



CONSTRUCCIONES
METÁLICAS
DE OBTURACIÓN, S.L.

CMO



GESTION DE
LA CALIDAD
CERTIFICADA

QUALITY
MANAGEMENT
CERTIFIED

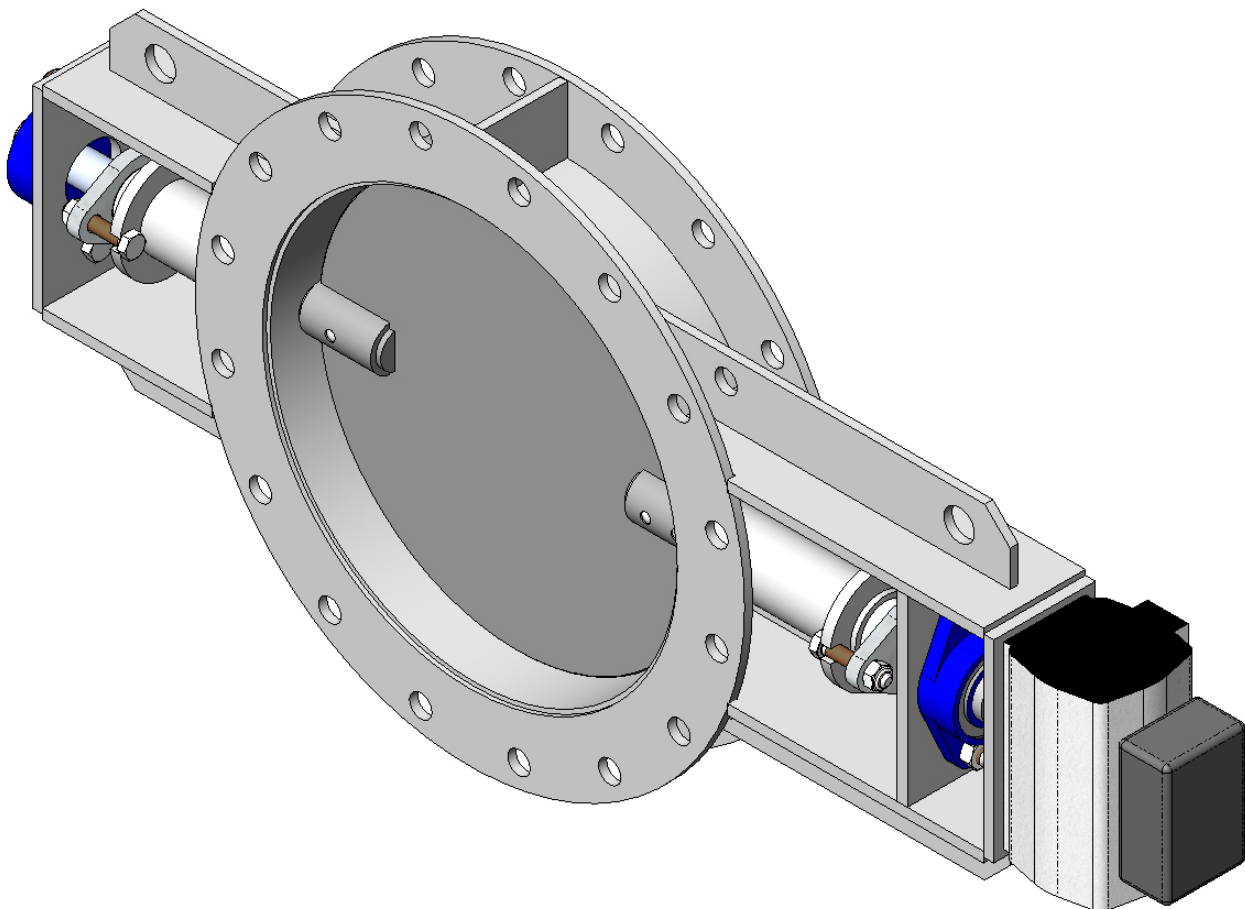
DAMPER BUTTERFLY

ML/MF SERIES

18/12/2015

INSTRUCTIONS AND MAINTENANCE MANUAL

SERIES: ML / MF



C.M.O.

Amategui Aldea 142, 20400 Txarama-Tolosa (SPAIN)

MAN-MF/ML.ES00

Tel. National: 902.40.80.50 Fax: 902.40.80.51 / Tel. International: 34.943.67.33.99 Fax: 34.943.67.24.40

cmo@cmo.es <http://www.cmo.es>

page 1



DAMPER BUTTERFLY

ML/MF SERIES

ASSEMBLY

THE ML AND MF DAMPER BUTTERFLIES COMPLY WITH:

Machinery Directive: **DIR 2006/42/EC (MACHINERY)**

Pressure Equipment Directive: **DIR 97/23/EC (PED) ART.3, P.3**

Explosive Atmospheres Directive (optional): **DIR 94/9/EC (ATEX) CAT.3 ZONE 2 and 22 GD.**

ML and **MF** damper butterflies may comply with the directive on protection systems and apparatus for use in explosive atmospheres. In these cases the logo will appear in the identification label. This label shows the exact classification of the zone in which the damper butterfly 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 damper butterfly, check that the crane to be used is capable of bearing its weight.
- Do not lift the valve or hold it by the actuator. Lifting the damper butterfly by the actuator can lead to operating problems as it is not designed to withstand the valve's weight.
- Do not lift the damper butterfly by holding it in the fluid passage area. If a sealing system is fitted, it is located in this area. In consequence, if the valve is lifted in this way, the sealing system and surface may be damaged, causing leakage problems during the operation of the damper butterfly.
- To prevent damage, especially to the anti-corrosive protection, we recommend using soft straps to lift **C.M.O.** valves. These straps should be secured using the orifices fitted in the valves for this purpose.
- 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. 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 damper butterflies in the same box, ensure they are correctly supported in order to prevent loss of shape. In the case of dispatches by sea we recommend the use of vacuum bags inside the wooden 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 damper butterflies, etc.), we recommend following these instructions:

- The personnel 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).

DAMPER BUTTERFLY

ML/MF SERIES



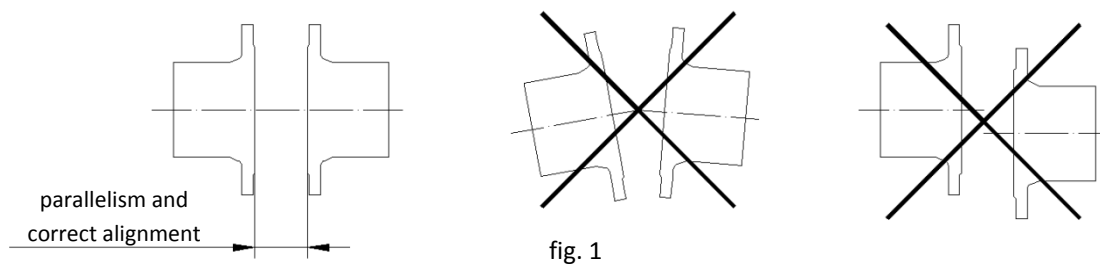
- Shut off all lines which affect the damper butterfly and put up a warning sign to inform about the work being carried out.
- Completely isolate the valve from the whole process. Depressurise the process.
- Drain all the line fluid through the damper butterfly.
- Use non-electrical hand tools during installation and maintenance, in accordance with **EN13463-1(15)**.

Before installation, inspect the damper butterfly to ensure no damage has occurred during transport or storage.

Make sure that the inside of the damper butterfly body and, in particular, the seal area are clean. Inspect the installation's pipes and flanges to make sure they are clean.

IMPORTANT ASPECTS TO CONSIDER DURING ASSEMBLY

- **ML** and **MF** damper butterflies are bidirectional and work in the same way in both directions, meaning the direction the valve is mounted in in the line is irrelevant.
- Special care must be taken to respect the correct distance between the flanges and ensure they are correctly aligned and parallel (fig. 1).
The incorrect position or installation of the flanges can cause loss of shape in the body of the damper butterfly and this could lead to operating problems.



It is very important to make sure that the damper butterfly is correctly aligned and parallel to the flanges 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. As indicated in the documentation of the **ML** and **MF** characteristics, these damper butterflies have numerous variables, and in consequence we recommend asking for further information.
- The equipment must be firmly installed in the conduit. The joint to the conduit can be bolted or welded.
 - Whenever the joint is bolted to the conduit, a watertight seal must be positioned between the conduit and the damper butterfly in order to prevent any possible leakages. The seal to be installed must be selected in line with the working conditions inside the conduit (temperature, pressure, fluid, etc). The bolts and nuts to be fitted must also be suitable for the operating conditions and their measurements must be in accordance with the approved plans. The bolts and nuts will be assembled diagonally. The torque to apply to the fastening bolts and nuts must be correct according to the applicable standard; we recommend the initial assembly should be carried out with a low tightening torque and, after all the bolts are in place, the final torque applied.
 - When the joint is welded to the conduit, great care must be taken when welding, as this may produce losses of shape in the damper butterfly due to the tensions created by the welding,

C.M.O.

Amategui Aldea 142, 20400 Txarama-Tolosa (SPAIN)

MAN-MF/ML.ES00

Tel. National: 902.40.80.50 Fax: 902.40.80.51 / Tel. International: 34.943.67.33.99 Fax: 34.943.67.24.40

cmo@cmo.es <http://www.cmo.es>

page 3

DAMPER BUTTERFLY

ML/MF SERIES

possibly leading to operation problems. For this reason it is vitally important to choose qualified personnel and the most suitable welding procedure in each case. Once the unit is positioned and levelled at the location for welding, we recommend first welding by sections in order to control the tensions created due to the welding process. To finish, carry out the continuous welding of the joint between the conduit and the damper butterfly.

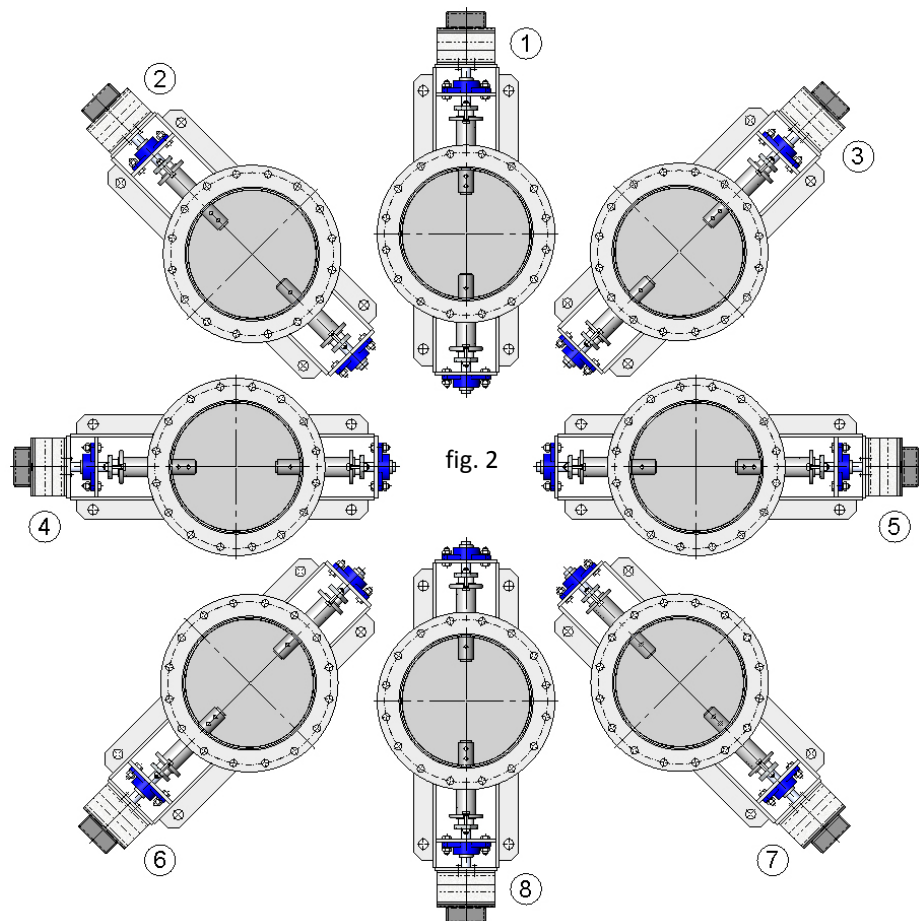
- As regards scaffolding, ladders and other auxiliary elements to be used during assembly, follow the safety recommendations indicated in this dossier.
- Once the equipment has been assembled, make sure that there are no elements, whether interior or exterior, which can interfere with the movement of swing check.
- Make the relevant connections (electrical, pneumatic, etc) in the equipment's drive system following the instructions and wiring diagrams supplied with it.
- The operation 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.).
- Follow the safety recommendations indicated in this dossier when operating the equipment.

ASSEMBLY POSITIONS (horizontal pipe, fig. 2)

C.M.O.'s ML and MF damper butterflies are designed for the rotation shaft to remain in horizontal position, although other assembly positions are also possible.

Positions numbers 4 and 5: C.M.O.'s damper butterflies are designed to work in these positions.

Positions numbers 1, 2, 3, 6, 7 and 8: The damper butterflies can be installed in these positions, although we suggest checking with C.M.O. as necessary. For these positions it is necessary to design the valve to work correctly. Given the weight of the actuator, in some cases it may be necessary to prepare suitable support to prevent loss of shape and operation problems in the damper butterflies.



C.M.O.

Amategui Aldea 142, 20400 Txarama-Tolosa (SPAIN)

MAN-MF/ML.ES00

Tel. National: 902.40.80.50 Fax: 902.40.80.51 / Tel. International: 34.943.67.33.99 Fax: 34.943.67.24.40

cmo@cmo.es <http://www.cmo.es>

page 4

DAMPER BUTTERFLY

ML/MF SERIES

ASSEMBLY POSITIONS (vertical/slanting pipe, fig. 3)

C.M.O.'s damper butterflies are designed for problem-free assembly in vertical or slanting pipes, although certain aspects must be taken into account:

Positions numbers 1, 2, and 3: One of the most important characteristics, which must be strictly adhered to, is that the rotation shaft should be in horizontal position.

Moreover, given the weight of the actuator, in some cases it may be necessary to prepare suitable support to prevent loss of shape and operation problems in the valve.

For this reason, we recommend checking with C.M.O. as necessary in order to assemble the damper butterfly in any of these positions.

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

All C.M.O. valves are tested at its facilities, however, during handling and transport the packing gland nuts can come loose and must be re-tightened.

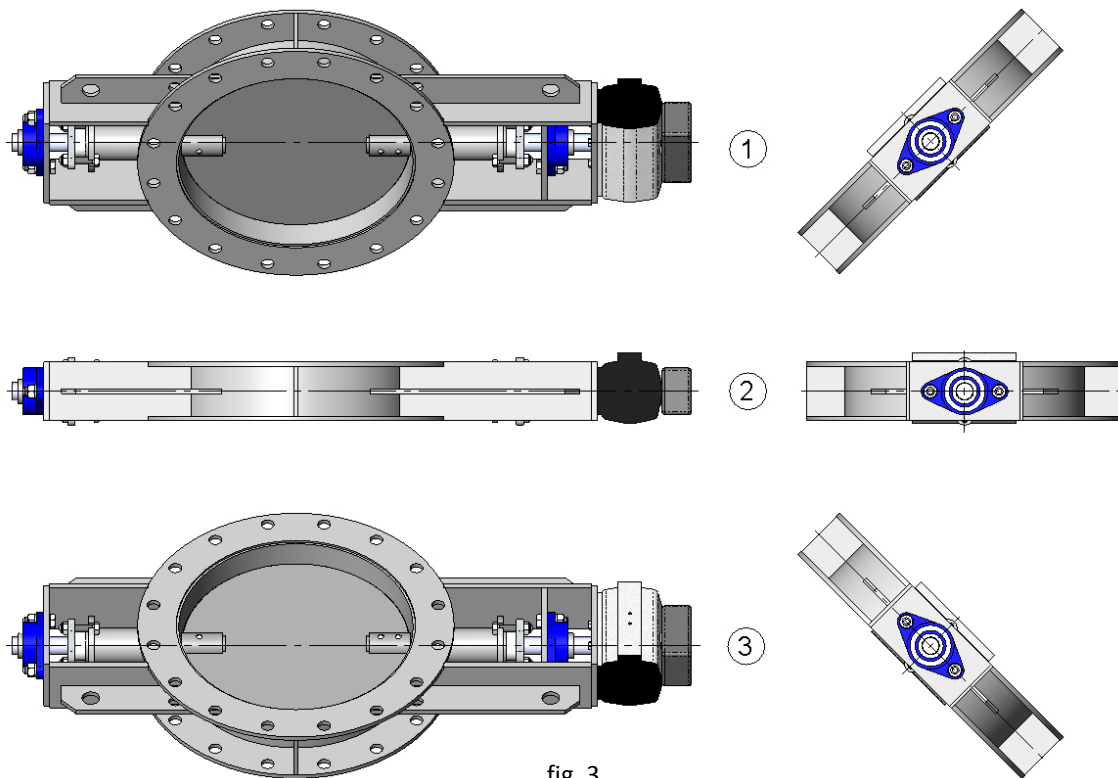


fig. 3

Once the damper butterfly is installed in the pipeline and it has been pressurised, it is very important to check for any leakages from the packing gland to the atmosphere.

In the event of a leakage, tighten the nuts of the packing gland flanges crosswise until the leakage stops, ensuring that there is no contact between the packing gland and the shafts.

DAMPER BUTTERFLY

ML/MF SERIES

A very high tightening torque on the nuts of the packing gland flanges can lead to problems, such as an increase in the valve's torque, a reduction in the gasket's working life, or failure of the packing gland. The recommended tightening torques are indicated in Table 1.

| Tightening torques for packing gland bolts | |
|--|-------|
| DN 80 to DN 750 | 5 Nm |
| DN 800 to DN 3000 | 11 Nm |

table 1

Once the damper butterfly is in place, check that the flanges and electrical or pneumatic connections are secure. 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 damper butterfly 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 (with reducer, fig. 4)

In order to operate the damper butterfly: turn the handwheel clockwise to close. To open, turn the handwheel anti-clockwise.

CHAINWHEEL

To operate the damper butterfly, pull one of the chain's vertical drops, taking into account that sealing is carried out when the wheel turns clockwise.

LEVER (fig. 5)

First loosen the position lock system, which is located on the lever itself. Once released, turn the lever to open or close the valve. Lock the lever again to complete the operation.

PNEUMATIC (double and single acting)

The pneumatic actuators used by **C.M.O.** are designed to be connected to a 6 kg/cm² pneumatic network, although these cylinders support up to 10 kg/cm².

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

It is necessary to fit speed regulators in this type of actuator. The minimum time for each operation (opening or closing) is 6 seconds.

Two types of pneumatic actuator can be distinguished:

- The most common in this type of damper butterfly are ¼-turn (fig. 6 and 7). These are mounted directly on the actuator shaft.
- There are also the linear pneumatic cylinders (fig. 8). This type of actuator is mounted on a rod on the actuator shaft in order to convert the linear movement generated by the cylinder into rotational movement and turn the swing check.

DAMPER BUTTERFLY

ML/MF SERIES

These pneumatic actuators do not require any adjustment, since the pneumatic cylinder is designed for the exact run required by the damper butterfly.

HYDRAULIC (double and single acting)

C.M.O.'s hydraulic actuators are designed to operate at a standard pressure of 135 kg/cm².

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 damper butterfly.

MOTORISED (fig. 9)

If the damper butterfly is fitted with a motorised actuator, it will be accompanied by the electrical actuator supplier's instructions.

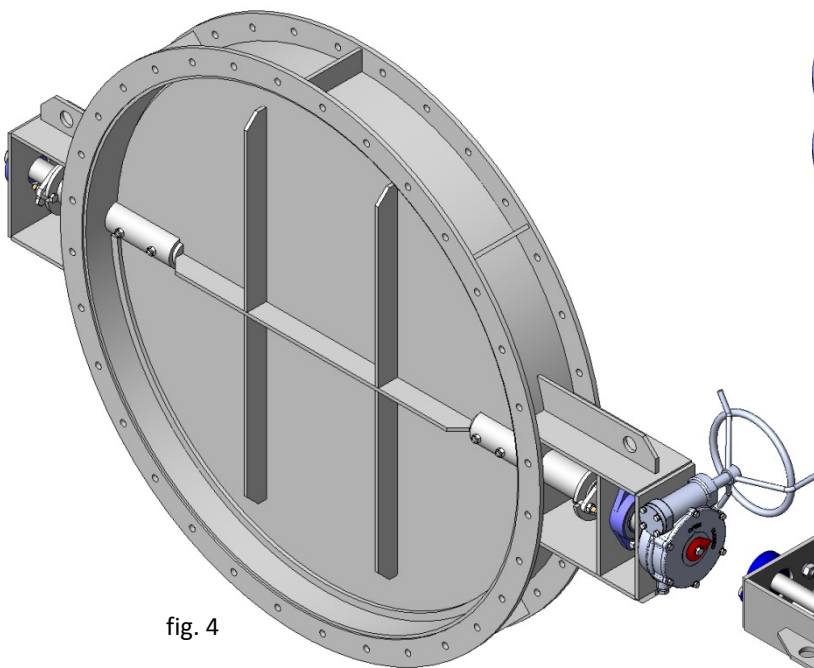


fig. 4

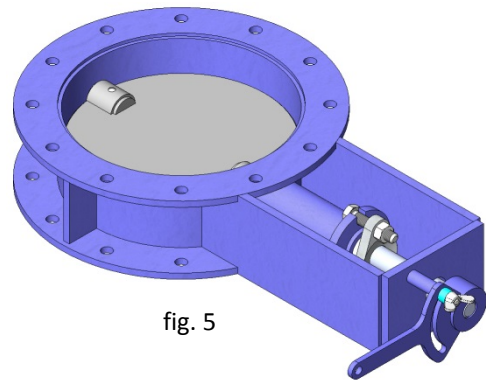


fig. 5

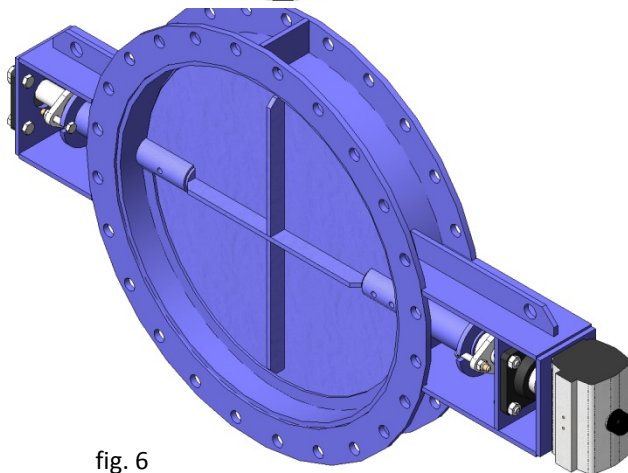


fig. 6
1/4 Turn double acting pneumatic actuator

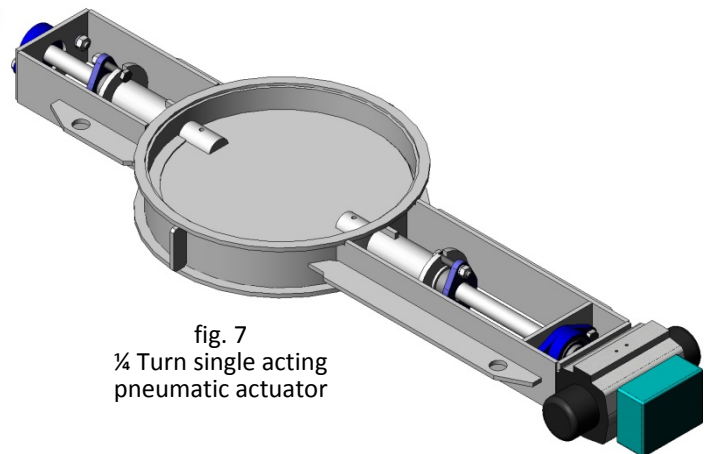


fig. 7
1/4 Turn single acting pneumatic actuator

C.M.O.

Amategui Aldea 142, 20400 Txarama-Tolosa (SPAIN)

MAN-MF/ML.ES00

Tel. National: 902.40.80.50 Fax: 902.40.80.51 / Tel. International: 34.943.67.33.99 Fax: 34.943.67.24.40

cmo@cmo.es <http://www.cmo.es>

page 7

DAMPER BUTTERFLY

ML/MF SERIES

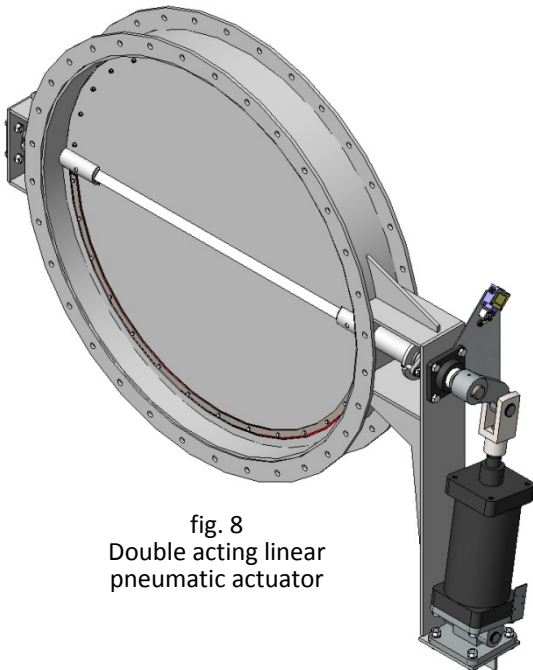


fig. 8
Double acting linear pneumatic actuator

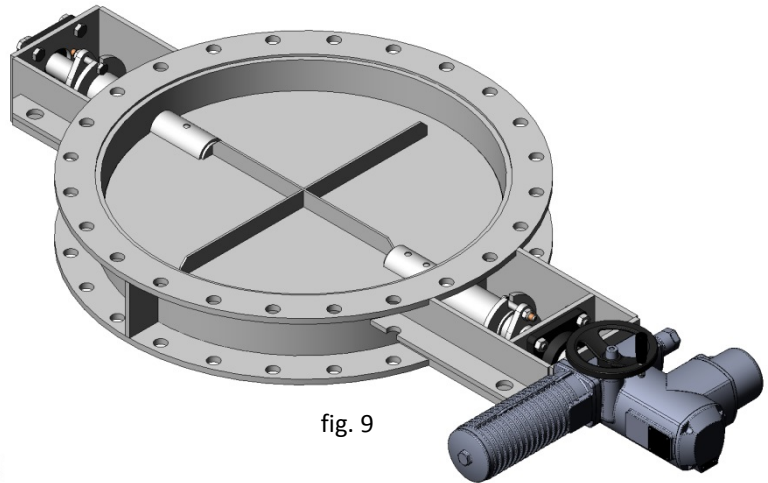


fig. 9

MAINTENANCE

C.M.O. will not be liable if the damper butterflies suffer any damage due to improper handling or without proper authorisation. The valves should not be modified unless expressly authorised by **C.M.O.** 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 damper butterfly and put up a warning sign to inform about the work being carried out.
- Completely isolate the damper butterfly from the whole process. Depressurise the process.
- Drain all the line fluid through the valve.
- Use non-electric hand tools during maintenance, in accordance with **EN13463-1 (15)**.



The only maintenance required in this type of dampers is to change the gasket and the seat (when fitted with a seal joint). It is recommended to regularly check the seal every 6 months, however its working life will depend on the valve's operating conditions, such as: pressure, temperature, number of operations, type of fluid and others.



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

C.M.O.

Amategui Aldea 142, 20400 Txarama-Tolosa (SPAIN)

MAN-MF/ML.ES00

Tel. National: 902.40.80.50 Fax: 902.40.80.51 / Tel. International: 34.943.67.33.99 Fax: 34.943.67.24.40

cmo@cmo.es <http://www.cmo.es>

page 8

DAMPER BUTTERFLY

ML/MF SERIES

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



If the fluid transported constitutes an internal explosive atmosphere, the user must regularly check the correct watertight integrity of the installation.

Regular cleaning of the damper butterfly to prevent accumulation of dust.

Assemblies are not permitted at the end of the line.

Avoid re-painting the products supplied.

IMPORTANT SAFETY ASPECTS

- The areas in which there is movement, whether inside or outside the conduit, are risk areas. This is particularly true in equipment supplied with drive systems which do not require energy (air tank, springs, etc.), since there is a risk of movement even when disconnected from the grid or pressurised air line.
- In order to work under ideal safety conditions, the magnetic and electrical elements must be in idle mode and the air tanks depressurised. 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 swing check.
- In units fitted with spring return actuators, the swing check must be mechanically locked and only unlocked when the actuator is pressurised.
- In units fitted with an electrical actuator, it is recommended to disconnect it from the grid in order to access the moving parts without any risk.
- Its importance means you should check that the damper butterfly's shaft has no load before disassembling the drive system.

Taking into account the recommendations indicated, the maintenance operations carried out in this type of equipment are shown below:

REPLACING THE GASKET

1. Make sure there is absolutely no pressure or fluid in the facility.
2. These **ML** or **MF** damper butterflies are usually fitted with two packing systems (fig. 10): one in the driving shaft and the other in the driven shaft. Start, for example, by replacing the driving shaft gasket.
3. Release and remove the nuts (14) from the packing gland flange (8) in order to move it along the shaft, separating it from the packing bushing (7) (fig. 11).

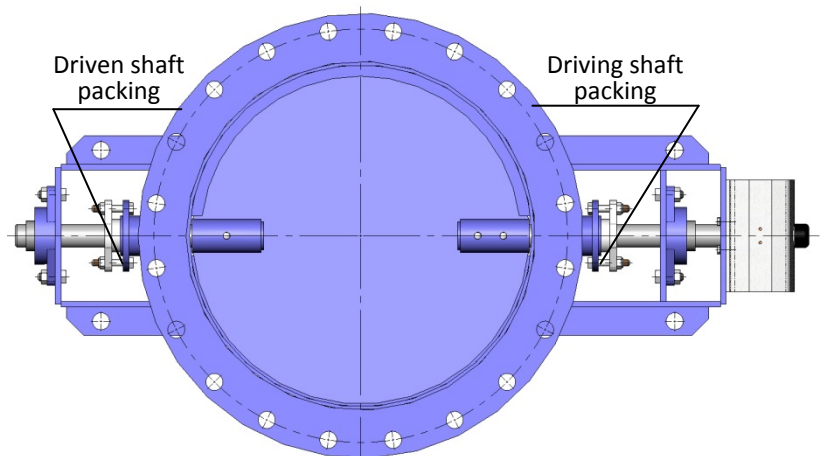


fig. 10

C.M.O.

Amategui Aldea 142, 20400 Txarama-Tolosa (SPAIN)

MAN-MF/ML.ES00

Tel. National: 902.40.80.50 Fax: 902.40.80.51 / Tel. International: 34.943.67.33.99 Fax: 34.943.67.24.40

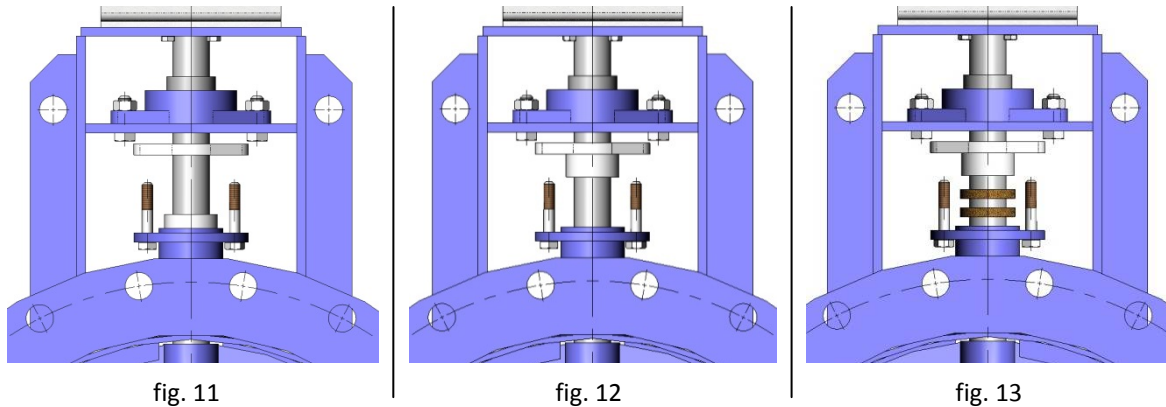
cmo@cmo.es <http://www.cmo.es>

page 9

DAMPER BUTTERFLY

ML/MF SERIES

4. Extract the packing bushing (7) from its location, moving it along the shaft for access to the gasket strips (6) (fig. 12).
5. Remove the old gasket (6) using a pointed tool, taking care not to damage the surface of the shaft (fig. 13).



6. Carefully clean the gasket housing and make sure to remove any excess or waste, thus ensuring that the gasket strips (6) fit correctly.
7. Insert the new gasket (6). During this operation it is very important that both ends of each strip are perfectly joined, forming a ring.
8. After correctly introducing all the gasket strips (6), insert the packing bushing (7) in its original position.
9. Continue to move the packing flange (8) along the shaft, until it is supported on the press bushing (7).
10. Mount the nuts (14) of the press flange (8) and tighten them carefully crosswise, taking care to ensure the packing bushing (7) cannot come into contact with the shaft.
11. It is very important to ensure that the surface of the packing flange (8) is always perpendicular to the shaft, thus ensuring that the press is exerting the same pressure throughout the gasket (6).
12. After replacing the gasket of the driving shaft, carry out the operations described in points 3 to 11 with the gasket of the driven shaft.
13. Once the gaskets of both shafts have been replaced, carry out several operations without load in order to check the correct operation of the damper butterfly and ensure that the packing bushing (7) is correctly aligned.
14. Subject the damper butterfly to pressure in the line and, if necessary, retighten the nuts (14) of the packing flanges (8) crosswise in order to prevent leakages.

***Note:** The numbers in brackets refer to the components list in Table 4.

| Ø STEM | GASKET |
|--------|--|
| Ø20 | 4 lines of 6 mm ² x 82 mm |
| Ø25 | 4 lines of 6 mm ² x 98 mm |
| Ø35 | 5 lines of 8 mm ² x 135 mm |
| Ø50 | 5 lines of 10 mm ² x 189 mm |
| Ø60 | 5 lines of 12 mm ² x 226 mm |
| Ø70 | 5 lines of 14 mm ² x 264 mm |

table 2

C.M.O.

Amategui Aldea 142, 20400 Txarama-Tolosa (SPAIN)

MAN-MF/ML.ES00

Tel. National: 902.40.80.50 Fax: 902.40.80.51 / Tel. International: 34.943.67.33.99 Fax: 34.943.67.24.40

cmo@cmo.es <http://www.cmo.es>

page 10

DAMPER BUTTERFLY

ML/MF SERIES

REPLACING THE SEALING JOINT (except metal/metal)

1. Make sure there is absolutely no pressure or fluid in the facility.
2. If there is not sufficient space, remove the damper butterfly from the pipe.
3. Place the swing check (2) in open position (fig. 14) in order to access the seal joints (10). These fit in the half-moon rims in the body (1).
4. Extract the two sealing strips (10) using a pointed instrument (fig. 15). One of these seals is in front of the rim and the other behind the other rim.

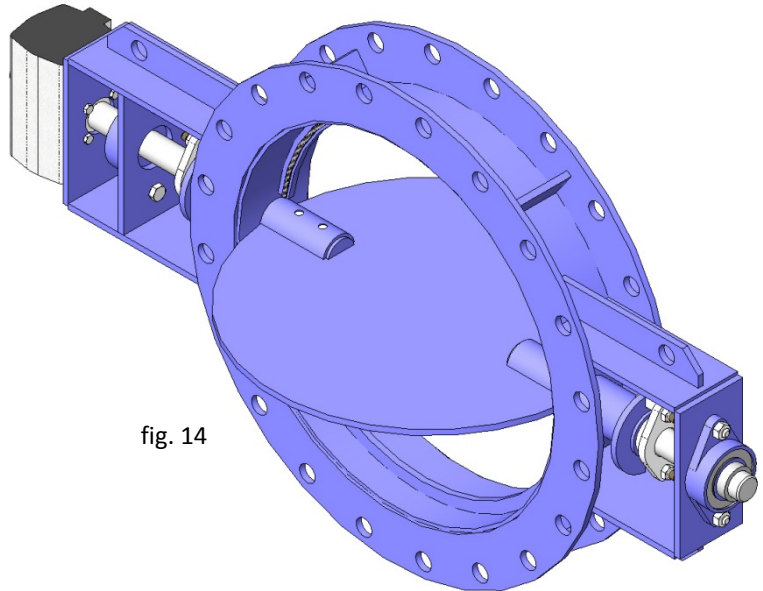


fig. 14

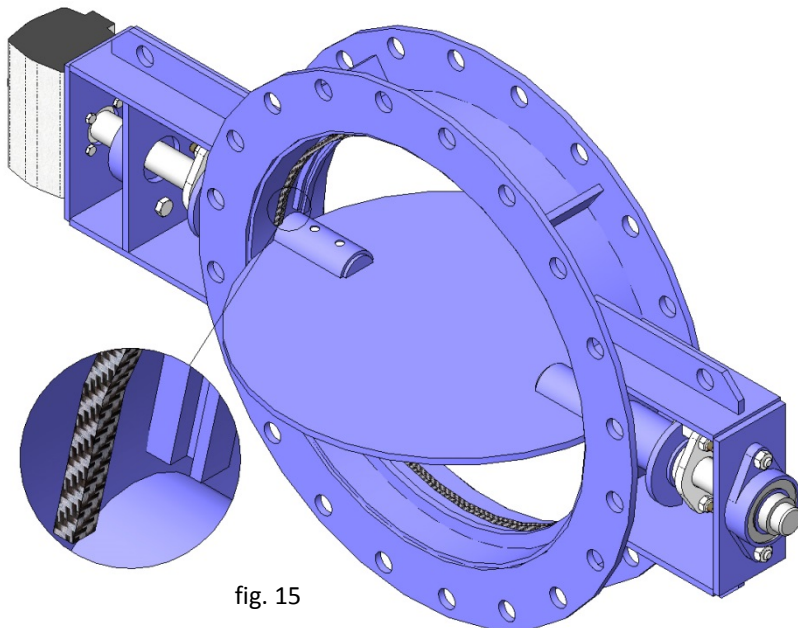


fig. 15

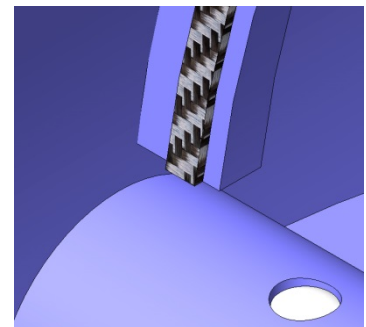


fig. 16

5. Carefully clean the channel for the seals. Ensure that it is clean of any excess or waste in order to fit the new seal strips (10) correctly.
6. Position the new seal strips (10) in their location. The new seal must also comply with the dimensions and characteristics necessary for the damper butterfly.
7. Cut both seal strips (10) to ensure they are flush with the half-moon rims (fig. 16).
8. Once the sealing joint has been replaced, carry out several operations without load to check that the swing check is seated correctly on the seal.
9. Reassemble the damper butterfly in the pipe.
10. Carry out operations without load in order to check that there are no objects which prevent the swing check from moving freely.
11. The valve is now ready to operate normally.

***Note:** The numbers in brackets refer to the components list in Table 4.

C.M.O.

Amategui Aldea 142, 20400 Txarama-Tolosa (SPAIN)

MAN-MF/ML.ES00

Tel. National: 902.40.80.50 Fax: 902.40.80.51 / Tel. International: 34.943.67.33.99 Fax: 34.943.67.24.40

cmo@cmo.es <http://www.cmo.es>

page 11

DAMPER BUTTERFLY

ML/MF SERIES

LINEAR PNEUMATIC ACTUATOR MAINTENANCE

The linear pneumatic cylinders in our linear damper butterflies 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 C.M.O. Below is an exploded diagram of the pneumatic actuator and a list of the cylinder's components. The top cover and the support cover are usually made of aluminium, although pneumatic cylinders over Ø200 mm are made of cast iron GJS-400.

The maintenance kit normally includes: the bushing with its seals and the scraper. The piston can also be supplied if the customer so requires.

The steps to follow to replace these parts are shown below.

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

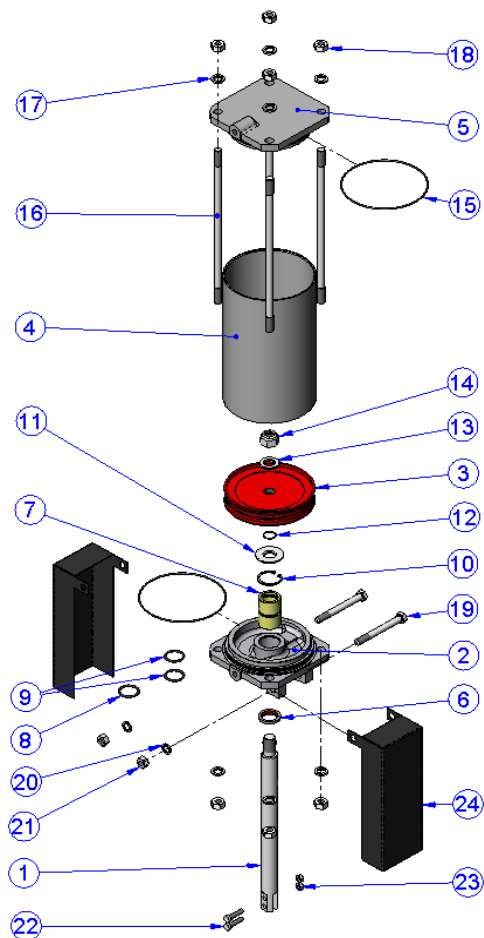


fig. 17

| PNEUMATIC ACTUATOR | | |
|--------------------|------------------|---------------|
| POS. | DESCRIPTION | MATERIAL |
| 1 | SPINDLE | AISI-304 |
| 2 | SUPPORT COVER | ALUMINIUM |
| 3 | PISTON | S275JR + EPDM |
| 4 | CASING | ALUMINIUM |
| 5 | UPPER COVER | 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 | BRACES | 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 | SELF-LOCKING NUT | A-2 |
| 24 | PROTECTION | S275JR |

table 3

C.M.O.

Amategui Aldea 142, 20400 Txarama-Tolosa (SPAIN)

MAN-MF/ML.ES00

Tel. National: 902.40.80.50 Fax: 902.40.80.51 / Tel. International: 34.943.67.33.99 Fax: 34.943.67.24.40

cmo@cmo.es <http://www.cmo.es>

page 12



DAMPER BUTTERFLY

ML/MF SERIES



After maintenance and in an ATEX zone, you must check the electrical continuity between the pipe and the rest of the damper butterfly components, such as the body, swing check, shafts, etc., Standard EN 12266-2, Annex B, points B.2.2.2. and B.2.3.1.

STORAGE

To ensure the damper butterfly is in optimum conditions of use after long periods of storage, it should be stored in a well-ventilated place at temperatures below 30°C.

It is not advisable, but, if stored outside, the damper butterfly 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 undercover.
- It is not recommended to store the equipment outdoors with direct exposure to adverse weather conditions, such as rain, wind, etc. This is particularly important if the equipment is not protected with suitable packaging.
- 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 damper butterfly's moving 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 loss of shape.
- If the equipment is stored without suitable packaging it is important to keep the damper butterfly's moving 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.

DAMPER BUTTERFLY

ML/MF SERIES

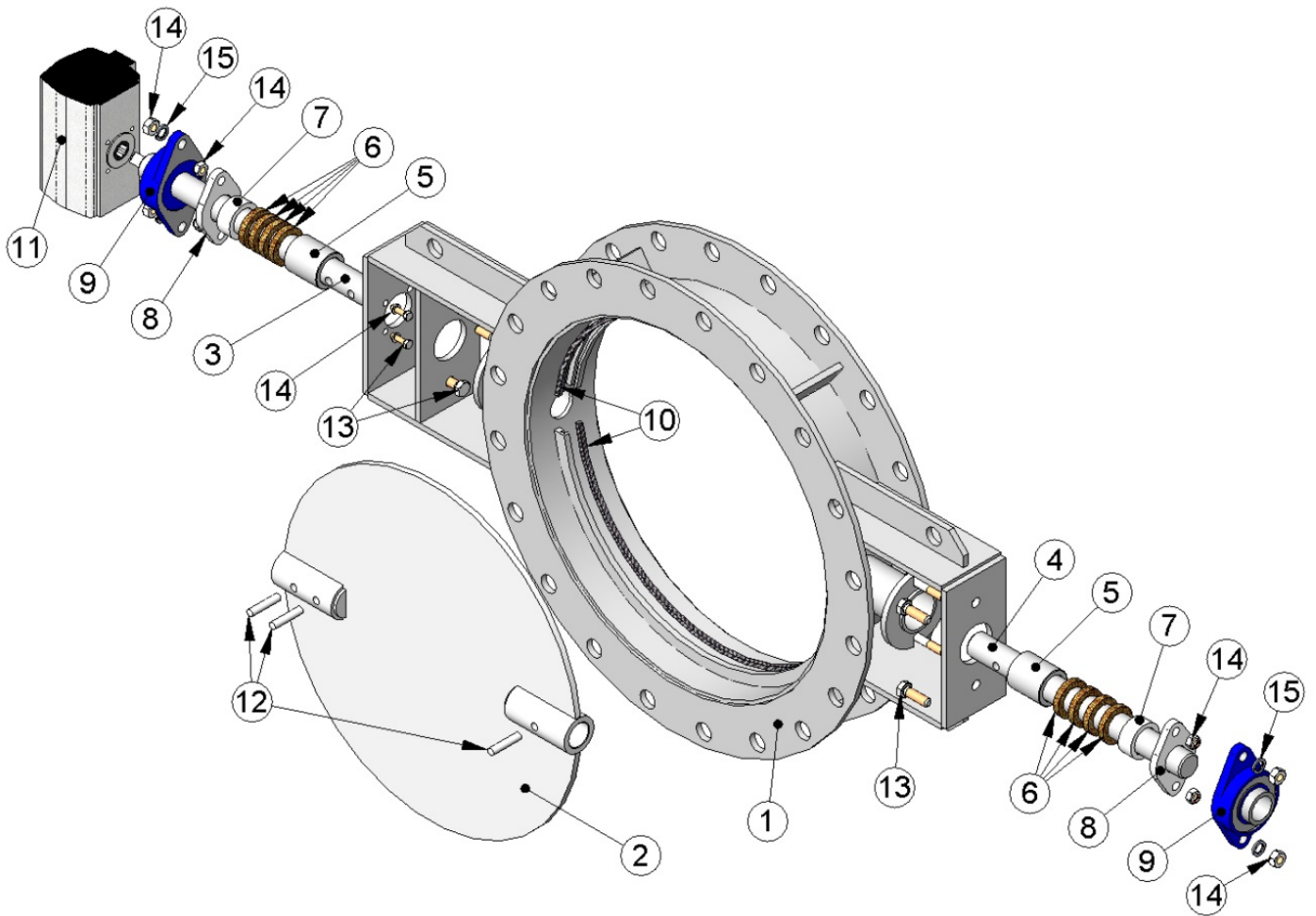


fig. 18

| STANDARD COMPONENTS LIST | | | | | |
|--------------------------|---------------|------|----------------------|------|-----------|
| POS. | COMPONENT | POS. | COMPONENT | POS. | COMPONENT |
| 1 | Body | 6 | Gasket | 11 | Actuator |
| 2 | Swing check | 7 | Press bushing | 12 | Pin |
| 3 | Driving shaft | 8 | Press flange | 13 | Bolt |
| 4 | Driven shaft | 9 | Support with bearing | 14 | Nut |
| 5 | Spacer | 10 | Seal (optional) | 15 | Washer |

table 4

C.M.O.

Amategui Aldea 142, 20400 Txarama-Tolosa (SPAIN)

MAN-MF/ML.ES00

Tel. National: 902.40.80.50 Fax: 902.40.80.51 / Tel. International: 34.943.67.33.99 Fax: 34.943.67.24.40

cmo@cmo.es <http://www.cmo.es>

page 14