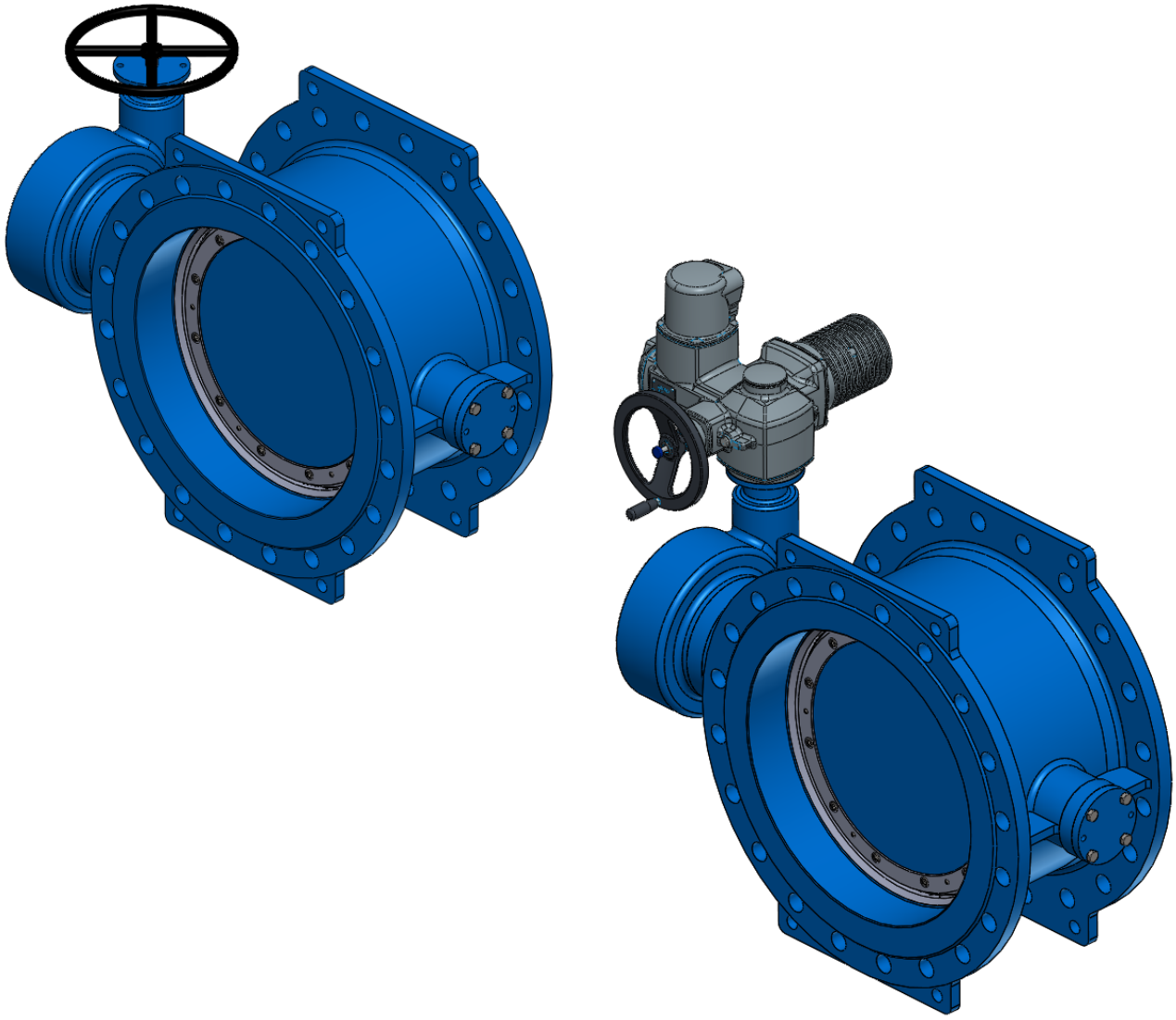
OPERATING AND MAINTENANCE INSTRUCTIONS FOR DOUBLE ECCENTRIC BUTTERFLY VALVE

Art. D140-D141-D142



OPERATING AND MAINTENANCE INSTRUCTIONS FOR DOUBLE ECCENTRIC BUTTERFLY VALVE

INDEX

0. General

Observing these operation and maintenance instructions, helps you to improve the operational safety and useful life of the equipment, prevent hazards and reduce repair costs and down-time of the valve.

ANY OPERATION PERFORMED NOT RESPECTING THIS OPERATION AND MAINTENANCE INSTRUCTIONS, COULD GIVE RISE TO DANGERS AND INVALIDATE THE MANUFACTURER'S WARRANTY.

Butterfly valve is shut-off valve designed for installation in pipelines but could be used as a control valve only within certain limits. The design of the butterfly valve is that of an eccentric valve with a double offset bearing of the disc. In closed position, the disc is perpendicular to the direction of flow. To close or open the valve, the disc must be turned by 90°.
The body is sealed with an endless profile seal ring which in the standard version is fixed by a retaining ring. In closed position, the elastic profile sealing ring is pressed to the conical seat surface inside the body and safely seals in both flow directions.
Due to the double offset bearing of the disc, the profile seal ring is completely unstressed when the valve is in open position.

For any deviating operating conditions and applications, the manufacturer's written approval must be obtained.

TECHNICAL DESCRIPTION OF VALVES	
VALVES CODES	D140 - D141 - D142
NOMINAL DIAMETER SIZE	DN150 TO DN2000
FACE-TO-FACE DIMENSIONS	EN 558 SERIES 14
FLANGE TYPE	EN 1092-2
WORKING PRESSURE	PN10, PN16, PN25
WORKING TEMPERATURE	Min 0°C Max 70°C
COATING	EPOXY
APPLICATION	DRINKABLE WATER COOLING WATER WARM WATER
TEST STANDARDS	EN 12266-1
OPERATING	MANUALLY / ELECTRIC ACTUATOR

1. Safety

TIS valves are designed and manufactured to the highest standards and their safety of operation is generally ensured. However, valves may be potentially dangerous if they are operated improperly or are not installed for their intended use; unauthorized, unintentional and unexpected actuation as well as any hazardous movements caused by stored energy (pressurized air, water under pressure) must be prevented.

Arbitrary alterations of this product and the parts supplied with it are not allowed.

La TIS Service S.p.A. will not assume any liability for consequential damage due to non-compliance with these instructions. When using this valve, the generally acknowledged rules of technology have to be observed. However, these valves can be a danger when handled by untrained staff, so:

installation, servicing, maintenance and inspection work (as well as the replacement of spare parts of the valve) is forbidden for not qualified staff.

The plant operator is responsible for determining the suitability of the staff or for ensuring the relevant qualifications. In addition to this, the plant operator needs to ensure that all employees have understood these operation and maintenance instruction.

Before performing any operation on the pipe or on the valve, make sure that the pipeline section be free of hydraulic loads; couplings and connections must never be disassembled when they are under pressure.
Before dismantling the valve, the pipeline must be completely emptied; carry out the complete emptying of all the duct concerned, special care needs to be taken in case of residue which may continue flowing.
After completing the maintenance works and before resuming operation, check all connections for tightness.
If work is carried out in the vicinity of the valve, which leads to soiling (concrete work, masonry, painting, sandblasting), the valve must be covered effectively.
If the valve is installed as an end-line valve, it must be ensured that the free outlet side will not accessible to interference from any source.

2. Transport and storage

2.1. Transport

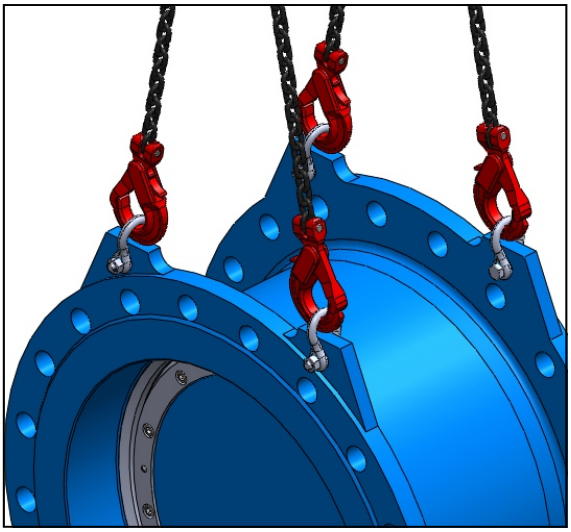
Transport has to be carried out carefully; inexpert handling may cause damages to the valve.

For transportation to its installation site, the valve must be packed in stable packaging material suitable for the size of the valve. It must be ensured that the valve is protected against atmospheric influences and external damage.
When the valve is shipped under specific climatic conditions (e.g. overseas transport), it must be specially protected and wrapped in plastic film and a desiccant must be added.
The factory-applied corrosion protection and any assemblies must be protected against damage by external influences during transport and storage.

Butterfly valve must be transported with its disc slightly open.

If the valve is equipped with actuation assemblies, make sure the actuators are safely stored to prevent transverse loads from affecting the connections.
For the weights of the butterfly valves, please refer to the datasheets.

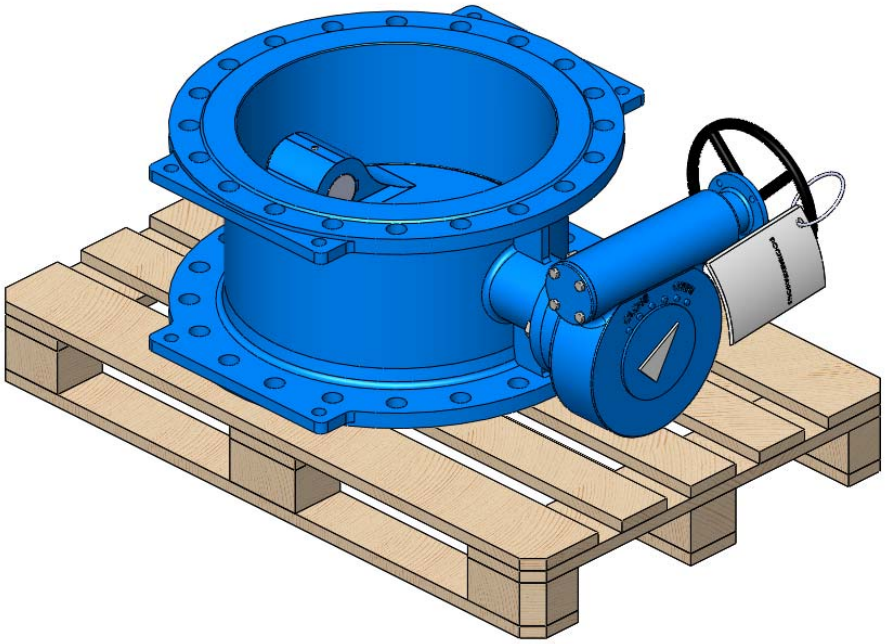
For transport purposes and also to support assembly, eye bolts can be used for lifting if present. If not, for manipulation should be used transport belts. The disc, the actuator or the gearbox are unsuitable for this purpose. The length and positioning of the cables/belts must ensure that the valve is in a horizontal position during the entire lifting procedure.



A butterfly valve without visible transport damages should be left in the factory packaging during storage and transport, and only unpacked immediately before installation in the pipe section.
Prior to mounting, such damages are to be repaired in an appropriate manner.

2.2. Storage

The elastomeric parts (seals) must be protected against direct sunlight and/or UV light as otherwise their long-term sealing function cannot be guaranteed. Store the valve in a dry and well aerated place and avoid direct heat. Protect any assembly units important for proper function such as the disc and the body seal against dust and other dirt by adequate covering.
The valve can be stored in ambient temperatures ranging from -10°C to +50 °C (protected by adequate covers). If the valve is stored at temperatures below 0 °C, it should be warmed up to at least +5° C before installation and before it is put into operation.



3. Identification

According to EN 19, on all the valves is casted the nominal diameter (DN), the nominal pressure (PN), the body material and the manufacturer's logo.

4. Proper use and function description

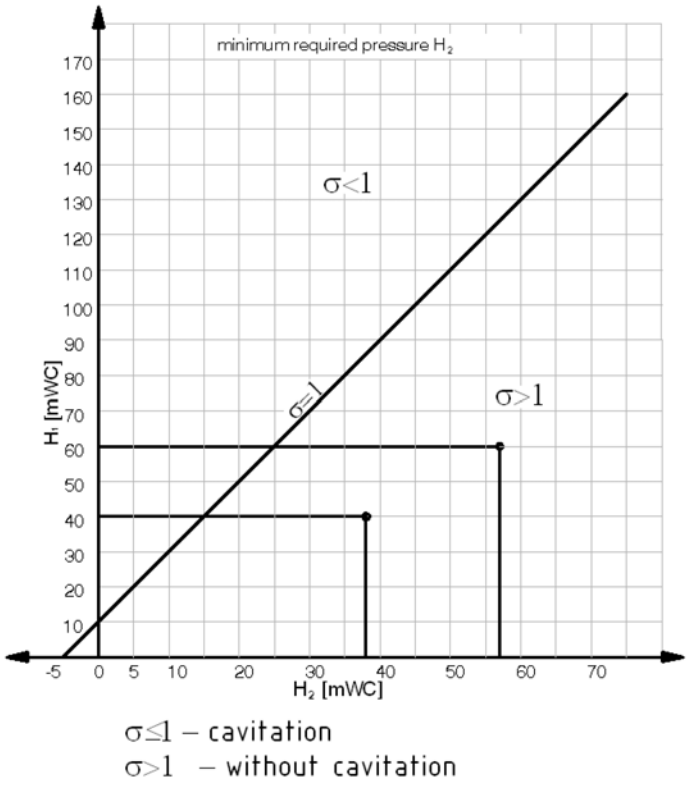
The Butterfly Valve is a shut-off bidirectional valve designed for installation in pipelines with media liquid temperature up to 70°C. It is not permissible to use the valve with media containing gas or oil; it can be used for the following media: water, raw and cooling water (with appropriate corrosion protection).
Is recommended to use only in media in which there is no risk of clogging.
For the respective technical application ranges please refer to the rating plate is attached on coupling flange.
Butterfly valve is used between two flanges in a pipeline. Reliable sealing is secured by hard leaning of the disk on the body sealing surface. Sealing ring is on the valve disk. Sealing ring is supported by retaining ring and disc. In closed position, the elastic profile sealing ring is pressed to the conical seat surface inside the body providing safe sealing in both flow directions. Profile seal ring is completely unstressed when the valve is in open position and can be disassembled without having to dismantle the valve. Butterfly valve can be operated manually or by electric gearbox.
For any deviating operating conditions and applications, the manufacturer's written approval must be obtained!

4.1 Performance limits

Butterfly valves are mainly used to shut off the flow. If a butterfly valve is used to control the flow, the operational limits of the maximum flow velocity as well as the cavitation must be observed.

Cavitation limits
H1 - inlet pressure
H2 - outlet pressure

If the computed σ- value lies above the limit curves of σ=1, cavitation will occur (Picture 4.). As possible solution we recommend changing the back pressure or choosing a different place of installation.
If cracking, noises of vibrations occur while the valve is being put into operation; the actual operation conditions should be checked. Below 10-100%opening degree (which is recommended), no reasonable control can be guaranteed.



Maximum permissible flow velocity
According to EN 593 Table 3, butterfly valves are designed for the specific velocities in liquid media as shown in the following table .

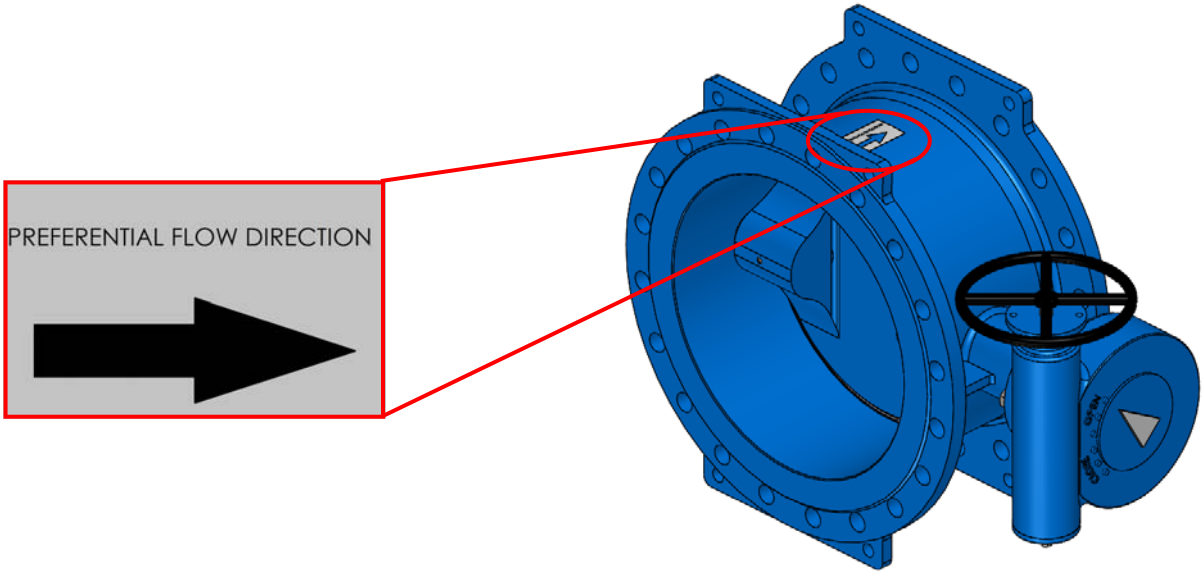
PN	Recomended flow velocity m/s
10	3
16	4
25	5

5. Installation

Before putting the valve and the equipment into operation, perform a visual inspection of all functional parts. Possible damages may occur during transport and storage.
During the installation, sufficient space for function checks and maintenance work has to be provided.
Prior to installation, the valve have to be opened and closed completely at least once and should be checked for trouble-free operation. All components essential for proper function, such as the seat and the sealing ring of the disc must be thoroughly cleaned to remove all dirt particles.

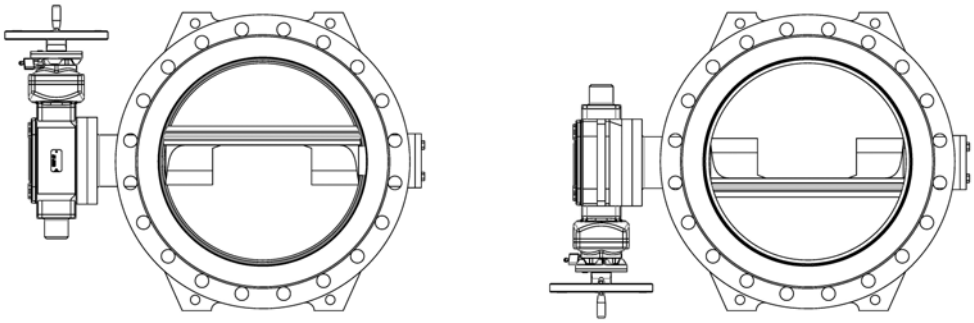
In case of works around the valve causing dirt (e.g. painting, masonry or working with concrete), the valve must be protected by adequate covering. Welding works on the pipeline must be performed before the valves are installed to prevent damage to the seals and the corrosion protection. Newly installed pipeline systems should first be thoroughly purged to remove all foreign particles. Residue or dirt particles present in the pipeline may impair the function of the valve or prevent its free movement.
In particular after repair work or upon the commissioning of new equipment, the pipeline system should be purged again with the valve being fully open position. If detergents or disinfectants are used it must be ensured they do not attack the valve materials.
Welding residue must be removed before the equipment is put into operation.
La TIS Service S.p.A. does not assume any liability for consequential damage caused by dirt, shot-blasting gravel residues, etc.
When installing the valve between two pipeline flanges, these must be coplanar and in alignment.
If the pipes are not in alignment, they must be aligned before installation of the valve, as otherwise this may result in impermissibly high loads acting on the valve body during operation, which may eventually even lead to fracture. Do not use the valve as the anchor point of the pipeline. The space between the flanges must be large enough so as not to damage the coating of the raised face of the flange during installation.
The flanges of the pipeline must not be pulled towards the valve during installation. Should the gap between valve and flange be too wide, this should be compensated by thicker seals or by dismantling joint.

Butterfly valves of all nominal widths must be installed in horizontal position and according to the preferential flow direction; even if they are bi-directional valves, the constructor suggests to follow the flow direction indicated on the silver label placed on the top of the body valve in order to ensure the excellent operation of the same (see picture below).

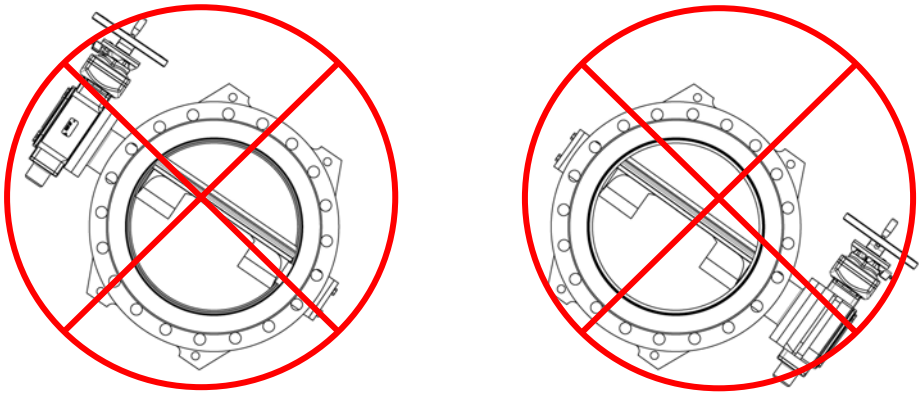


For assembly in drinking water pipelines, suitable sealing materials, lubricants and process materials must be used which are approved for use in drinking water pipelines.
When connecting the valve with the pipeline flanges, hexagon bolts and nuts with washers from flange to flange must be used in the through holes. Fasten the bolts evenly and crosswise to prevent unnecessary tension and the resulting cracks or breaks. Do not over-tighten the bolts of the flanges as this may result in the flanges cracking.
If the valve is installed in the open, it must be protected against extreme atmospheric influences (e.g. formation of ice) by adequate covers; for underground installations, the gear must be equipped with a protection for buried installation.

5.1 Correct positioning in the pipeline

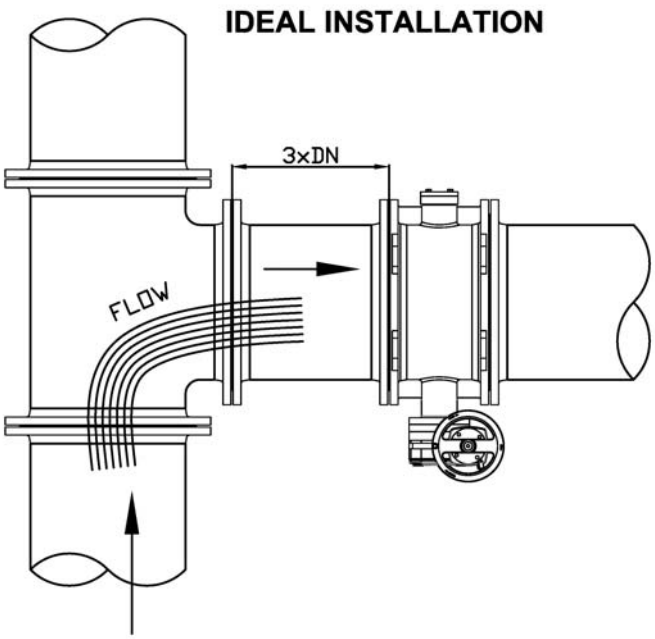


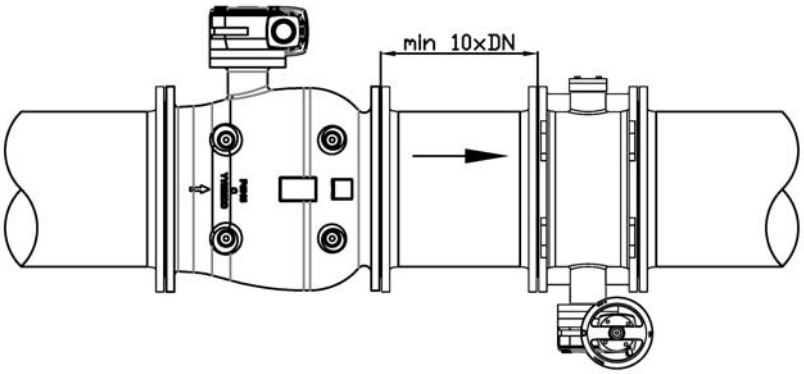
Horizontal installation position is recommended for all butterfly valves with the gearbox facing up or down (see the picture above).



Vertical or inclined installation position is forbidden (see the picture above).

If the valve is used in contaminated media, a filter with suitable mesh size must be provided upstream the valve position in order to prevent any malfunction or accident.
The installation of valves immediately downstream of a pump, upstream and downstream of elbows, Y-filters, T-pieces or butterfly valves and plunger valves is to be avoided so the required damping zones of at least 3 x DN upstream and 3 x DN downstream of the valve need to be observed. If these distances are not complied with, turbulent flow may cause disturbances in the system.





When installing a butterfly valve downstream of a control valve or a plunger valve, make sure that there is enough space between them (minimum 10 x DN).

6. Commissioning and operation.

The dimensions of the stems and actuators allow the valve to be operated by one person using the handwheel. Extensions for actuation are prohibited and may damage the valve due to excessive loads. Valves have a mechanical limit stops on the gear unit.
Forcibly turning the gear beyond that point may result in a break. The adjustment of the limit stops (OPEN, CLOSE) must not be changed without the manufacturer's consent. If valves are installed without gear units it must be ensured that the valve is not pressurized. The actuator/the gear unit may not be disassembled as long as the valve is pressurized. This also applies in case the valve is completely dismantled.
The valve itself is not equipped with position limiters.
Proper function of the valve should be checked by opening and closing it several times. For pressure tests, the pressure applied to the closed valve must not exceed its nominal pressure.
For commissioning and operation of gear box please refer to the attached proper manual.

7.Modes of operation

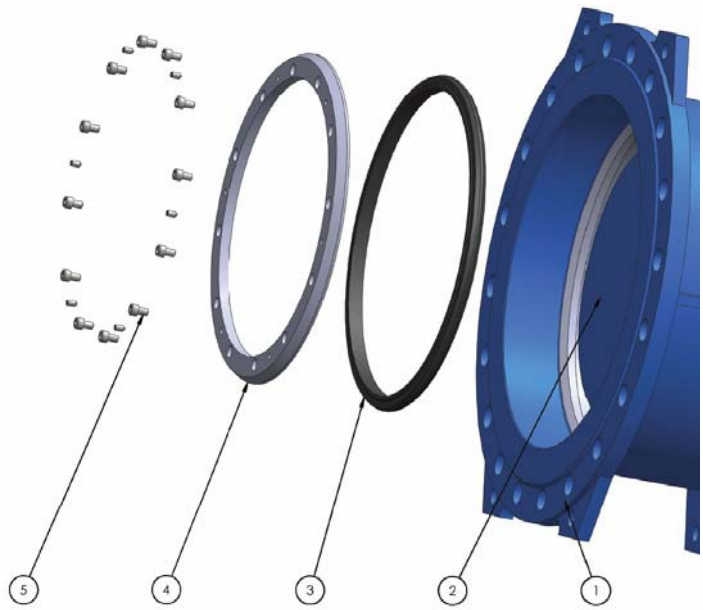
Do not exceed the maximum admissible temperature of the equipment.
Do not exceed the maximum admissible operating overpressure.
Do not load a close valve beyond the maximum admissible nominal pressure.
Do not extend the control elements (e.g. with a lever).
Do not use aggressive medium because of surface protection damages and corroding of vital parts of the valve.
In phase of maintenance/repair the valve, use only spare parts approved from La T.i.S SERVICE; any other parts without not original would void the manufacturer's warranty.
User is responsible for ensuring with appropriate safety devices to not exceed the maximum design pressure of the valve.

8. Maintenance

The valve should be checked for tightness, proper operation and corrosion protection "at least once per year"
In case of extreme operating conditions inspection should be performed more frequently.

8.1 Recommendations for the replacement of parts

Profile seals must be replaced whenever necessary.
The replacement intervals depend on the operating conditions.
When being replaced, the profile seal should always be lightly greased. Use lubricants with approval for application with foodstuffs or drinking water.



Due to the double-eccentric bearing, the profile seal can be replaced without disassembly of the disc and all safety precautions need to be taken.
Replacement of the sealing ring:
Open the disc (2) until the profile seal emerges from the body (1);
Unfasten the retaining ring screws (5);
Remove retaining ring (4) and sealing ring (3)
Clean the disc (2) in the sealing zone;
Check the seat ring in the body for damage or deposits;
Insert the new sealing ring (3) into the seat of the disc and slightly grease it;
Insert the screws (5) and fasten them little by little.

RETAINING RING SCREW TIGHTENING TORQUES				
M6	M8	M10	M12	M16
5 Nm	10 Nm	20 Nm	28 Nm	35 Nm

9. Troubleshooting

PROBLEM	CAUSES	ACTION
Valve make noise	Unfavorable installation position causing unfavorable flow around or inside the valve.	*Change installation position*
	Valve operating beyond its design limits	*Check design and/or operation data, change flow resistance in the valve, if required, by using different internals.*
Valve blocked	A foreign matter is jammed in sealing area	*Use the valve in open position so that the foreign matter is flushed away. If that doesn't help, dismantle the valve and remove foreign matter*
	Unfavorable flow and impairment of movement	*Change installation position*
	Gear blocked	*Unblock*
	No electrical connection of electric actuator	*Estabilish electrical connection*
Operational torque too high	Dirt between body seat and sealing ring	*Clean body seat and sealing ring*
	Pre pressure of sealing ring is too high	*Adjust the sealing ring*
	Gear stem is not lubricated	*Lubricate the gear stem*
High operating forces	Seat of the valve polluted by deposits	*Flush valve, dismantle, if necessary and clean seat area*
	Valve is dry in the pipeline, no medium present	*Valve can be operated more easily when wet*
Leakage losses	Pressure on sealing ring not high enough	*Adjust sealing ring*
	Sealing ring is obsolete or damaged	*Replace sealing ring*
	Remains and dirt on body sealing surfaces	*Detailed rinsing of the valve*
		If dirt is crusted, clean sealing surfaces and sealing ring
Leakage on the body seat	Valve not completely closed yet	*Close the valve*
	Valve seal damage or worn	*Replace seal*
Leakage on the shaft	Sealing on the shaft is blocked or dirty	*Replace sealing on the shaft*
Leakage on the bearing side	Damaged " O" ring in bearing cover	*Replace O-ring in bearing cover*
Cavitation in the valve	Valve operating beyond its design limits	*Butterfly valve not suitable for use as control valve. Replace the valve.*
	Operational data changed	

* For all repair and maintenance work, please observe the safety instructions 1

10. Disposal and recycling

TIS valves are designed and constructed to ensure extremely long lifetime.
At the end of their life, they have to be removed/replaced so the valve must be disassembled and each component separated and sorted according to materials, i.e. :

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

Generally applies the following:

- During disassembly phase, carefully collect greases and oils; these substances are hazardous to water and must not be released into the environment
- Arrange for controlled waste disposal or for separate recycling according to materials

! **Observe the regional regulations for waste disposal/recycling.**

11. Contacts

Spare parts can be obtained from La T.i.S SERVICE Sales departments.

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