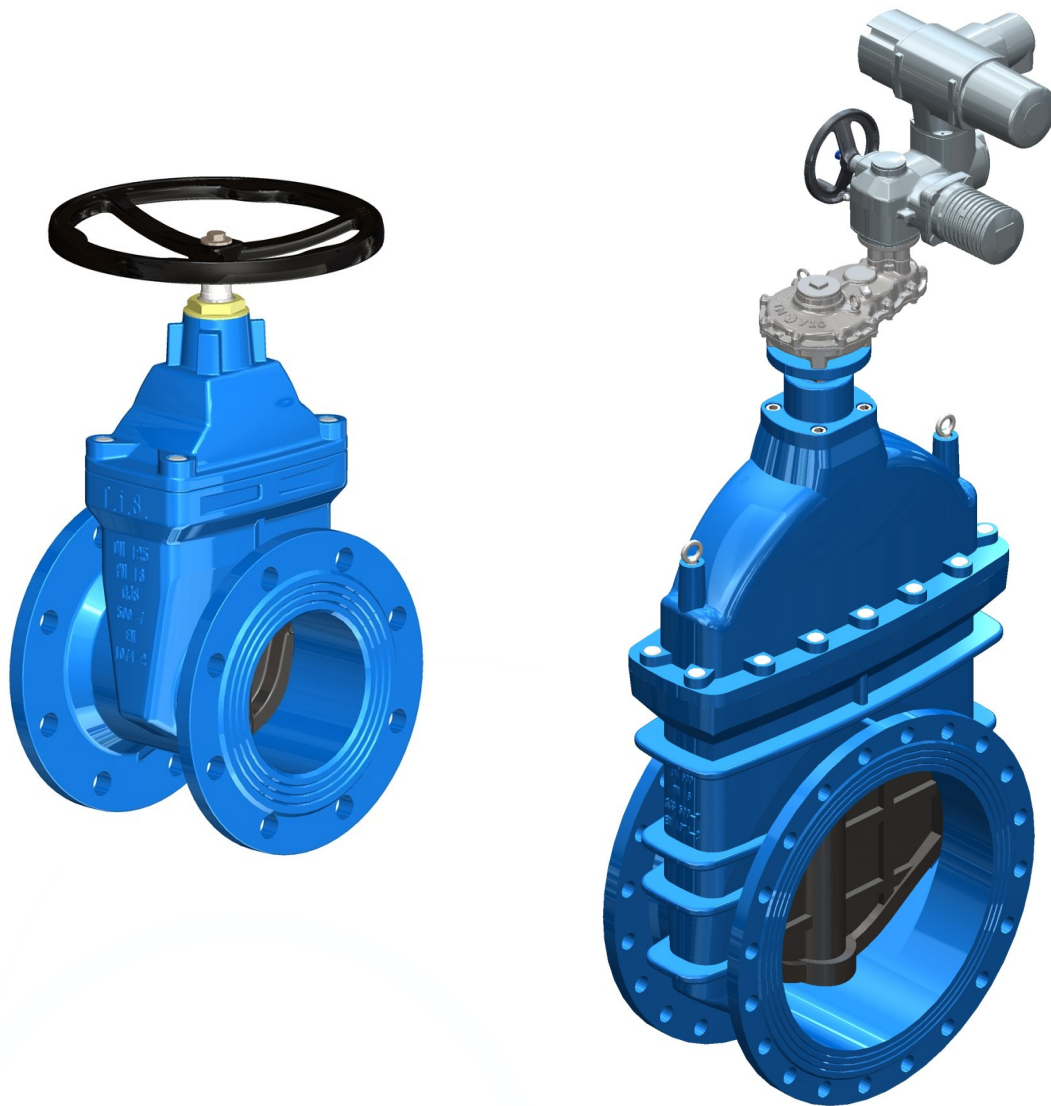




OPERATING AND MAINTENANCE INSTRUCTIONS FOR SOFT SEATED GATE VALVE

Art. A020-A021-A022-A023-A025





OPERATING AND MAINTENANCE INSTRUCTIONS FOR RESILIENT SEATED GATE VALVE

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0. General

Read the present operating and maintenance instructions thoroughly before any operations on the valve.

The instructions include all the necessary information for safe installation, operation and maintenance.

Any applicable safety requirements must be complied with before commissioning the valve. The valve must only be operated by qualified and trained staff over 18 years of age.

If maintenance work is not conducted, or is effected inadequately, the manufacturer declines all responsibility and the warranty obligations set out in the terms and conditions of delivery no longer apply.

Only original spare parts supplied by our company ensure top quality and full compatibility.

The manufacturer prohibits any unauthorized modifications to the valve. Any modifications implemented autonomously by users invalidate the manufacturer's warranty on the valve!

We reserve the right to make technical modifications relative to the data and representations in the present Operating and Maintenance Instructions when necessary to improve the valves.

The main features of T.I.S. valves are set out in the table below. Any deviations from the operating instructions or field of application must be approved in advance by the manufacturer.

TECHNICAL DESCRIPTION OF VALVES	
VALVE ID.	A020 (F4-PN10), A021 (F4-PN16), A022 (F5-PN10), A023 (F5-PN16), A025 (PN25)
NOMINAL DIAMETER	DN40 to DN800 (PN10-PN16) - DN40 to DN400 (PN25)
FACE-TO-FACE DIMENSIONS	EN 558 SERIES 14 and 15
FLANGE TYPE	EN 1092-2
OPERATING PRESSURE	PN10, PN 16, PN25
OPERATING TEMPERATURE	MAX. +70°C
COATING	EPOXY
APPLICATION	WATER
TEST STANDARDS	EN 12266-1
OPERATION	MANUAL / ELECTRIC



1. Introduction

The resilient seated gate valve is an isolating device (for “OPEN-CLOSE” operation) consisting of a flanged body housing, suitable guides formed in the body, and a sliding wedge covered with rubber.

The bonnet is screw fixed to the body and houses the necessary mechanisms for opening and closing the wedge. The valve is closed by turning the handwheel clockwise.

The gate valve is mainly used as an isolating device on systems for water treatment, transport, and distribution and is generally used in either the open or closed positions and in both flow directions.

2. Safety instructions

T.I.S. valves are designed and manufactured to the highest standards and their operating safety is extremely reliable. However, all valves can be potentially dangerous if they are operated improperly or installed contrary to their intended use.

Arbitrary alterations to the valve and any parts supplied with it are not allowed. T.I.S. Service S.p.A. declines all responsibility for any damage deriving from a failure to comply with these instructions. The acknowledged standards of good technical practice must be applied when using these valves.

Before removing any protective devices and/or performing any work on the valves, depressurize the pipeline section relevant to the work and ensure it is free of hazards. Unauthorized, unintentional and unexpected actuation, as well as any hazardous movements caused by stored energy (pressurized air, water under pressure), must be prevented. When a valve needs to be dismantled from a pipeline, fluid may be released from the pipeline or valve. The pipeline must be emptied completely before the valve is dismantled. Special care needs to be taken in the case of any residual fluids that might continue to be released.

After completing the installation/maintenance work and before operation, check that all the connections are tight. Couplings and connections must never be disassembled while they are under pressure.

Servicing and inspection work must only be conducted by qualified personnel. The plant operator and employer are responsible for ensuring that the personnel are suitable and qualified for the work.

The plant operator must also ensure that all personnel understand the present operating and maintenance instructions.

Protective equipment including safety boots, safety helmets, goggles, protective gloves etc. must be worn during all work for which these are necessary or prescribed.



In addition to the present operating and maintenance instructions, the obligatory accident prevention regulations applicable in the country of use and at the installation site, personnel must also comply with approved good technical and safety practices for each specific operation.

The personnel must be familiar with local rules regarding safety and accident prevention.



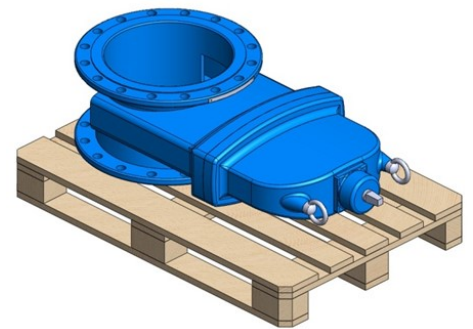
3. Identification

In compliance with EN 19, all the valves have cast markings that indicate nominal diameter (ND), nominal pressure (NP), body material, and the manufacturer's logo.

4. Storage

The gate valve should be stored with the wedge slightly open. The elastomeric parts (seals) must be protected against direct sunlight and/or UV light, which could compromise their long-term sealing properties. Store the valve in a dry well-ventilated place and avoid direct sources of heat. Cover to adequately protect the important parts for correct operation, like the wedge and the body seal, from dust and other dirt.

Do not remove the protective covers on the connection flanges or the packing materials until immediately before fitting on the pipeline. The valve can be stored in ambient temperatures ranging from -10°C to $+50^{\circ}\text{C}$ (protected by adequate covers). If the valve is stored at temperatures below 0°C , it should be warmed up to at least $+5^{\circ}\text{C}$ before installation and before being put into operation.



5. Transport and lifting

Transport must be conducted with care. Inexpert handling can damage the valve and harm people. Any damage due to transport or handling must be suitably repaired before installation.

For transportation to the installation site, the valve must be protected inside stable packing materials adequate for the size of the valve. The valve must be protected from atmospheric agents and external damage.

If the valve is shipped under extreme climatic conditions (e.g. marine transport), it must be specially protected with plastic film wrapping and a desiccant must be included. The protective coating on the valve and other elements must be shielded against damage by external agents during transport and storage. The gate valve should be transported with the wedge slightly open.

For the gate valve weights, please refer to the relevant data sheet.

When transporting or fitting valves, in particular those that are too heavy for manual handling, the lifting elements like cables or slings must only be positioned around the valve body between the two connection flanges, or connected to the eyebolts or other lifting points provided for this purpose.

The length and position of the cables/slings must ensure that the valve remains in a vertical position during the entire lifting procedure.

It is not permitted to attach lifting elements to the handwheel, stem, gearbox case, or through the flange holes, which would contravene the relevant safety regulations.





6. Installation

Do not remove the protective flange covers until immediately before installing the valve.

Before installing, visually examine all functional parts of the valve for damage during transport and storage, and then completely open and close it at least once to check that it is operating perfectly. Check that the elements essential for correct operation, including the wedge and the body guide channels, are free of any foreign materials.

Ensure that there is adequate space available for fitting and maintenance work. The access to the valve must enable work using all the appropriate technical means (tools, measuring instruments, etc.)

The user must provide adequate instructions to ensure the work area is clean and orderly.

Welding work on the pipeline must be performed before valves are installed to avoid damage to the sealing elements and the surface coating. Welding residue must be removed before the equipment is put into operation.

T.I.S. Service S.P.A. does not accept any responsibility for damage deriving from dirt, sand or shot-blasting residues, etc. During installation of the valve, the distance between the pipe flanges should exceed the valve face-to-face dimension by at least 20 mm. This avoids damage to the flange faces and the sealing elements can easily be inserted. The mating pipe flanges must be plane-parallel and concentric, if not, they must be aligned before installing the valve. Failure in this could result in unacceptably high loads acting on the valve body during operation, leading to breakage. Do not use the valve as an anchor point for the pipeline.

Larger nominal size valves must be ensured robust stability, is necessary with bolted fixture.

In no circumstances must the pipeline be drawn towards the valve and no axial traction or pressure must be transmitted to the valve from the pipeline. If the gap between the valve and pipe flange is too wide, this must be compensated with thicker sealing elements or dismantling joints.

When fitting on drinking water pipelines, always use drinking water approved sealing materials, lubricants, and work materials.

Bolt the valve to the pipeline flanges using hexagonal head screws, nuts, and washers. Tighten the connecting bolts evenly and crosswise, without causing unnecessary tensions and the associated risk of cracking or breaking. Never over-tighten the flange bolts, which could crack the flanges. If the valve is installed in the open, it must be adequately covered to protect it against extreme atmospheric agents (e.g. formation of ice).

If work generating airborne soiling is being conducted near to the valve (e.g. painting, masonry or concrete work), the valve must be adequately covered for protection.

Newly installed pipeline systems must be thoroughly purged to remove all foreign substances before the valve is operated. Residues and dirt particles in the pipeline can impair the operation of the valve by hindering its freedom of movement or permanently damaging its internal components.

In particular, after repair work or the installation of a new valve, the pipeline must again be purged with the valve fully open. If detergents or disinfectants are to be used, first check that these will not harm the valve materials.



7. Commissioning and operation

After installation on the pipeline, check that the valve is operating smoothly by moving it through its full range of travel (OPEN – CLOSED) using the control device.

Auxiliary equipment (hand crank, electric actuator, etc.) can be used to facilitate this. As standard, the valve is closed by turning the control device in the clockwise direction.

The sizing of the stems and actuators allows the valve to be operated by one person using the handwheel. Lever extensions on the control device designed to increase the closure force are prohibited since they could damage the valve.

Electrically operated valves must be manually shifted to the central position before they are activated. Valves installed according to the instructions pose no immediate danger.

Vibrations can compromise sealing elements and screwed connections, resulting in the escape of the flow medium and resulting risk of fire or explosion due to electrical contact. There may be a risk of poisoning (by inhalation) and biological or microbiological hazards (depending on the fluid composition).



- Do not exceed the maximum admissible temperature for the equipment.
- Do not exceed the maximum admissible operating overpressure.
- Do not load a closed valve beyond its maximum admissible nominal pressure.
- Do not install this valve as a line termination valve.
- Do not extend the control devices (e.g. with a lever).

Users are responsible for providing appropriate safety devices to ensure that the maximum valve design pressure is not exceeded.

Maximum permitted flow velocity: up to 3 m/s for PN10, 4 m/s for PN16, and 5 m/s for PN25 and superior. The gate valve is a bidirectional shut-off valve, designed for installation in pipelines.

The gate valve should only be used with media that pose no risk of clogging.

The manufacturer's prior written approval must be obtained for any other operating conditions and applications!

Standard gate valves are equipped with EPDM seals and the EPDM elements must not be allowed to come into contact with oil or grease.



Continuous operation in an intermediate flow-regulating position causes rapid wear on internal components. This type of gate valve is only suitable for "OPEN-CLOSED" operation. Different, specifically designed valve types must be used for flow regulation.

8. Maintenance

T.I.S. gate valves are maintenance free when used in standard operating conditions. At least every six months it is recommended to conduct a visual inspection of the valve, its surface coating, and general condition, check the tightness of the pipe connection screws, and shift the valve once through its complete range of movement checking its smooth operation and correct seal.

Under extreme operating conditions (highly abrasive medium, high hydraulic flow rates, or marked pressure variations) it should be inspected more frequently.

Proceed as follows if the gate wedge needs to be replaced:



Replacing the wedge:

- 1) Depressurize the line where the gate valve is fitted, slightly open the valve and detach the handwheel (or other controls);
- 2) Unscrew bonnet bolts and remove bonnets;
- 3) Replace damaged wedge and stem nut and if necessary also change the profile seal;
- 4) Re-assemble the bonnet and tighten the bolts.

9. Troubleshooting

Problem	Cause	Action
Gate valve does not close	Stem nut defective	Replace stem nut
	Foreign particles jamming wedge or stem nut	Eliminate foreign materials
	Worn or damaged wedge	Replace wedge
	Stem distorted	Replace stem
	Heavy deposits on the sliding surfaces	Clean sliding surfaces
Gate valve does not open	Stem nut defective	Replace stem nut
	Foreign particles jamming wedge or stem nut	Eliminate foreign materials
	Stem distorted	Replace stem
Leakage between cover/bonnet	Bonnet bolts not correctly tightened	Tighten the screw
	Defective/worn profile seal	Replace profile seal
Gate valve leaks at the stem bushing	Defective/worn o-rings	Replace O-rings



10. Disposal and recycling

T.I.S. valves are designed and constructed to ensure an extremely long operating life.

At the end of their operating life they must be removed/replaced and disassembled with each component separated and sorted according to materials, for example:

- various metals;
- plastics components;
- greases and oils;
- electronic components.

Generally the following rules apply:

- During disassembly, carefully collect any oil and grease, since these are hazardous for water and must not be released into the environment.
- Arrange for controlled waste disposal or recycling according to the materials.



Obey all local government regulations for waste disposal/recycling.

11. Contacts

Spare parts or accessories can be obtained from T.I.S. SERVICE sales departments.

T.I.S. SERVICE S.P.A.

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The manufacturer reserves the right to introduce technical changes to the data contained in these Operating and Maintenance Instructions when this is considered necessary to improve the valves.

The illustrations and drawings of products in this manual are merely indicative and are intended only as exemplifications of the valve configurations.