

<b>PIPELINE PROTECTION VALVES</b> DN 100 to 1000		13/02/2024
		<b>RPRRLXXNOT100</b>

## Operation and maintenance instructions for needle valve



### Storage instructions

#### Handling

The handling of the valve has to be made with care, in order to avoid any shock, even accidental, which could damage the coating. In particular during the lift of the valve chains, cables or ropes used for that specific operation must not be clamped or touch the shafts, the gearbox or its handwheel. Grab the valve by connecting the lift devices to the flanges or eyebolts (if present).

#### Storage

Valves are generally supplied with plugs at the extremities, or in pallets banded with plastic film; if the valves are without packing and have to stay for long time in the stock before being install, they must be stocked covering the passage of the valve, safeguarding in this way the interior parts and particularly the seat from the contact with powder or dirt. In absence of a right place the valves have to be wrapped with cellophane or rather dark plastic sheets.

The valves must be stored in a location offering a good protection from direct sun, rain and all other atmospheric agents (admissible temperature range: 0°C ÷ 50°C). Rubber parts and gaskets are light-sensible materials; in particular degradations may occur in case of sunlight exposition.

The valves must not weight on the shaft or on the gearbox, and if the valves have to be stacked in a pile, Is is suggested to avoid the contact between coated surfaces: a cardboard between the surfaces should be used.

#### Accessories and spare kits storage

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- **Gasket**

Normally rubber gaskets are sunlight sensitive. Therefore it is good practice to store rubber parts in sunlight protected areas, in order to avoid deteriorations. If such conditions are not available, rubber parts should be then at least protected with cellophane or rather dark plastic sheets.

- **Bolts**

The requested flange bolting is normally packed in a sack or sent in box equipped with a tag indicating the number and the type of the packed bolts. It is absolutely necessary to keep them in the original condition of delivery, avoiding putting them in contact with material which could damage them. Generally the bolting is slightly lubricated before delivery; any contact with dirt or dust could, in extreme cases, damage the threads and eventually prevent its mounting.

- **Actuators**

For this particular type of accessory, which is generally already mounted on the valve when delivered, it is necessary to pay attention that nobody, with the exception of the specialist or authorized people, could attempt to repair or manipulate it, this would take out any warranty covering these specific components. It is very important to check that the threaded orifices for the electric/hydraulic/pneumatic connections are always well protected with the original plugs until their use in final assembly. This will insure that no dirt, dust, humidity or any other external particle will damage the internal parts (gears, electrical coils, pistons, cylinders, seats, etc.). When the electrical wiring is not made immediately after the mechanical mounting of the valve in the pipe system, the installer/contractor will take the necessary measure to protect correctly and thoroughly the actuator against any atmospheric degradation and the built-up of condensation. Furthermore it is necessary to check periodically during this particular period of time the status of internal components, by removing the covers of the operative unit and of the reduction unit, protecting with silicone or oil vaseline the respective cover gaskets when remounting them.

## Installation instructions

### Preliminary inspection

Before mounting the valve in the pipeline, control that no dirt or dust or external particles are contained in the valve body and in particular that the valve seat is clean. Every clamping screw (mounted inside or outside the valve) should be checked and every loosened screw should be tightened.

One complete cycle of opening/closing of the valve has to be made in order to check that all components ensuring these specific operations are working correctly.

### Mounting

The mounting of every valve has to be effectuated without pressure in the pipe. A sufficient space should be provided around the valve to permit its usual operation, as well as any eventual setting or future maintenance work.

It is good practice to include a dismantling joint usually mounted at the downstream side of the valve. Thanks to its adjustable length range it is not needed a very precise mounting between the pipe flanges. The dismantling joint is also used to check the status of the valve: without dismantling the valve from the conduit it is possible an internal inspection.

The needle valve is usually set horizontally; contact SGC for any vertical installation.

The pipeline should be as free as possible from welding, scraps, mounting accessories, dirt, etc. The cleanest the pipe is kept during the installation, the less trouble will be caused. Afterwards if the transported fluid in the system contains a lot of external solid particles, it is recommended to install in the upstream side of the valve a strainer.

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Both pipe flanges, which are connected to the valve, should be located perfectly in the centreline of the pipe and absolutely parallel. If no dismantling joint is used in the mounting procedure of the valve, the distance between the two pipe flanges should match the overall length given by the valve manufacturer including twice the thickness of the flange gaskets. Any longer distance between the two pipe flanges (even few mm) can produce cracks during the tightening of the flange bolts/nuts due to very high yield stress on the valve.

If the valves have an electric actuator, it is necessary to check the handbook published by the actuator producer. Before the installation it will be necessary to prepare the electric control board (if not required on the order) and to do the electric connections.

The electric connections must take into account the right positioning of motor phases, following the wiring drawing, to avoid the opposite rotation that can cause also damages to the valve. In this case a closing rotation will push the shutter against the body seat, but if the limit or torque switch will not work, the mechanical effort created by the motor will produce the rupture of one of the components forming the driving assembly.

### Start up

After the mounting of the valves on the pipeline it must be verified that the coating has not been damaged. In case of damages it is recommended to repair the coating to avoid corrosion.

The flow direction must be respected according to the arrow moulded on the body valve. Inverse-flow is admitted only for short transient-time-periods and if the valve is completely opened.

In case of motorized version, the electrical actuator is normally tested and set-up in the factory when it is assembled on the valve. However, after having checked carefully the electrical wiring, It is necessary to operate the valve a few times for controlling its perfect operation. It is further recommended to start the electrical tests with the shutter in the intermediate position to check the right correspondence between the signal given by pushing the control and the effective manoeuvre of the valve shutter (eg. closing control button closing movement of the shutter).

## Operations instructions

### Manoeuvre

The manoeuvre of the valve is driven by a worm type gearbox mounted externally to the body and connected through the shaft. The operation movement is slow enough in order to avoid water hammer fluctuations.

In case of electric actuator, the time of manoeuvre has to be communicated pre-emptively by the customer before the order (it will be not responsibility by producer any further modification of the manoeuvre time).

The standard UNI EN 1074-1-2 fixes the maximum admitted torque  $C_{max}$  during the manoeuvre without damaging of the valve (example: with handwheel  $C_{max} = F \cdot D_{handwheel}$  where  $F$  is the applied force).

### Exercise condition

The standard UNI EN 1074-1-2 fixes the maximum speed of water in the valve:

PFA (bar)	10	16	25
Max speed of water (m/s)	3	4	5

The same standard fixes also the allowable water temperature: from 0°C (excluded freezing point) to 40°C.

The needle valve is a modulating device, so it can control the water flow-rate gradually.

To avoid cavitations troubles and to grant a long-life of the valve It is necessary to respect the instructions given by Saint-Gobain Condotte.

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## Maintenance instructions

### Ordinary maintenance

The needle valves are designed, manufactured and tested to guarantee the maximum reliability and endurance. In the standard version the choosing of materials is made paying attention to usual type of fluid and common hydraulic conditions: all the parts subjected to usury are perfectly self-lubricated and do not need particular maintenance. If the valves must work in extreme conditions, special version must be ordered.

The efficiency of hydraulic equipments during their life is generally connected to the exercise conditions and to the type of fluid. It is good practice to plan periodical inspection according to the type of valve and to the hydraulic conditions.

If the valve is used with the shutter in an intermediate position, to maintain the performances in the time, It is suggested to do at less one complete cycle of opening/closing manoeuvre every year to reduce incrustations and sediments that can accumulate during the exercise. It is also necessary to verify periodically the conditions of the boundary conditions (pressure, velocity and discharge) that may jeopardize the valve (cavitation, gaskets usury, damages of internal mechanic parts).

Operation	Year 0,5	Year 1	Year 1,5	Year 2	Year 2,5	After 5 years
Cycle of manoeuvre (op. - cl.)	yes	yes	yes	yes	yes	One cycle every year
Verify the clamping of bolts of flanges and gearbox	yes	yes	yes	yes	yes	Control at every inspection
Seat control	yes	yes	yes	yes	yes	Control at every inspection

### Extraordinary maintenance

In presence of particular exercise conditions (not filtered or particularly aggressive water, incrustations) or damage due to external cause, It is possible that operations of extraordinary maintenance may be necessary. These operations of extraordinary maintenance that can be made directly on site include the replacement of seal gaskets. Other operations (replacement of the shutter, shaft ...) are very exceptional and are not described in this manual (contact our technical department for further information).

All these operations have to be effectuated after the complete emptying of the pipeline (total absence of flow and pressure) to avoid any risk to the people during this operations. Remember to remove gradually the bolts only after the clamping of the valve lifting device.

### Gasket kit

The kit contains

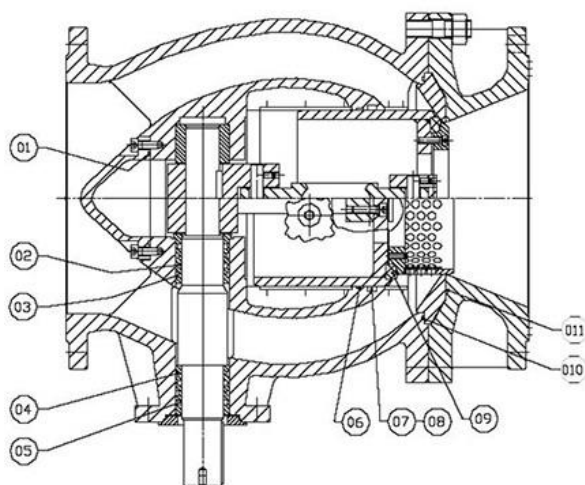
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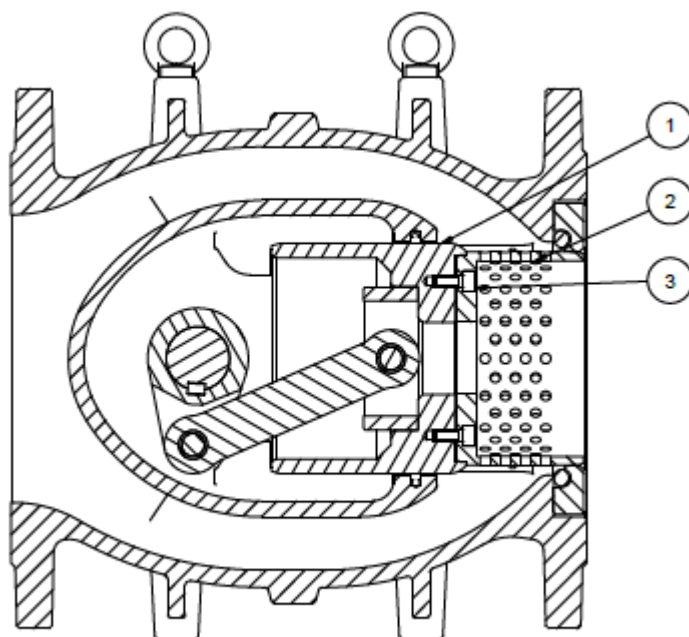


Ref	Description	Material
1 - 2 - 3 - 4 - 5 - 7 - 10 - 11	O-ring	EPDM
6	Slide ring	PTFE + carbon
8	Back up ring	Lubriflon
9	Sealing ring	EPDM

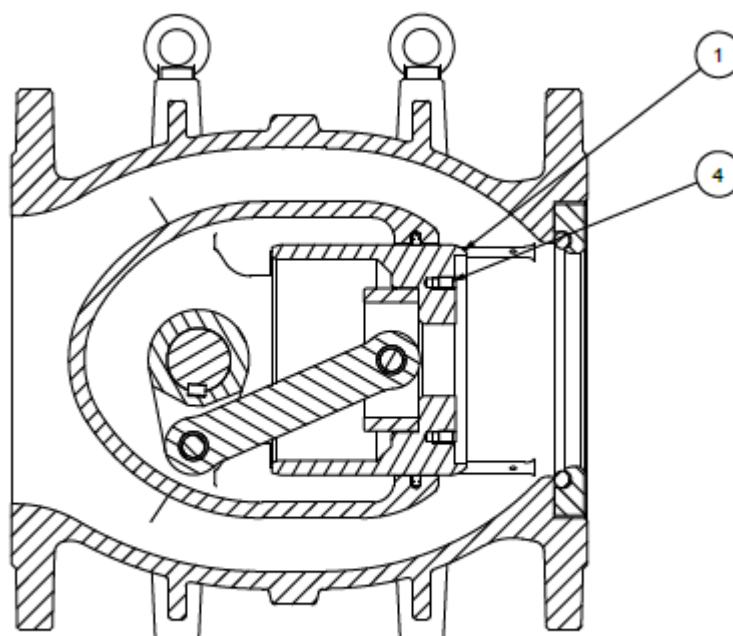
## Instructions for assembly and replacement of anti-cavitation cylinders



- Empty the pipeline completely
- Fully open the valve via the handwheel or actuator; cylinder mounting/replacement does not have to be done with valve closed or partially open (Fig. 1-2)



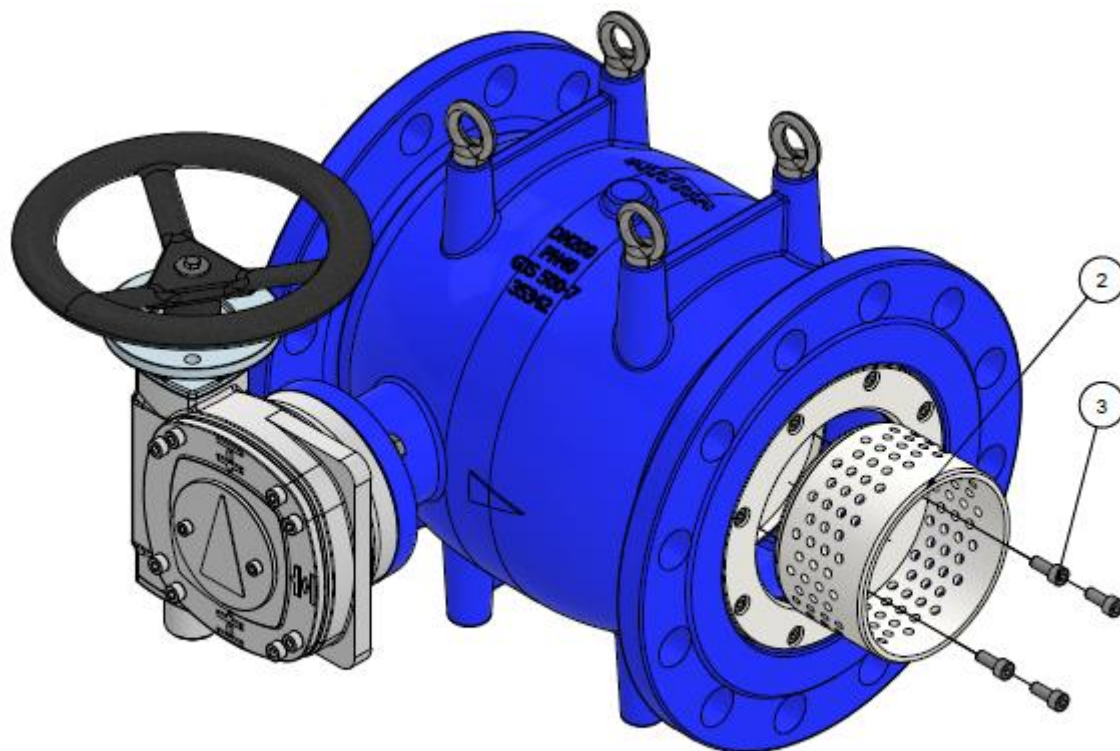
**FIG. 1 Valve fully open with cylinder**



**FIG. 2 Valve fully open without cylinder**

- If possible, remove the valve from the pipeline and position it vertically with the flange resting on a stable horizontal surface, to ensure a perfect alignment. If not possible, simply disassemble the pipe downstream of the valve to have access to the cylinder (2)
- Make sure there is no dirt inside the valve and remove any dust from the shutter (1)
- Unscrew the fixing screws (3) of the cylinder to be replaced (2) or the grains from the bolt threaded holes (4)
- Insert the new cylinder into the valve (Fig. 3), making sure that it slides without seizing throughout the entire stroke





**FIG. 3 Assembly/replacement of anticavitation cylinder**

- Place the cylinder (2) on the shutter (1) and tighten the screws (3); the cylinder should not extend beyond the valve ring when fully open. Use Tab. 1 for tightening torque of the screws
- Before remounting the pipeline, one complete cycle of opening/closing should be made to check that the cylinder is mounted correctly, and it slides without seizing
- Refit the valve in the pipeline

**Tab. 1 Tightening torque for cylinder screws [Nm]**

	<b>M8</b>	<b>M10</b>	<b>M12</b>	<b>M16</b>	<b>M20</b>
<b>Torque</b>	20	28	65	123	240

**FOR ANY FURTHER TECHNICAL INFORMATION PLEASE CONSULT SAINT-GOBAIN PAM ITALY AND/OR OTHER SISTER COMPANIES**