate the valve: the handwheel can be turned clockwise (close) or anticlockwise (open).

CHAIN HANDWHEEL (rising and non-rising stem)

To operate the valve, pull one of the chain's vertical drops downwards to lock it to the other one, taking into account that opening is clockwise.

GEAR-BOX

To operate the valve: the handwheel can be turned clockwise (close) or anticlockwise (open).

PNEUMATIC, HYDRAULIC

This actuator can be operated manually (via pushbuttons) and automatically (via various sensors, detectors, timers, etc).

MOTORISED

This actuator can also be operated manually or automatically; each type of drive will have its own instructions.

H/A = RISING STEM
H/NA = NON-RISING STEM

HANDWHEEL RISING STEM **H/A**

HANDWHEEL NON-RISING STEM **H/NA**

CHAIN HANDWHEEL **H/A** **H/NA**

HANDWHEEL GEAR-BOX **H/A** **H/NA**

PNEUMATIC ACTUATOR **H/A**

ELECTRIC-MOTOR ACTUSTOR **H/A** **H/NA**

HYDRAULIC ACTUATOR **H/A**

Fig. 6

MAINTENANCE

In order to prevent personal injury and other types of damage (in the plant, etc.), we recommend the following:

- The person responsible for installing, operating and maintaining the valves must be qualified and trained in the operation of similar valves.
- Appropriate personal protection must be used (gloves, safety boots, goggles, hardhat, etc.).
- Shut off all operating lines to the valve and put up a warning sign.
- Completely isolate the valve from the process.
- Fully depressurise the process.
- Drain all the line fluid through the valve.
- Use hand tools rather than electric tools during installation and maintenance, in accordance with regulations in force.

In an ATEX zone, electrostatic charges may be present inside the valve, which can cause explosions. The user is responsible for minimising the risks.

- Personnel must consider the risks of explosion, and ATEX training is recommended.
- If the fluid transported constitutes an internal explosive atmosphere, the user must regularly check the installation's tightness.
- Regular cleaning of the valve to prevent accumulation of dust.
- Assemblies are not permitted at the end of the line.
- Avoid painting the products supplied.

The only maintenance required for this type of valve is periodic inspections of the rubber seat gasket (liner) and packing.

Sealing joints should be checked every 6 months, although their working life will depend on the working conditions of the valve, such as pressure, temperature, number of operations, fluid composition, among others.
It should be noted that the sealing joint is permanently attached to the body in this type of compact design valves. This sealing joint must therefore be replaced by renewing the body.

GREASING

It is recommended to lubricate the stem twice a year by removing the cap from the bonnet and filling it with grease up to half its volume.
Electrical continuity between the pipeline and the rest of the components must be checked once maintenance is complete in an ATEX zone. EN 12266-2, annex B, points B.2.2.2. and B.2.3.1.)

REPLACING THE PACKING (Fig. 7)

1. Make sure there is absolutely no pressure and fluid in the facility.
2. Place the valve in open position.
3. Loosen the bolts that connect the stem or spindle to the knife gate. (2)
4. Loosen the connection between the support plate (6) and the body (1).
5. Release and remove the packing gland (3) and the safety guards where present.
6. Remove the damaged packing (4) and (5) using a pointed tool, taking care not to damage the surface of the knife gate (2).
7. Carefully clean the packing and make sure there are no metal parts inside.
8. Insert the new packing (4) and (5). During this operation it is very important for both ends to be perfectly joined. The packing dimensions are shown below (Table 1).

As standard, packing in **CMO Valves** is made up of 2 lines (1 packing line and 1 rubber joint line in the middle).

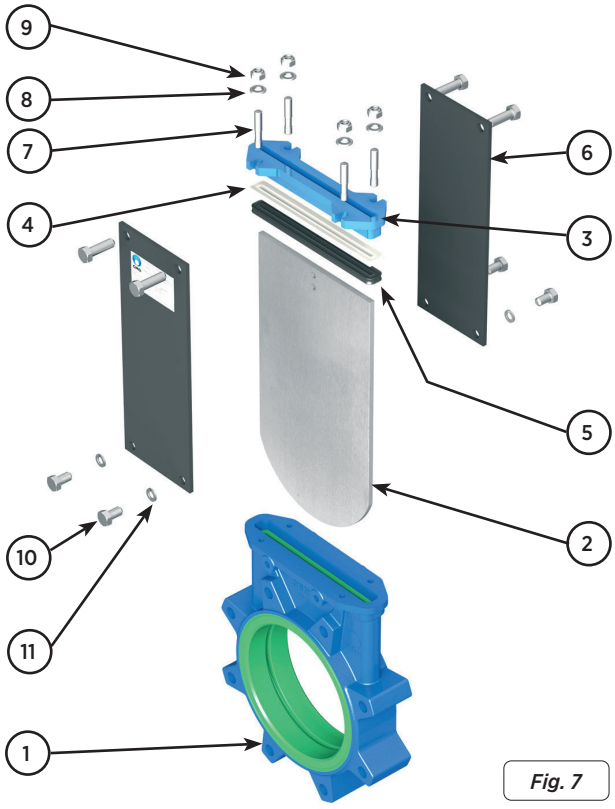

Fig. 7

***Note:** If it is not possible to place a rubber joint in the middle, another packing line should be used instead.

DIAMETER	PACKING	RUBBER RING
DN50	1 line 8 x 8 x 204	1 line 8 x 8 x 204
DN65	1 line 8 x 8 x 234	1 line 8 x 8 x 234
DN80	1 line 8 x 8 x 264	1 line 8 x 8 x 264
DN100	1 line 8 x 8 x 304	1 line 8 x 8 x 304
DN125	1 line 8 x 8 x 356	1 line 8 x 8 x 356
DN150	1 line 8 x 8 x 406	1 line 8 x 8 x 406
DN200	1 line 8 x 8 x 516	1 line 8 x 8 x 516
DN250	1 line 10 x 10 x 636	1 line 10 x 10 x 636
DN300	1 line 10 x 10 x 740	1 line 10 x 10 x 740
DN350	1 line 10 x 10 x 810	1 line 10 x 10 x 810
DN400	1 line 10 x 10 x 928	1 line 10 x 10 x 928
DN450	1 line 10 x 10 x 1028	1 line 10 x 10 x 1028
DN500	1 line 14 x 14 x 1144	1 line 14 x 14 x 1144
DN600	1 line 14 x 14 x 1346	1 line 14 x 14 x 1346

Table. 1

***Note:** Dimensions are shown in millimetres.

9. Place the packing gland (3) in its original position, ensuring it does not touch the knife gate, carefully tighten all the bolts crosswise and make sure the same distance is left between the knife gate and the packing gland on both sides.
10. Mount the plates (6) and the drive by inserting the bolts that connect the stem or spindle to the knife gate (2).
11. Slowly carry out an operation, stopping if it seizes up. If this occurs, the packing gland has not been aligned correctly.
12. Pressurise the valve in the line and tighten the packing gland crosswise, enough to prevent leakages to the outside.

PNEUMATIC DRIVE MAINTENANCE

The pneumatic cylinders in our valves are manufactured and assembled at our premises. Maintenance for these cylinders is straightforward; if you need to replace any elements or have any questions, please ask **CMO Valves**. Below is an exploded diagram of the pneumatic drive and a list of the cylinder's components. The top and mount covers are usually made of aluminium, although pneumatic cylinders over Ø200 mm are made of ductile cast iron.

The maintenance kit normally includes the bushing and its seals and the scraper, and the piston is also supplied if the customer so wishes. The steps to follow when replacing these parts are shown below.

1. Position the valve in closed position and shut off the pneumatic circuit pressure.
2. Release the cylinder air input connections.
3. Release and remove the top bonnet (5), casing (4) and rods (16).
4. Loosen the nut (14) that connects the piston (3) and the spindle (1), and remove the pieces. Disassemble the cir-clip (10) and remove the bushing (7) with its joints (8, 9).
5. Release and remove the mount cover (2), in order to remove the scraper (6).
6. Replace the damaged parts with new ones and assemble the drive in reverse order to that described for disassembly.

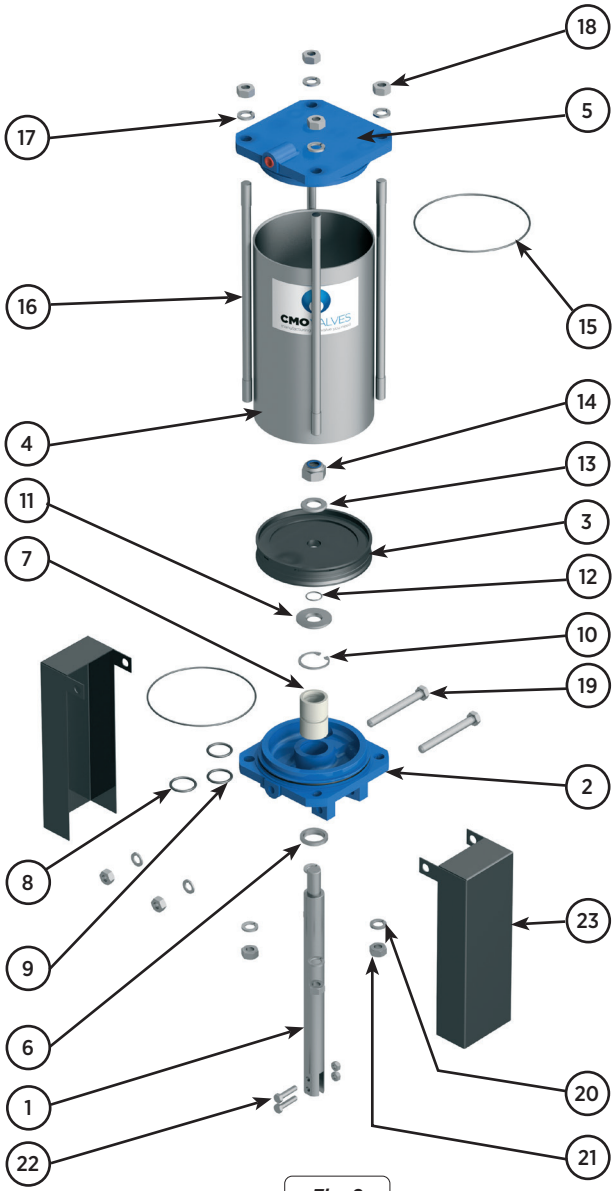

Fig. 8

PNEUMATIC DRIVE		
POS.	DESCRIPTION	MATERIAL
1	SPINDLE	AISI-304
2	MOUNT COVER	ALUMINIUM
3	PISTON	S275JR + EPDM
4	CASING	ALUMINIUM
5	TOP BONNET	ALUMINIUM
6	SCRAPER	NITRILE
7	BUSHING	NYLON
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	RODS	F-114 ZINC
17	WASHER	ST ZINC
18	NUT	5.6 ZINC
19	BOLT	5.6 ZINC
20	WASHER	ST ZINC
21	NUT	5.6 ZINC
22	BOLT	A-2
23	PROTECTION	S275JR

Table. 2

STORAGE

To ensure the valve is in optimum conditions of use after long periods of storage, it should be stored in a well-ventilated place at temperatures below 30ºC.
Although not advisable, 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 covered.
- Storing the equipment outdoors with direct exposure to adverse weather conditions, such as rain, wind, etc., is not recommended. 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 drive 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 any 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

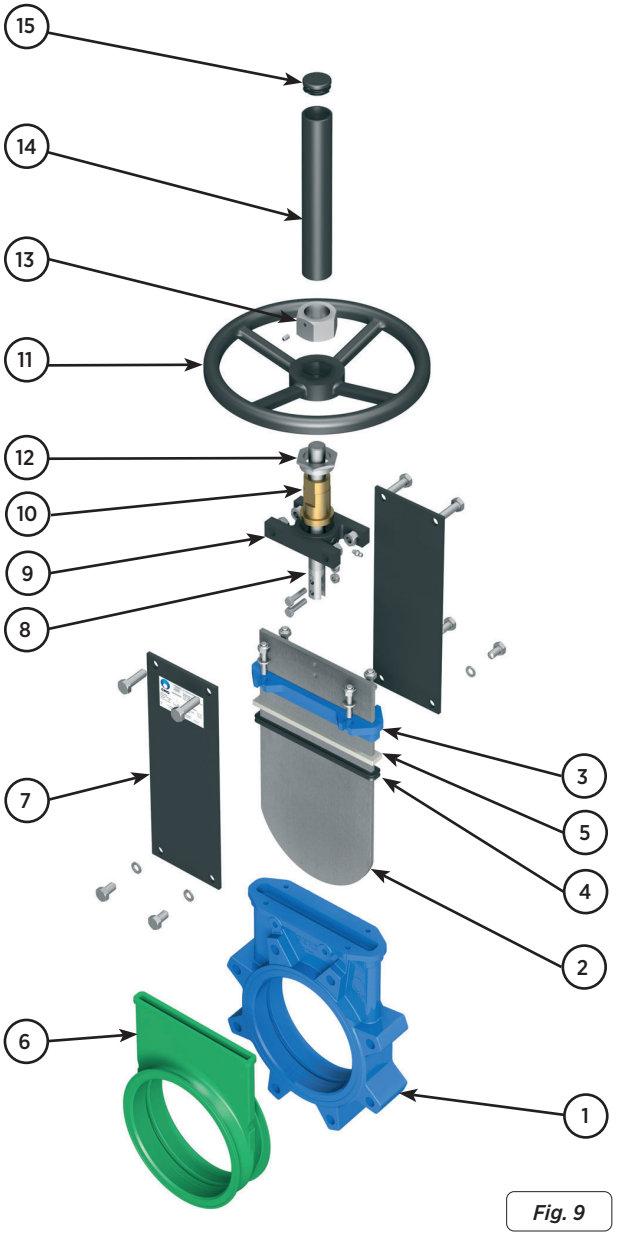

Fig. 9

HANDWHEEL DRIVE	
POS.	DESCRIPTION
1	BODY
2	KNIFE GATE
3	PACKING GLAND
4	SEALING JOINT
5	PACKING
6	LINER
7	SUPPORT PLATES
8	STEM
9	YOKE
10	STEM NUT
11	HANDWHEEL
12	STOPPER NUT
13	BONNET NUT
14	BONNET
15	BONNET CAP

Table. 3

www.cmovalves.com

CMO VALVES

QMS CERTIFIED BY LRQA
Approval number ISO9001 0035593

CMO VALVES
HEADQUARTERS MAIN OFFICES & FACTORY

Amategi Aldea, 142
20400 Tolosa
Gipuzkoa (Spain)

Tel.: (+34) 943 67 33 99

cmo@cmovalves.com
www.cmovalves.com

CMO VALVES
MADRID

C/ Rumania, 5 - D5 (P.E. Inbisa)
28802 Alcalá de Henares
Madrid (Spain)

Tel.: (+34) 91 877 11 80

cmomadrid@cmovalves.com
www.cmovalves.com

CMO VALVES
FRANCE

5 chemin de la Brocardière
F-69570 DARDILLY
France

Tel.: (+33) 4 72 18 94 44

cmofrance@cmovalves.com
www.cmovalves.com