

VD



INSTRUCTIONS AND MAINTENANCE MANUAL



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ASSEMBLY

APPLICATION OF EUROPEAN DIRECTIVES

See the applicable directives document for **CMO Valves**.

VD damper valves may comply with the directive on protection systems and devices 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 damper 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 multisector damper, check that the crane to be used is capable of bearing its weight.
- Do not lift the damper valve or hold it by the actuator. Lifting the damper valve by the actuator can lead to operating problems as it is not designed to withstand the weight of the whole unit.
- Do not lift the **VD** multisector damper by the fluid flow area. If a sealing system is fitted, it is located in this area. The sealing rims and surface may be damaged if the valve is lifted in this way, causing leakage problems during operation.
- Using soft straps to lift these **CMO Valves** damper valves is recommended in order to prevent any damage, especially to the anticorrosive protection. These straps should be secured using the orifices fitted in the equipment 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. If two or more valves are packed together, separation and securing elements must be provided between them to prevent any movements, knocks and friction during transport. When storing two or more multisector dampers in the same box, ensure they are correctly supported in order to prevent any loss of shape. In the case of shipment by sea, we recommend using vacuum bags inside the boxes to protect the equipment from contact with sea water.
- Take care to maintain the correct levelling of the valves during loading, unloading and transport, in order to prevent any deformation in the equipment. We recommend using mounts or trestles.

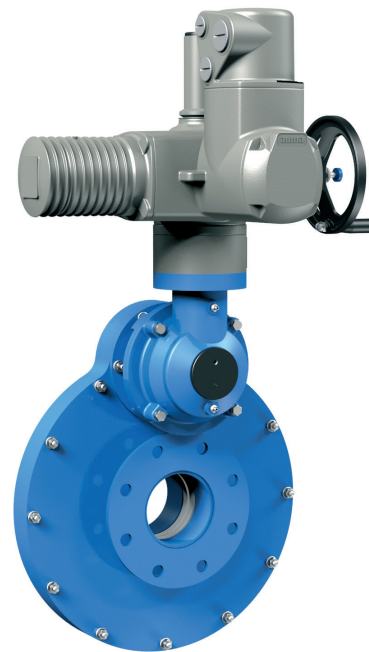


Fig. 1

INSTALLATION

In order to avoid personal harm and other types of damage (to the facilities, the valve, etc.), please follow these instructions:

- All personnel in charge of installing or operating 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 about the work.
- Completely isolate the valve from the whole process. Depressurise the process.
- Drain all the line fluid through the valve.
- Use non-electrical hand tools during installation and maintenance, in accordance with regulations.

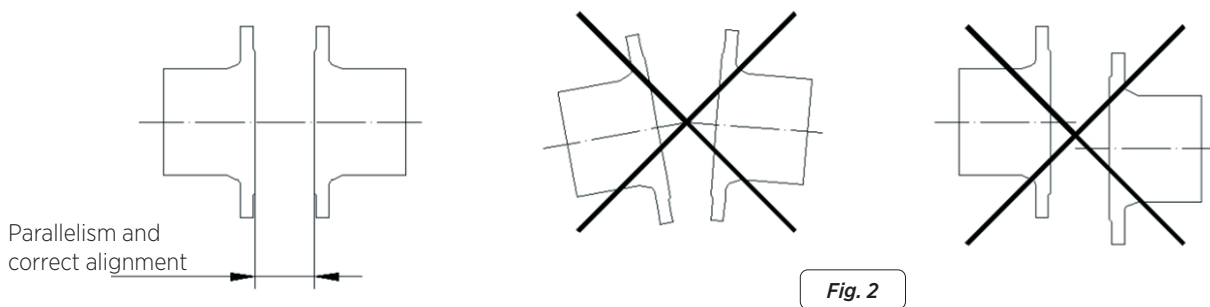


Before installation, inspect the damper butterfly to ensure no damage has occurred during transport or storage. Make sure that the inside of the valve body and, in particular, the seal area are clean. Inspect the pipes and the flanges to make sure they are clean.

IMPORTANT ASPECTS TO CONSIDER DURING ASSEMBLY

- **VD** multisector damper light valves are bidirectional and work in the same way in both directions, meaning the direction the valve is mounted in is irrelevant.
- Special care must be taken to respect the correct distance between the flanges and ensure they are correctly aligned and parallel (fig. 2).

Any incorrect position or installation of the flanges may cause deformation in the valve’s body, which could lead to operating problems.



It is very important to make sure that the damper is correctly aligned and parallel to the flanges in order to prevent leakages and avoid loss of shape.

- The bolts in the threaded blind holes will have a maximum depth and will never reach the bottom of the hole. As shown in the documentation of the VD-s characteristics, these damper valves have numerous variables; please ask for further details.
- The equipment must be firmly installed in the duct. The joint to the duct can be bolted or welded.
- When the joint is bolted to the duct, watertight seals must be positioned between the duct and the damper valve in order to prevent any leakage. These seals will be selected in line with the working conditions inside the duct (temperature, pressure, type of fluid, etc.). The nuts and bolts to be fitted must also be suitable for the operating conditions, and their measurements must be in accordance with the approved drawings.
- The nuts and bolts will be assembled diagonally. The torque to apply to the fastening nuts and bolts must be correct according to the applicable standard; we recommend carrying out the initial assembly with a low tightening torque and, once all the bolts are in place, applying the final torque.
- Take care when welding if the joint is welded to the duct. Loss of shape may come about in the damper valve due to the tensions created by welding, which may lead 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. Finish by making the continuous weld of the joint between the duct and the damper valve.
- As regards scaffolding, ladders and other auxiliary elements to be used during assembly, follow the safety recommendations in this dossier.
- Once the equipment has been assembled, ensure there are no interior or exterior elements that may interfere with the movement of the discs.
- Make the relevant connections (electrical, pneumatic, etc.) in the equipment’s actuator system following the instructions and wiring diagrams supplied with it.
- 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 indicator elements (limit switches, positioners, etc.).
- When operating the equipment, follow the safety recommendations set out in this dossier.

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

The shaft area is sealed thanks to O-rings housed inside bronze bushing to ensure sealtight integrity between shaft and bonnet, thus avoiding any leakage to the atmosphere; all such seals will be made of material suitable for the temperature requirements requested.

In the event of extreme temperature conditions, this type of sealing can be replaced with graphite gaskets or ceramic material.

In any case, the sealing system is in an easily accessible area, and can be replaced without removing the valve from the line.

All **CMO Valves** are tested at our facilities, although the packing gland nuts may come loose during handling and/or transport and need to be retightened.

Once the damper valve is installed in the pipeline and it has been pressurised, it is very important to check for any leakages.

In the event of leakage, the possible cause could be the O-rings being in a poor condition and needing to be replaced; or, if the valve has packing, the packing flange nuts should be retightened crosswise until the leakage disappears, taking into account that there should not be any contact between the packing glands and the shafts.

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.



If you are 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 conductivity between the inlet and outlet pipelines.

ACTUATOR

GEARED HANDWHEEL (fig. 3)

In order to operate the damper valve: turn the wheel anticlockwise to close. Turning the wheel anticlockwise causes it to open.

CHAIN HANDWHEEL

Pull one of the chain's vertical drops to operate the damper valve, taking into account that sealing is carried out when the handwheel turns clockwise.

MOTORISED (fig. 4)

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



Fig. 3



Fig. 4

MAINTENANCE

CMO Valves will not be liable if the damper suffers any damage due to improper handling or without proper authorisation. The valves should not be modified unless expressly authorised by **CMO Valves**. In order to avoid personal or material damage during maintenance, please follow these instructions:

- All personnel in charge of installing or operating 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 dampers and put up a warning sign about the work being carried out.
- Completely isolate the damper valve from the whole process. Depressurise the process.
- Drain all the line fluid through the valve.
- Use non-electrical hand tools during maintenance, in accordance with regulations.



The only maintenance required for this type of damper is to change the shaft seals, if fitted. It is recommended to regularly check the packing gland every 6 months; however, its working life will depend on the valve's working 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 valve, causing a risk of explosion. The user will be responsible for carrying out appropriate actions in order to minimise these risks. Maintenance personnel 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 installation's correct watertight integrity.

Regular cleaning of the damper valve to prevent any build-up of dust.

Assemblies are not permitted at the end of the line.

Avoid repainting the products supplied.

IMPORTANT SAFETY ASPECTS

- Any areas where there is movement, whether inside or outside the duct, are risk areas. This is particularly true in equipment supplied with drive systems that 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. Maintenance personnel must be up to date with safety regulations, and work can only start under orders from the site's safety personnel.
- The safety areas must be clearly marked, avoiding placing auxiliary equipment (ladders, scaffolding, etc.) on levers or moving parts, which may lead to the discs moving.
- In units fitted with spring return actuators, the discs must be mechanically locked and only unlocked when the actuator is pressurised.
- In equipment with an electrical actuator, it is recommended to disconnect it from the mains in order to access the moving parts without any risk.
- Its great importance means you should check that the multiselector damper valve's shafts have no load before disassembling the actuator system.

REPLACING THE O-RING (Fig. 5)

Regularly check the shaft O-rings, replacing them in the event of deterioration or lack of sealtight integrity.

It is not necessary to remove the duct valve in order to replace the O-rings (9), as this change can be carried out with the valve mounted.

Do not use sharp tools during this process.

ACTUATOR SIDE

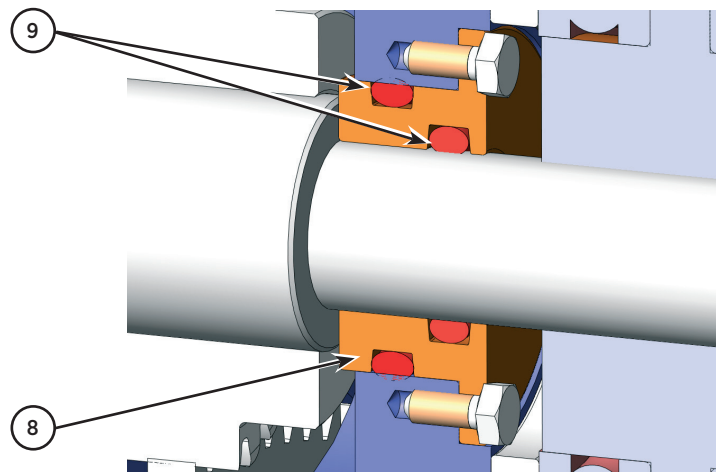


Fig. 5

1. Make sure there is absolutely no pressure and fluid in the facility.
2. Before releasing any part, always mark its original position.
3. Release the whole actuator unit.
4. Loosen the bronze bushing (8) and remove it from the shaft.
5. Remove the deteriorated O-rings (9).
6. Clean the O-ring housing.
7. Place new O-rings (9) on the bronze bushing (8).
8. Insert the bronze bushing (8) in the shaft and return to the original location.
9. Bolt the bronze bushing (8) diametrically.
10. Mount the actuator unit in its original position.
11. Carry out several operations with no load, checking the valve works correctly.
12. Pressurise the valve in the line, and check there are no leakages around the shaft.

STORAGE

To ensure the damper 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.

Although not recommended, when stored outside, the damper 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.
- Storing the equipment outdoors with direct exposure to adverse weather conditions, such as rain, wind, etc., is not recommended. 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 multisector damper’s moving parts, and this can lead to operating difficulties. The actuator system can also be damaged due to the particles being introduced 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 damper valve’s moving parts lubricated, which is why it is best 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

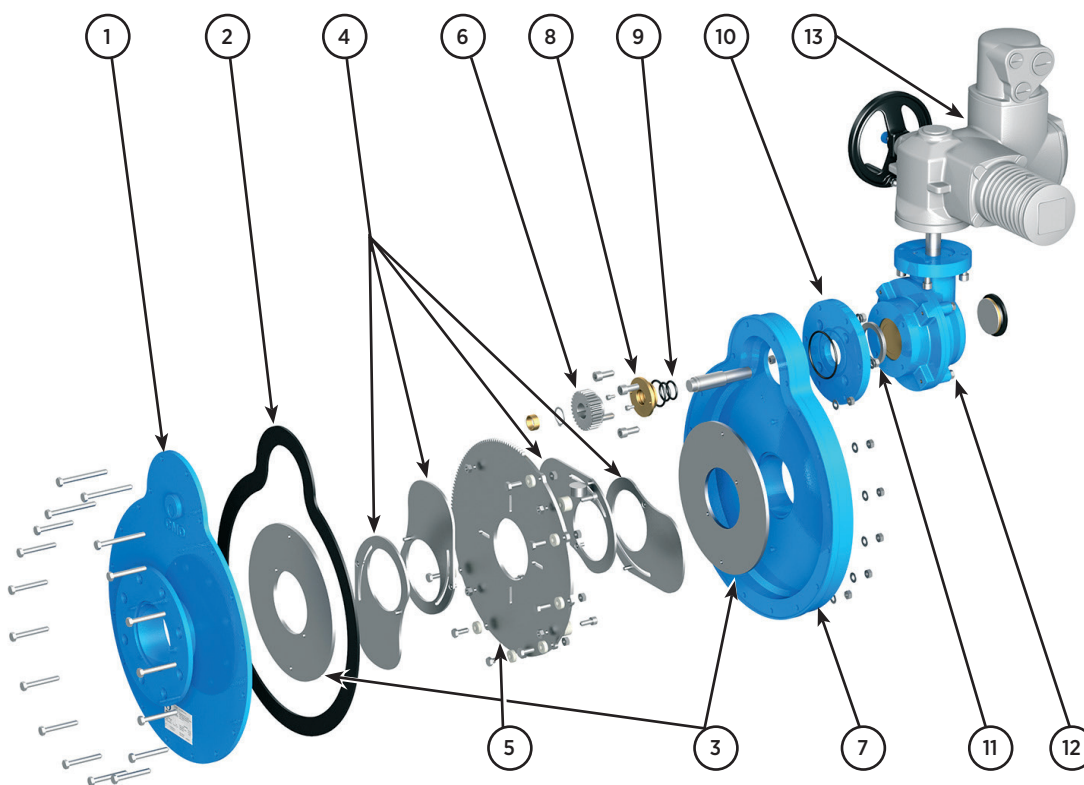


Fig. 6

Table. 1

POS.	DESCRIPTION
1	FRONT COVER
2	COVER JOINT
3	FIXED DISC
4	VD SECTOR
5	MOVING DISC
6	PINION
7	ACTUATOR COVER
8	BRONZE BUSHING
9	O-RINGS
10	ACTUATOR BRACKET
11	GEAR SHIM WASHER
12	GEAR
13	MOTOR



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