Mounting instructions
of butterfly valves

TILIS
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TILIS

Introduction

Tilis butterfly valve is designed for food products, pharmaceutical, cosmetic and chemical fluids. Nevertheless before fitting the valve between flanges, make sure that the operating conditions are compatible with the details given on the identification plate, this instruction notice, the manufacturer’s details (technical data sheets, price list).

Socla cannot be held responsible for the malfunctioning of the valve nor for damage or injury resulting from failure to comply with these details.

European Directives

Our butterfly valves comply to directives, and statements of conformity are available from our sales department. When using accessories, (actuators, limit switches, solenoid valves, …) please see the corresponding instructions documents.

- Directive 97/23/CE (Equipment under Pressure)
  Our Tilis butterfly valves conform to the Equipment under Pressure directive 97/23/CE in category I & II

- Machinery Directive 2006/42/EC (Machinery Directive)
  Our Tilis butterfly valves conform to the Machinery Directive 2006/42/EC

Directed 94/9/CE (EXplosive ATmospheres)

Our Tilis butterfly valves are, in standard version, conform to the Directive on equipment and protection systems destined to be used in Explosive Atmospheres 97/9/CE. In certain cases, the valves (valve/actuation set) do not conform to the Directive and are therefore not sold with an CE Statement of Conformity.

In that case, the logo is not mentioned on the identification plate of the valve.

This directive is only applicable in the following atmospheric conditions:

-20°C < T +60°C and 0.8 bar ≤ P ≤ 1.2 bar

The fluid being carried is not taken into account in the risk analysis of the valve made in this directive, even if the fluid brings about deliberate internal explosive atmospheres. It is the user’s responsibility to take into account the risks generated by the fluid for example:

- the heating of the valve surface (this temperature can be higher than the one indicated on the different components of the assembly).

The temperature of the valve surface should be considered as equivalent to the temperature of the fluid which passes through the pipe (in an environment normally ventilated). Considering the temperature of the fluid which passes through the pipe, the class of temperature of the valve is:

<table>
<thead>
<tr>
<th>Class of temperature</th>
<th>Maximum temperature of surface (°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1</td>
<td>450</td>
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<tr>
<td>T2</td>
<td>300</td>
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<tr>
<td>T3</td>
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<tr>
<td>T4</td>
<td>135</td>
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<tr>
<td>T5</td>
<td>100</td>
</tr>
<tr>
<td>T6</td>
<td>85</td>
</tr>
</tbody>
</table>

- the generation of electrostatic charging due to fluid displacement,
- internal shocks generated by granular substances, shock waves present in the installation (water hammer) or risks from foreign objects which may be present in the installation.

Classification of the valve only:

II : group
2 : category
G : explosive atmospheres due to the presence of gas, vapours or mists
D : explosive atmospheres due to the presence of dust

Our products are designed to be used in atmospheres of gas and vapours of groups IIA, IIB and IIC as their coatings are a maximum 0.2 mm thick.

Our valves (valve only) are marked: II 2 DG

In cases where the coating is between 0.2 and 2 mm the marking is: II 2 DG IIB

Classification of the valve with control:

➢ Valve with hand lever:
  The use of Socla hand lever designed to function in ATEX zones does not present any extra risk.

➢ Valve with other actuators:
  The classification of the valve and control together given by Socla is identical to the classification of the lowest-classed component involved (see illustration below). The information concerning electric parts are not mentioned, as valve and hand lever are considered as a mechanical unit.

No supplementary markings are used to indicate the classification of valve/control combinations.

If a single element of the combination does not carry the ATEX mark then the entire valve/control combination does not conform to the ATEX directive.

The connecting base plate of butterfly valves conforms to the standard EN ISO 5211.

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Limit switches: II 2G EEx ia IIC T4

Pneumatic actuator: II 2 DG Tmax=95°C

Solenoid valve: II 2 DG EEx ia IIC T6

Valve: II 2 DG

In the combination opposite, the whole is classed:
II 2G EEx ia IIC T4

The classification of the equipment allows its use in a determined area; use in another area is under the responsibility of the user.

Identification plate

An identification plate with information required by the Directives is attached to the valve. This plate must not be removed and must be kept legible for the user.

- Name of the valve
- Maximum permissible pressure between flanges - Water: 20°C
- Material of the disc
- Maximum permissible pressure between flanges L1/L2
- Mini / maxi permissible temperature according to the material of the liner
- Connecting gauge
- Labelling relating to the Directive
- ATEX 94/9/CE
- Reference
- Material of the liner
- Maximum permissible pressure between flanges for gas G1/G2
- Maximum permissible pressure end of line for liquid L1/L2
- Year of manufacture
- Number of manufacturing order
- Notified Body number for the directive PED 97/23/CE
- Various approvals

Fluids Group 1: dangerous fluids (directive 67/548/CEE) / explosive / extremely inflammable / easily inflammable / inflammable / very toxic / toxic / combustive.

Fluids Group 2: all other fluids (except for water supply, distribution and evacuation networks).

Valve components

1. Shaft
2. Body
3. Circlip
4. Sealing washer
5. O-ring seal
6. Anti-extrusion bush
7. Upper anti-friction bearing
8. O-ring seal
9. Liner
10. Disc
11. O-ring seal
12. Lower anti-friction bearing
13. Spacer
14. Screw
15. Identification plate
16. Rivet
17. Annular thimble (ATEX version)
18. Anti-static earth strap (ATEX version)
19. Anti-static earth strap (ATEX version)
20. Stop washer (ATEX version)
21. Screw (ATEX version)
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Transport and storage

• Before installation
  The valve must be held in a closed position (as delivered). In the case of motorized valves with spring controls, long storage is not advised.
  The valve must not be removed from its original packaging.
  The valve must be stored inside premises which are clean, dry and free from UV light.
  On site, the valve must not be removed from its original packaging and must be protected from the surrounding elements (dust, sand, rain,….)

• During handling and installation
  The valve must not be suspended by its shaft.
  The valve must be held using adequate straps. These must not be likely to damage the casing paint.
  Any item having suffered a large impact must be returned to Socla for checking. A crack which is invisible to the naked eye may in time lead to a leak into the atmosphere.

Installation

• General remarks
  For safety reasons, the installation must take place under the supervision of authorised people taking account of local safety instructions and advice.
  The handling of butterfly valves and their controls must be done by staff trained in all technical aspects of their operation.
  Before installation the pipes must be depressurised and purged (empty of its fluid) in order to avoid any danger to the operator.
  The pipe work must be correctly aligned so that no extra stress is exerted on the valve casing.
  In ATEX zone, check that the pipes are connected to the earth. Do not use insulating pipes (PVC…)
  Check the compatibility of the connection flanges against the operating pressure: the PN number of the flanges must be greater or equal to the operating pressure.
  The valve is a machined piece of equipment and must not be used to prise apart the flanges
  The use of compensation joints, as well as flanges elastomer coated, between flange and valve are strictly forbidden.

• Fitting to the pipe work
  The Tilis butterfly valve is bi-directional.
  The recommended installation position is with the spindle of the valve horizontal and the lower wing of the disc opening from upstream to downstream (flow direction). Particularly when dealing with slimes or products with a tendency to solidify.
  Warning: Tilis butterfly valve mounted with a single acting electric or pneumatic actuator will always be delivered Normally Closed (NC). If you need it Normally Open (NO), please read the following instructions:
  - Follow the general procedure of installation with mounting the valve and its actuator in normally closed position (NC).
  - Uncouple the valve and its actuator by unscrewing the four nuts (4) and with taking out the four washers (3).
  - Pull up the actuator (1).
  - Turn the disc at 90° with an adjustable spanner through the shaft up to the open position (the saw cut shows the position of the disc). Check the saw cut is perpendicular to the valve.
  - Reassemble the actuator on the valve. It must be parallel to the pipe.
  - Screw the four nuts (4). Do not forget the washers (3).
  - Turn the position indicator (5) from 90° (the yellow strap on the position indicator, which shows the disc position, must be parallel to the pipe.

  Remarks :
  - In this configuration, the valve turns anti-clockwise.
  - Do not modify anything for solenoid valve setting.
  - In cases when using a positionner, modify the visual position indicator. Check and modify the wiring.
Mounting instructions of butterfly valves

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Installation

**Installation on existing pipe work**

1. Make sure that:
   - The flange surfaces are clean and undamaged.
   - The valve fits between the flanges without difficulty and without damaging the liner. Prise apart the flanges with suitable tools without damaging the flanges.
   - The internal diameter of the flanges conforms to the dimensions in the « flange ratings » table.
   - Nothing interferes with the movement of the disc when the valve is operating.

2. Close the butterfly so that it is about 5 to 10mm inside the casing.
   - If the disc is open too far, it may be damaged by the flanges.

3. Slip the valve between the flanges. Centre the valve casing and fit all the screws.
   - Using extra seals or grease between the valve and the flanges is prohibited.

4. Open the valve completely.

5. Keep the valve aligned with the flanges while removing the flange retractor and tightening the nuts by hand.

6. Close the valve carefully making sure that the butterfly turns freely.

7. In ATEX zone, connect the earth strap to one of the bolts of the flange. Check the link between the actuation shaft connected to the antistatic strap using an ohmmeter (test according to EN 1226-2, annex B, point b.2.2.2. and B.2.3.1). Check also that the pipes are connected to the earth.
   - For the Tiliis butterfly valve, the conductivity between the two pipes (upstream/downstream) is recommended. In Atex zone, it is compulsory.

8. Open the butterfly again completely and tighten all the bolts (opposing bolts gradually and sequentially) according to the thread torques in the table below.
   - If the nuts are tightened with the valve closed, the liner is then compressed unequally. This results in excessive torque and possible leaks.

9. Make at least 5 complete actuations of the valve.

10. See « bringing into service » paragraph.

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Prise apart the flanges as much as possible so that the valve collar slides in easily with the disc partly open.

With the disc still partly open attach the bolts without tightening the nuts.

Tighten opposing nuts sequentially, as indicated in the table.
Mounting instructions of butterfly valves

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- **Installation on new pipe work**
  1. Make sure that:
     - The flange surfaces are clean and undamaged.
     - The valve fits between the flanges without difficulty and without damaging the sleeve. Prise apart the flanges with suitable tools without damaging the flanges.
     - The internal diameter of the flanges conforms to the dimensions in the «flange ratings» table.
     - Nothing interferes with the movement of the shutter when the valve is operating.
  2. Close the disc so that it is about 5 to 10mm inside the casing.
  3. Fit the two flanges to the casing using some bolts, tighten the valve a little between the two flanges.
  4. Fix this whole assembly to the pipe work.
  5. Consolidate the flanges to the pipe work by welding at several points.
  6. Unscrew the bolts and remove the valve from between the flanges.
  7. Finish welding the flanges and allow to cool completely.
  8. Return the valve to the pipe work using the procedure "installation on existing pipe work" (from point 3.).

- **Flange ratings**
  The TILIS butterfly valve has been designed to be fitted between standard flanges. Only flanges type 11, 21 and 34 according to EN 1092-1 are completely suitable for this valve.
  For other flange models, please check the figures in the table below; we cannot guarantee these figures.

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<th>Ø A2 maxi</th>
<th>Ø B mini</th>
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<td>296</td>
<td>321</td>
<td>365</td>
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</tbody>
</table>

- **Installation conditions**
  It is recommended that the distances indicated below be respected in order to prolong the life of the valve. Mounting the valve close to pipe work junctions places it in turbulent zones and increases wear.
Mounting instructions of butterfly valves

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Commission

Before putting valve into operation, check that:

- The working conditions are compatible with the details given on the identification plate, this instruction notice and the manufacturer’s details (technical data sheet, price list catalogue, advisory service).
- The indicator on the control or the handle position (disc direction), properly indicates the position of the disc.
- All the connections have been properly made (pneumatic, electrical, hydraulic).
- The valve works effectively when tried (check several times). If necessary certain adjustments may be made to the end stops by qualified personnel.

On a new installation or after maintenance, the circuit must be rinsed with the valve completely open in order to remove solid matter which may damage the internal parts of the valve.

During a prolonged stoppage, a change in the state of the fluid may result in damage when the installation is brought back into service (solidification…). Establish an adequate procedure programme for cleaning the system.

Use

In order to guarantee the good working of the valve, we advise to carry out 1 actuation minimum per month (full opening and closing).

In ATEX zone, valve and actuation must be cleaned regularly in order to avoid any accumulation of dusts.

The hot or cold parts of valve and actuation presenting a danger for the operator must be protected.

Do not insert fingers close to parts which are moving or between the lever and the handle during its operation.

In ATEX zone, the end of line mounting is not authorized.

Maintenance

Maintenance and repair work must be carried out by qualified personnel.

During opening, closing and testing of the valve, take care not to put hands or any other object in the area of the disc.

Manipulate the liner and the disc with gloves in order to avoid damaging them by scratches.

- Removing the valve from the installation

The pipe must be depressurized and purged (emptied of its fluid) in order to avoid any danger to the operator. If the installation has carried fluids which are dangerous in themselves if in contact with the outside atmosphere (inflammable, corrosive, toxic, explosive…) it must be thoroughly cleaned to eliminate all risks.

All fluid remaining in the valve must be removed.

The temperature of the valve must be lower than 35°C to avoid all risk of burning.

If necessary, perform the operation using suitable protection (clothing, gloves, mask…).

Warning: when used in an ATEX zone, electrostatic charges may be present inside the valve (disc, liner). These electrostatic charges created by the flow of the fluid may present a risk of explosion. The user is responsible for taking all precautions to avoid this risk.

Place the disc at 10° from opening before removing the valve.

Where a control uses an external energy source, it is essential to isolate this source before any operation

- Dismantling the control from the valve.

Check the mounting position of the control before dismantling.

To reassemble, use all the original screws etc.

- Maintenance of the valve

All spare parts must be genuine Socla.

All spare parts must be used.

The use of greases and silicone is not allowed in a silicone-free environment.

Greases and silicones used must be compatible with the fluid being carried and the installation constraints.
Mounting instructions of butterfly valves

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➢ Tightness

This maintenance must be done according to the working conditions.

In an ATEX zone of category 2, this maintenance must be carried out at least every 5 years or every 500,000 operations.

- Remove the valve from the installation (see specific procedure).
- Close the disc so that it is about 5 to 10mm inside the body.
- Remove, in order, the circlip (3), the sealing washer (4), the anti-static casing tress (18) (ATEX version only), the o’ ring seal (5), the anti-extrusion bush (6). If need be, position the valve upside down to carry out this operation.
- Put the valve in open position.
- Remove the screws (14).
- Separate the two parts body (2) and remove the shaft/disc combination (1-10) liner (9) and also the 2 seals (11,8).

Valve re-assembly with replacement parts :

- Apply silicone inside and outside the liner (9) (not too much).
- Hold the body (2) of the valve in a vice.
- Put in place the shaft (1)/ the liner (9) (date at the top and material at the bottom)/ the disc (10) and the 2 o’ ring seals (11,8) and position the shaft/disc assembly in the lower half-body (2).
- Position the shaft (1) indexing the scored half-line near the top with the raised dot on one side of the disc (10).
- Fit the two spacers (13) into the sockets in the lower half-body (2).
- Position the upper half-body.
- Check that the liner (9) fits properly into the body (2).
- Fit the two screws (14), tighten them progressively until the two body halves touch (2) making several turns of the disc (10).
- Re-assemble the secondary sealing tightness in order, the anti-extrusion bush (6), the o’ring seal (5), the anti-static earth strap (18) (ATEX version only), the sealing washer (4) (the large interior diameter towards the bottom) and the circlip (3).
- Make one complete manoeuvre by turning the disc 360°.
- It is advised that the valve be re-tested by a test under pressure at 1.5 PMA (trial P11 following the standard EN12266-1).
- In ATEX zone, this test is compulsory.
- Check the link between the actuation shaft and the flange connected to the anti-static earth strap using an ohmmeter (test according to EN 12262, annex B, point B.2.2.2 et B.2.3.1). In ATEX zone, this test is compulsory.
- Fit the valve to the pipe work (See “installation” paragraph).

➢ Guide bushes

It is recommended that this maintenance be carried out every ten years or every 1,000,000 actuations (in normal conditions of use).

In ATEX zone, this maintenance is compulsory.

Follow the “Tightness” procedure. When both half-bodies are separated, remove the guide bushes (7,12) use a mallet and a screw driver.

For the valve re-assembly, put the guide bushes (7,12) in with a mallet. The smallest guide bush in the lower half-body and the biggest one in the upper half-body. Follow the “Tightness” procedure.
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Safety

As well as the indications given in the preceding paragraphs of this notice, it is imperative that the following instructions be followed:

- This notice must be available on site where Tilis valves are installed.
- Personnel carrying out any work on the valve (installation, setting, repair, maintenance) must be qualified for the task.
  - In ATEX zone, the personnel must be trained in the risks of explosion, and should have received specific ATEX training.
- In case the forwarded media would be an explosive atmosphere (deliberate internal explosive) or should it cause an explosive atmosphere in case of external leakage, the user must check the tightness of the installation after assembling, further to a faulty operation or on a periodic basis under normal conditions.
  - It is the responsibility of the user to check after the installation of the valve that there is no leakage. Especially in case of deliberate internal explosive atmospheres.
- Internal rules and legislation current in the country concerned with respect to health and safety at work must be applied and respected.
- The valve and its control must not undergo any modification without prior approval from our advisory service.
  - Socla is not responsible for any damage which may be caused by the use of parts, accessories or controls which are not genuine Socla.
- In ATEX zone, the valve and its control must be cleaned regularly to avoid the accumulation of dust.
- Hot or cold parts of the valve which present a danger to the operator must be protected.
- In ATEX zone, fitting a Tilis valve at the end of the line is not authorized.
- Do not insert fingers close to parts which are moving or between the lever and the handle during its operation.
- In ATEX zone do not re-paint the products or delivered assemblies.
- In ATEX zone, do not use conductive materials or tools (screw driver,) any closer than one centimetre distance from the external surface of the liner due to static discharge.