

INSTALLATION, OPERATION AND MAINTENANCE MANUAL

MI, Three lever valve with quarter turn cylinder

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THIS VALVE INCLUDES A GENERAL DRAWING WITH A LIST OF MATERIALS OF THE VALVE SUPPLIED.

1. DESCRIPTION

The MI model is a general-purpose, unidirectional flanged valve for gaseous clean fluids such as atmospheric air, nitrogen, oxygen etc. and gaseous dirty fluids carrying suspended solids. For the latter application the valve has a register for both the build-up of solids and cleaning.

This is a valve which, due to its mechanical system of movement, offers several advantages compared to other butterfly valves. These advantages include the elimination of friction between the disc and the seat thus lengthening the valve's service life.

This model is mainly divided into 2 types: low pressure with values equivalent to 6 bar and high pressure, with pressures up to 40 bar. Likewise, as far as tightness is concerned, these valves are mainly constructed in 2 versions: soft seat and metal seated.

The valve complies with the following European directives:

- Machinery Directive

When applicable it can also comply with the following additional directives:

- Pressure Equipment Directive.
- Potentially Explosive Atmospheres (ATEX).

It is the user's liability to verify the maximum working conditions (PS, TS), medium (gas or liquid), dangerousness group (1 or 2) and if the fluid is unstable to properly classify the valve according to the Pressure Equipment Directive.

The valve may comply with other directives and certificates. ORBINOX offers, supplies and certifies valves according to the information received from the customer. The customer is liable to make sure this information is accurate and according to specific working conditions requirements where the valve will be installed.

2. HANDLING



Please pay special attention to the following points when handling an Orbinox valve:

Use the lifting lugs, available in all the valves of this model, for its moving and handling.

Do not lift the valve by holding it from the shaft of the actuator's base plate. The valve would be left totally uncompensated and might damage itself or the personnel handling it.

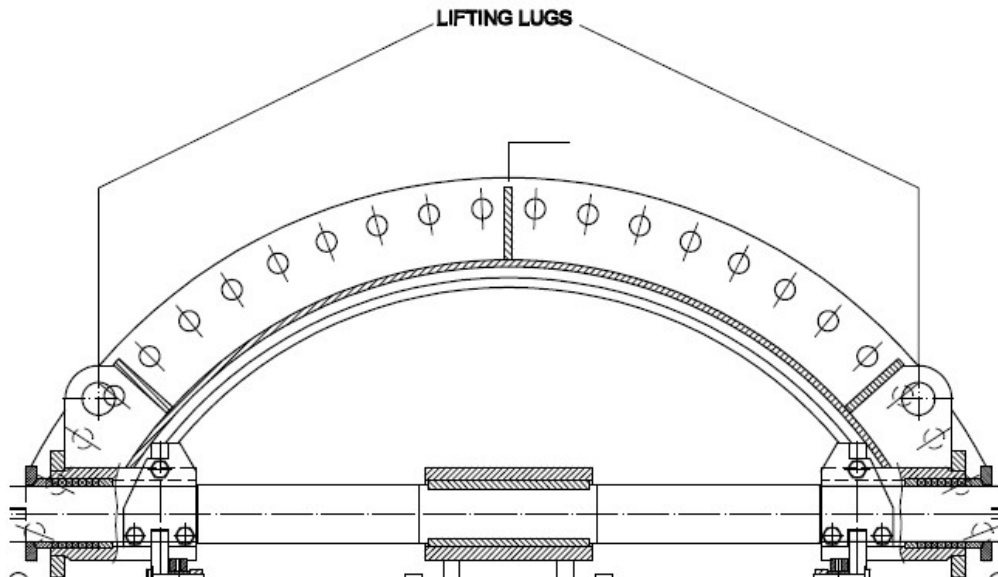
Do NOT lift the valve by the valve bore.

This can cause damage to the seating surface, seals and flange ledges.

SAFETY WARNING:

- Make sure that both the crane and the strops or slings used are tared to lift the weight of the valve.

These valves have support legs to prevent them from rolling while they are being tested or handled. These legs are not suitable to withstand neither the weight of the valve during its installation, nor the weight of the pipes.



3. INSTALLATION



In order to avoid personal injury or damage to property when handling or installing the valve, it is important to observe the following warnings:

- It is the User's responsibility to verify compatibility of valve parts materials with the internal fluid.
- The handling and maintenance of the valve must be carried out by qualified and trained personnel.
- Use appropriate personal protective equipment (PPE) (gloves, safety footwear...).
- Shut off all operating lines that affect the valve and place a warning sign saying work is being carried out on the valve.
- Isolate the valve completely from the process.
- Release process pressure.
- Drain the fluid from the valve.

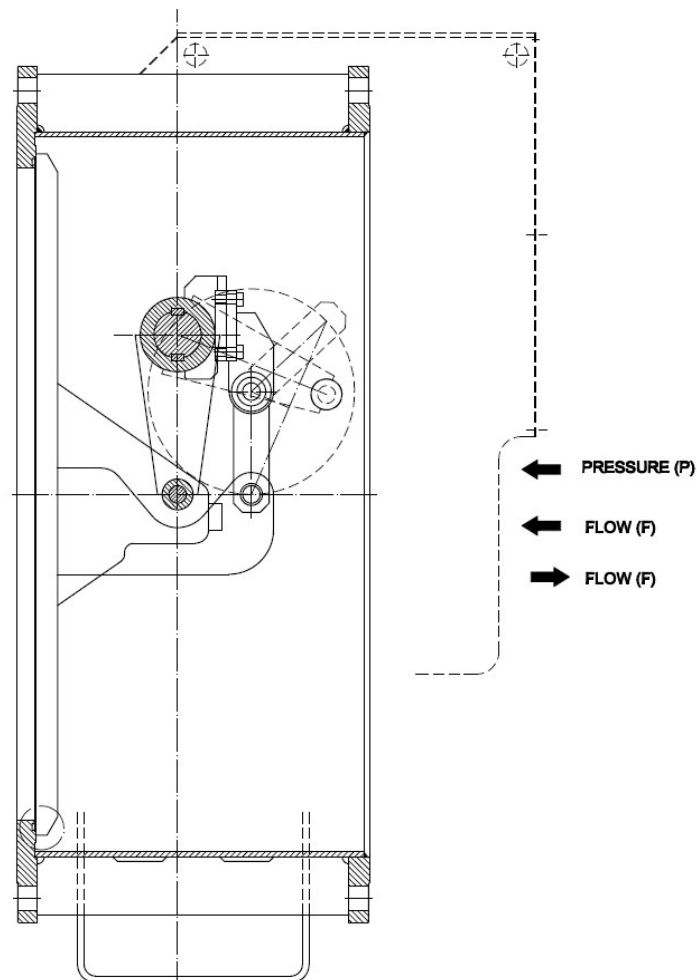
Before installing the valve, please inspect it to make sure that it has not suffered any damage during shipping or storage.

Make sure that the inner part of the body is clean, especially the SEAT area. The areas adjacent to the place where the valve is going to be installed (flanges, pipe,...) must also be clean.

As the valve is unidirectional, it must be installed so that the PRESSURE pushes the disc towards the SEAT. These valves have an arrow riveted on the body which indicates the direction of the

pressure. The installation and correct orientation of the valve with respect to the direction of the pressure will be the responsibility of the user.

It is important to point out that the direction of the flow does not necessarily coincide with the direction of the pressure:



Special care should be taken to maintain the correct distance between the connection flanges and to ensure their perfect alignment and parallelism.

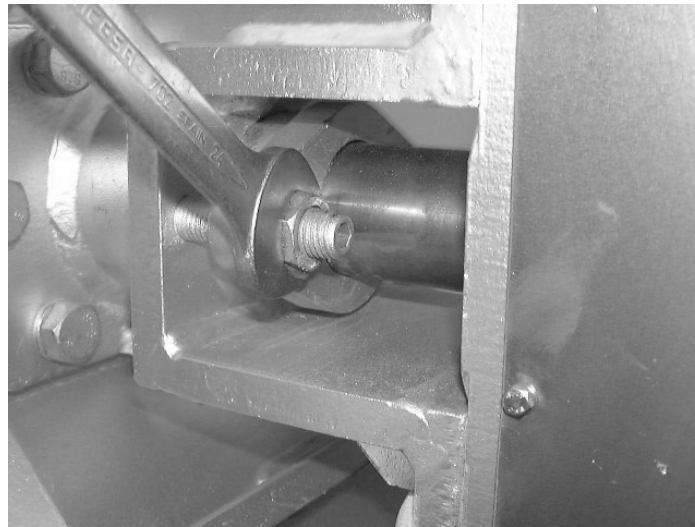
An incorrect positioning of the counter-flanges in the body of the valve might cause deformations, which can lead to operational difficulties.

The valve can be mounted in any position: horizontal, vertical or at an angle, depending on installation needs. **OBLIGATORILY**, the actuator shaft must be mounted in horizontal position. In horizontal lines or lines at an angle, try to keep the shaft on the upper part, besides being horizontal.

In the cases where the valve has electric accessories, such as motorised actuator, electrovalves, end of stroke switches, electro-pneumatic positioners, etc., the corresponding earth connections must be made before it is put into operation.

Operate the valve with no flow at first and then with flow, in order to test its operation and watertightness. It should be noted that the packing material might settle during shipping/storage of the valve, which can cause minor leakage. This can be verified by applying soapy water in the gland

follower-packing area once we have pressure inside the valve. It can be remedied by tightening the gland follower slightly, until the leakage has disappeared.



4. QUARTER-TURN PNEUMATIC ACTUATOR

The actuator has a visual position indicator. For its maintenance, follow the manufacturer's instructions.

5. MAINTENANCE



In order to avoid personal injury or damage to property when handling or installing the valve, it is important to observe the following warnings:

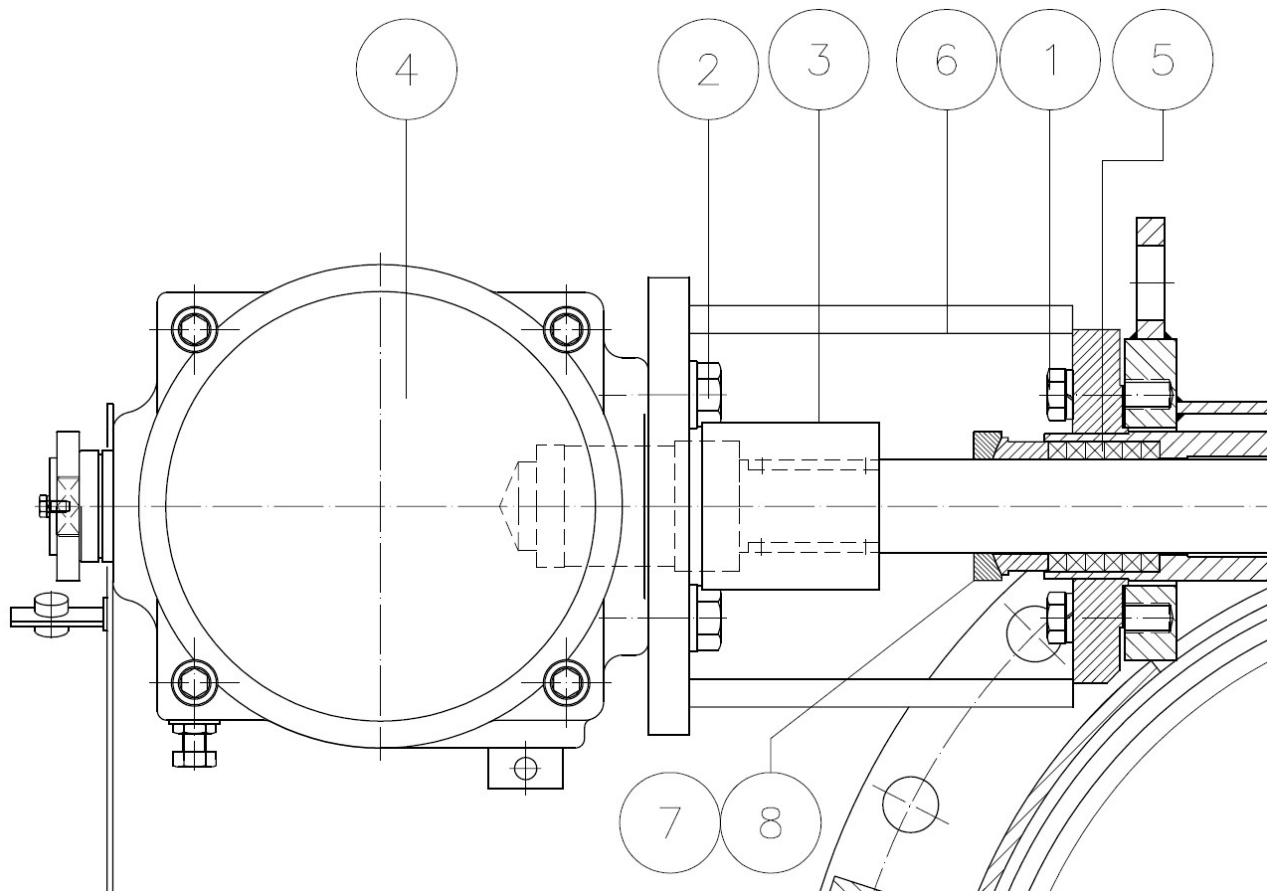
- The handling and maintenance of the valve must be carried out by qualified and trained personnel.
- Use appropriate personal protective equipment (PPE) (gloves, safety footwear...).
- Shut off all operating lines that affect the valve and place a warning sign saying work is being carried out on the valve.
- Isolate the valve completely from the process.
- Release process pressure.
- Drain the fluid from the valve.

The only maintenance required is to change the gland packing and the seal if the valve is a resilient seated type.

The useful life of these elements will depend on the working conditions of the valve such as pressure, temperature, abrasion, chemical action and number of operations.

5.1. Gland packing replacement

The gland packing set consists of 2 lines of synthetic packing made of 98% purity carbon filaments(MG-420) at each end, which wrap the preformed rings of pure mineral graphite (graphoil).



Depressurise the circuit before starting any kind of maintenance work.

1. Hold the cylinder with a crane or similar item.
2. Release the pneumatic cylinder(4) by loosening the nuts (2).
3. Remove the coupling piece (3) between the shaft and the cylinder. This piece is pinned to the shaft.
4. Release the supporting piece (6) by loosening the nuts (1).
5. Remove the gland follower(7)+(8) and extract the gland packing by means of a screwdriver or gland packing extractor. Make sure that the stuffing box remains clean.

5.1.1. Changing GRAFOIL packing

1. Position the new packing fitting the bottom line (MG-420) and all the grafoil rings without fitting the head line. Position the packing gland (6) and tighten the above-mentioned assembly with a torque of 20 N·m.
2. Remove the packing gland (6) and fit the head line (MG-420). Put the packing gland back (6) and tighten until the whole assembly is tightened.

3. Position the assembly composed of the support plate, cylinder and main lever. Proceed in reverse order from the disassembly for the assembly of the mentioned assembly.
4. Carry out some operations with a loaded circuit and retighten the packing gland (6), only enough to prevent leaks. This check can be carried out using soapy water.

5.1.2. Changing PTFE packing

1. The MH-245 PTFE packing rings are supplied as cut seams. Shape a ring with the seam and introduce in the stuffing box. Introduce always one ring at a time.



2. Introduce successive rings staggered and kept 180° apart. Each individual ring should be firmly seated with a tampering tool.
3. Position the assembly composed of the support plate, cylinder and main lever. Proceed in reverse order from the disassembly for the assembly of the mentioned assembly.
4. Carry out some operations with a loaded circuit and retighten the packing gland (6), only enough to prevent leaks. This check can be carried out using soapy water.

5.2. Seal replacement (resilient seated type valves only).

The reference seal HECKER AK-2749 is made of aramid fibre, rubber impregnated on both sides, and coated with a special material called "centellen". All this set also receives a graphite coating. This seal comes in the shape of a closed ring.

1. Extract the pipe from the valve.
2. Open the valve and hold the gate in open position preventing it from closing.
3. Remove the old seal by means of a screwdriver and thoroughly clean the groove where the new seal will be placed. This groove has a dovetail design.
4. Place the new seal in the groove so that it is supported along the whole perimeter.

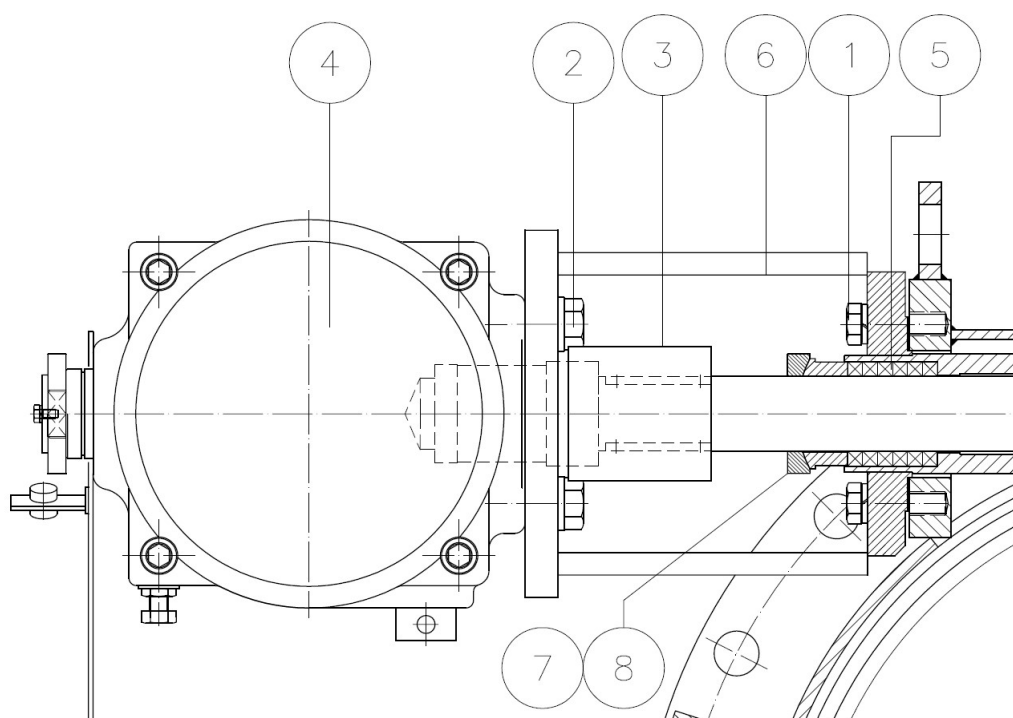


5. Carry out a few manoeuvres, as the disc, as it moves, will end up tightening the seal homogeneously in its housing.

5.3. Cylinder replacement

The replacement of an MI valve cylinder may be carried out while the circuit is functioning. To this end, we should bear in mind when the next manoeuvre will take place, so that we know how much time we have for the replacement (see the following diagram).

1. Close the air valve of the instruments of the pneumatic cylinder.
2. Dismount the wiring and piping elements which are connected to the cylinder.
3. With the valve in closed position, loosen the nuts (2) and extract the cylinder by using a crane or similar item.



6. STORAGE

Except for small sizes, these valves are packed individually.

After unloading, the valves must be stored in a well ventilated place and under a cover which protects them from dust, dirt and moisture.

If outdoor storage cannot be avoided, cover the valve and protect it from sources of heat, direct sunlight or the impact of rain. Provide good ventilation to avoid moisture.

7. ENVIRONMENTAL CONSIDERATIONS

The packaging is made from environmentally friendly materials. Dispose of the packaging through the available recycling channels

The valve is designed and manufactured with materials that can be recycled by specialised recycling firms. Once the life of the product is expired, you must consider a proper disposal of the product to prevent any negative impact on the environment and allows for the recycling of valuable commodities

Please follow the local environmental rules in your country for proper disposal

8. RESIDUAL RISKS AND ADDITIONAL CONSIDERATIONS

For a proper and safe use of the valve during its life please be aware of the following considerations:

- The valve has been designed for the fluid indicated in the quotation and order. If the fluid is going to be changed please contact ORBINOX to check the adequacy of the valve.
- The valve is not designed to withstand cyclic actions, seismic actions, fire or pipe actions.
- The valve is supplied without external isolation. When hot fluids are being transported the valve surface can be heated to high temperature values. Valve should be isolated, or the risk must be indicated in the installation.
- If the valve is supplied bare-shaft please contact ORBINOX to be sure that the selected actuator is valid for the application and the integrity of the valve.
- Check the compatibility of the valve material with the application, the environmental conditions and the pipe materials to avoid corrosion (general corrosion, galvanic corrosion) and the erosion of the valve. A corrosion allowance of 1 mm in thickness has been taken into account in the design of the valve. Check at least yearly the state of the valve.

9. DOCUMENTACIÓN

General Declaration of Conformity to the following Directives, if applicable, are available in the download section on Orbinox web page www.orbinox.com:

- 2006/42/CE: Machinery Directive

- 2014/68/EU: Pressure Equipment Directive for Category I

With specific order number:

- 2014/68/EU: Pressure Equipment Directive for Category II and III
- 2014/34/EU: Potentially Explosive Atmosphere (ATEX)

Contact Orbinox if these documents are required in other language than those available on the web page.