PNEUMATICALLY OPERATED SHUT-OFF VALVES FOR FLUID

INSTALLATION, USE, AND SERVICE MANUAL

READ CAREFULLY THIS MANUAL BEFORE USING OUR PRODUCTS

INTENDED USE

All valves, produced by Maros Engineering S.r.l., referring to this manual, are designed to intercept a large variety of liquids and gases, compatibly with raw materials used for their manufacture. The datasheets of each valve (available in our catalogues and on the website: www.marosengineering.com) evidence the use limits, which must be strictly respected.
Therefore, before proceeding with the order, customers must carefully verify the following points:

- Fluid's compatibility with the raw materials of which the valve is made. Maros Engineering provides an appropriate table of chemical compatibility in order to support customers for the best choice.
- Maximum temperature of the intercepted fluid
- Maximum pressure of the fluid, that is maximum pressure gap between input and output of the valve (max ΔP).
- Minimum and maximum pilot pressure to let the actuator work.
- Minimum and maximum ambient temperature.

The valves included in this manual absolutely **CAN NOT** be used in combination with dangerous liquid or gas such as:

Explosive

Extremely flammable or simply flammable (in case the maximum temperature at which the valve could be exposed is higher than the flash point)

Highly toxic

Cryogenic liquids

-Use of the valves in potentially explosive atmosphere is only allowed for the suitable models and under specific request from the customer. The non mention of this intended use constitutes an act of serious negligence and it frees Maros Engineering from any liability both for its products and for the traded ones. MAROS engineering valves **are not safety valves** and therefore must absolutely **NOT** be employed for such applications and cannot be installed on equipment where their malfunctioning can cause damage to people and properties.

SAFETY

-All products included in this manual are under-pressure devices. Wrong or inappropriate use can bring to accidents with serious consequences for people (till death) and properties.
Follow strictly manufacturer guidelines here listed regarding installation, use, and maintenance/service.

- All operations on the product must be performed only by qualified and professionally suitable personnel.
- Before installation, use, and maintenance, check that the pressure and temperature of the equipment are not higher than the maximum temperature indicated in the valve datasheet.
- In case of fluid flowing at a high temperature, such temperature can be transmitted to external surfaces, so make sure that mounting is done in a position that does not allow accidental contact by personnel.

-Before any operation, make sure that the part of the duct on which the valve is mounted, is separated from the rest of the system and the pressure is placed to zero. In case of high-temperature fluid wait for an adequate amount of time to let the fluid cool and avoid damage to people, fires, etc.
- In case the valve is passed through by aggressive fluids it is recommended that the operator, for any operation, uses adequate protection (e.g. gloves, safety glasses, specific protective clothing).
- Check the fluid's compatibility with the materials the valve is made, with particular attention to the gaskets. If in doubt, contact the supplier. Use with non-compatible fluids can bring to gaskets' deterioration causing dangerous leakages.
- Be sure the pneumatic actuator is operated with a pressure interval within technical specifications. Higher pressure than allowed can cause not bearable structural stress to the valve and consequent irreparable damage.
- In case of piston valves, if the fluid is incompressible (majority of liquids) it is recommended the entrance opposite to the closing movement ("against flow") so as to prevent water hammer which could be quite dangerous for the entire pipeline. Otherwise, it is necessary to install a safety system to prevent this event. In the case of ball valves, a gradual opening or closing is recommendable.
- If there is a possibility that the maximum pressure and temperature values of the valve will be accidentally exceeded in the plant branch where it is mounted, provide for the presence of a safety system to prevent such overloads (e.g. a thermostat for temperature and a pressure controller for pressure).

- All MAROS Engineering valves are designed to operate with homogeneous fluids. The presence of solid particles in suspension can lead to premature wear of seals (especially on ball valves), abrasion and scratching on moving components, with the possibility of seizing and consequent loss of tightness up to the possibility of irreparable failure.

-Concerning piston valves, it is crucial to avoid the possibility of any foreign body getting in between the seat and the piston, otherwise the latter may be deformed or broken. To avoid the aforementioned risks, it is advisable to provide for the installation of a strainer upstream of the system, or at least before the valve itself.

- The foreseeable risks associated with valve malfunctions cannot be defined by the manufacturer, since they depend on the characteristics of the plant on which it is installed. The risk assessment must therefore be carried out by the user as part of the analysis performed on the entire plant. In cases where, due to the characteristics of the plant itself, there may be a risk of the formation of an explosive atmosphere, it is necessary to use warning devices (sensors) or protective barriers.
An additional risk factor may be related to the flammability of any dust deposited on the valve. In this case, it is advisable to carry out an assessment of the allowable temperatures for the contact surfaces as defined by the technical standard UNI EN ISO 13732-1:2007

- In case the surface temperatures exceed the allowable range, it is recommended to use systems to protect the exposed parts, or at least to mark with appropriate symbols the presence of dangerous areas In addition, to prevent the product from becoming a potential source of ignition due to electrical charges (static and non-static), it should be "grounded."

- MAROS Engineering valves are not suitable for supporting loads of external origin that can be induced by any portion of the system on which they are mounted. The section of duct involved must support the valve and not vice-versa. The installer should take the utmost care in performing an assembly in perfect stable condition in order to avoid twisting, bending, and abnormal stress that could cause hazardous situations for the entire system.

-Modifications of any kind made by the customer/user are not allowed on our products.
MAROS Engineering, if it deems it possible and appropriate, may make modifications upon written request of the customer within its manufacturing facility. Any modification made on the valve without the manufacturer's authorization will immediately invalidate any warranty and any liability for any resulting damage.

INSTALLATION AND USE

- The function of a valve must correspond to the purpose for which the valve was designed. The technical data sheets provided by MAROS Engineering make it possible to verify the suitability of valves for a specific application. The manufacturer is, however, able to provide, through its Technical Department, advice on the best use of its articles on the systems in which they will be assembled, based on precise and detailed information from the customer/user.
- The installation of valves in the system may only be carried out by "qualified" personnel.
For the purpose of these instructions, qualified persons are defined as those persons who, on the basis of their profession and experience, are able to correctly perform the tasks assigned to them and to perform what is necessary to minimize hazardous situations for the plant.

- There are any special instructions regarding the handling of valves. Depending on the size and weight, appropriate transport methods must be used (using trolleys, trans pallets, lifting straps, etc.) in order to avoid falls could endanger the operator as well as impair the efficiency and quality of the product itself. Lift and handle the valves by acting on the valve body, avoiding parts where there may be components more easily subject to breakage, such as handwheels, rods, switch-boxes, etc. For butterfly valves, assembly with the disc in the closed position is recommended to avoid damage.

- Check compatibility between the valve/duct connections (type of thread, flanging, etc.). It is advisable to connect the valve to the line using piping with at least equivalent use characteristics and possibly identical material for best performance.

In the event that the connection to the line is made with parts made of a material different from that of the valve, check the compatibility of the materials being coupled. Valves and actuators should be installed in an ergonomically favorable and easily accessible position in accordance with UNI547-1: 1998.
- The valve must be assembled while the plant is stopped, taking care that the duct concerned is completely empty and insulated. The positioning must facilitate maintenance work as much as possible.

MAINTENANCE

- Before carrying out any operations, make sure that the system is stopped. Having verified this, the following operations must be carried out on each type of valve.

a) Completely isolate the portion of the plant on which the valve is mounted, completely zero the pressure of the intercepted fluid (or completely discharge the vacuum if this is the case), and, if necessary, wait until the temperature has fallen to an acceptable level.
b) Stop and isolate the compressed air circuit, completely relieve the pressure still present inside the actuator, and disconnect the supply fitting(s) from the actuator.

- In case of ball and butterfly valves maintenance consists essentially of replacing the seals. As far as the valve body is concerned, this operation is not recommended because it is laborious and unprofitable, and it is therefore more convenient to replace the complete part. For actuator maintenance, instead, it is first necessary to remove the actuator from the valve body by unscrewing a few screws. It is however advisable that spare parts replacement is carried out by Maros Engineering's personnel. Otherwise, and upon request, we will provide detailed technical assistance for the operation, bearing in mind that these operations can only be performed by qualified personnel.

- As for piston valves, the valve body does not require any maintenance, as all the components to be replaced (seals, etc.) are located in the actuator.
Proceed in the following sequence:
1) Unscrew the actuator from the valve body - in Normally Closed valves the plug is pressed onto the seal seat by a preloaded spring, therefore to perform this operation it is advisable to hold the plug up by acting on the cylinder with an external source of compressed air.
2) Unscrew the nut at the end of the stem to proceed with the removal of the seal holder and the replacement of the seal together with the rear O-ring.
3) To replace the remaining components of the kit revision (O-rings, rod guide, scraper and possibly one or more springs) it is necessary to remove the piston from the actuator cylinder. In the NC and NA versions, this operation and the subsequent reassembly must only be carried out by qualified personnel with suitable equipment, as there are one or more preloaded springs inside the actuator which, without the necessary precautions, can cause serious injury.

- The frequency of maintenance interventions is not quantifiable in general because it depends on factors mostly unknown at the time the product is sold (nature of the fluid intercepted, temperature of use, ΔP of

the valve, cyclical frequency, etc.). Maintenance scheduling must therefore be defined by the user as part of the analysis performed on the entire installation.
In any case, we recommend an accurate check of the plant's valve tightness approximately every 50,000 cycles; reduce this interval if the valve operates in harsh environmental conditions (corrosive, saline or extreme temperature environment).
- Maros Engineering declines all responsibility for any damage caused to persons or equipment as a result of incorrect maintenance procedures carried out by the end-user or as a result of extraordinary interventions without prior authorization.
- To avoid dust deposits that could become potential ignition sources, it is advisable to keep the external surfaces of the product clean. If the atmosphere in which the valve operates is particularly rich in dust, increase the frequency of this operation.

GUARANTEE:

The guarantee is valid for 12 months from the date on the valve label, and is limited to the replacement ex Maros Engineering's warehouse of those parts whose defectiveness is verified at Maros Engineering's factory.
Parts normally subject to wear and tear are excluded from the guarantee.
The Guarantee lapses in case of non-compliance of conditions such as:
- use in accordance with the information in this manual, Maros Engineering catalogues or any instruction sheet released by Maros Engineering.
- use of unsuitable fluids or lubricants and/or other than those recommended by Maros Engineering
- improper installation, maintenance and modifications operated by the Customer, its employees or any other persons outside our organization as well as incorrect storage.

Complaints shall in no case result in rescission of the contract.