# INSTRUCTION MANUAL FOR LSR, TLT, TL, EQUIPPED WITH FLAMEPROOF ENCLOSURES

**FOREWORD**

These safety instructions refer to the installation, use and maintenance of instruments named LSR, TLT, TL, for use in areas featuring potentially explosive atmospheres.
The instruments covered by these instructions are equipped with the following protections against the risk of explosion:

- **II 2 G Ex d IIC T6 Gb (Tamb -40°C +60°C)**: explosion-proof enclosure
- **II 2 D Ex d tb IIIC T85°C Db IP66 (Tamb -40°C +60°C)**: explosion-proof enclosure

**N.B.:**
These instructions shall be observed in addition to the warnings provided in the User's Manual supplied by the manufacturer.

**INSTALLATION OF EXPLOSION-PROOF ENCLOSURES**

Suitability of the enclosure for the installation place.
In case of use in hazardous areas, it must be verified that the enclosure suits the area classification and the characteristics of the flammable substances that are found within the plant.
The essential safety requirements against the risk of explosion in the classified areas are set by European Directives 2014/34/EU (concerning equipment) and 1999/92/EC of 16th December 1999 (concerning systems).
**Places with presence of flammable gases, vapours, mists or dusts.**
The hazardous area classification criteria are set by the EN 60079-10 Standard.
The technical requirements for electrical systems within the classified areas are set by the EN 60079-14 Standard.
Special requirements for the construction, testing and marking of electrical equipment belonging to equipment group II.
Based on this technical and legislative provisions, the choice of the enclosure shall take into account the following factors:

- installation type: surface installation (group II )
- area classification: 0, 1, 2 (suiting equipment of category 1(Ga), 2(Gb), 3(Gc), respectively
- characteristics of flammable substances present as gases, vapours, mists or dusts
- subgroup: IIA, IIB, IIC, IIIC
- temperature class: T6 (defines gas ignition temperature)
- temperature class: T6 (defines gas ignition temperature)

The data printed on the label provide, in addition to the operational data:

- the information required to choose the appropriate type of enclosure and its correct installation.
- the references to notified bodies in charge of certification.

**Label data concerning safety**

| | |
|---|---|
| CE | Marking of conformity to directive 2014/34/UE and to the related technical standards |
| Ex | Marking of conformity to the applicable European directives |
| II 2 G | Enclosure for surface installations with presence of gases or vapours, category 2, suitable for zone 1 |
| II 2 D | Enclosure for surface installations with presence of dusts, category 2, suitable for zone 21 |
| Ex d / Ex t | Protection mode: Ex d = Explosion-proof; Ex t = Protection by enclosure |
| IIC | Enclosure of group IIC suitable for substances (gases) of group IIB or IIC |
| IIIC | Enclosure of group IIIC suitable for substances (dusts) of group IIIA, IIIB and IIIC |
| T6 | Equipment temperature class (maximum surface temperature) suitable for the corresponding temperature class of the flammable substance (gas) |
| T 85 °C | Maximum surface temperature of the enclosure |
| EPL Gb/Db | Gb/Db: “high” protection level |
| EPL Da/Db | Da: “very high” protection level<br>Db: “high” protection level |
| AB xx ATEX yyy | AB : name of the laboratory that issued the EC type-certificate<br>xx : year certificate issued<br>yyy : type-certificate number |
| xxxx | Number of notified body which notified the quality of the production system |

Remarks: a) Enclosures of group IIC are also suitable for environments IIA and IIB.

b) Enclosures of group IIIC are also suitable for environments IIIA and IIIB
c) Explosion-proof enclosures are designed to operate with room temperature within the range:
-40 ÷ +60°C for temperature class T6 (gas) T85°C (dusts)
d) Enclosures for temperature service T6 are also suitable for classes T1 to T5.

## 1. DESCRIPTION

The instruments named LSR, TLT, TL, are designed in accordance with the standards EN60079-0 (2012), EN60079-1 (2007), EN60079-11 (2012), EN60079-26 (2007), EN60079-31 (2009).
They can be equipped as follows:
a) With one or more SPDT or SPST (LSR) reed micro-switches.
b) With an electronic transmitter(TLT,TL).

## 2. LABEL PLATE IDENTIFICATION

A label plate is applied to each instrument as shown in the figure.


The label plate bears the following information:
(1) Model
(2) serial number
(3) year of manufacture
(4) Room temperature -40 ÷ +60°C
(5) Max current (A)
(6) Max voltage (VAC or VDC)

## 3. PUTTING INTO SERVICE

3.1 Ensure the limits set for use of the instrument are not exceeded and that the electrical rating applied matches the nameplate data.
3.2 The user shall verify compatibility of use with the data provided in the supplementary label plate (e.g.: Pressure, Temperature).
More in detail, the surface temperature shall be less than 80% the ignition temperature of the hazardous gas.

## 4. INSTALLATION

4.1 CABLE ENTRIES
Connections shall be made by cable or conductor entries in conduit in accordance with the EN 60079-14 Standard. Cable entries shall be made in such a way that the specific properties of the protection mode are not altered, as laid down in the EN 60079-1 Standard as regards enclosures Ex d; and the EN 60079-31 standards as regards Ex tb enclosures.
When the cable entry is made using a cable gland, the latter shall be properly chosen as a function of the type of installation and cable. The cable gland shall be tightened to ensure the seals achieve the pressure required:
a) to prevent the transmission of mechanical stress to the terminals
b) to ensure the mechanical protection (IP level) of the terminal box.Cable entries must be made with Ex d and Ex t sealing fittings or cable glands certified as in compliance with the EN 60079-0, EN 60079-1 and EN 60079-31 ATEX Standards (directive 2014/34/UE) and with a minimum IP 66 protection level.
**Nota Bene:** No gaskets should be added unless they are supplied by the manufacturer;

4.2 GROUNDING

In addition to the ground connection provided inside the enclosure, there is also a further earth electrode located outside.
It shall be connected to the general grounding of the system using a suitable conductor.

Depending on the section **S** of the line conductor, the section of the ground conductor shall be:

| | |
|---|---|
| = S | for S $\leq$ 16 mm$^2$ |
| 16 | for 16 mm$^2$ < S $\leq$ 35 mm$^2$ |
| $\geq$ 0,5 S | for S > 35 mm$^2$ |

4.3 WIRING

The instrument named LSR (Fig. 1) is equipped with a terminal box located inside the enclosure, the amount of terminals is a function of the number of reed contacts, models TLT and TL (Fig. 2) have the electrical connection directly on transmitter 4-20 mA

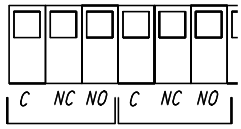



Fig. 1

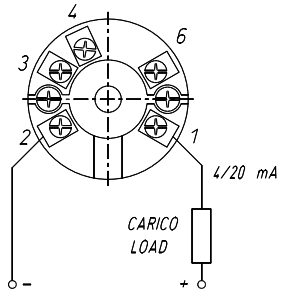



Fig. 2

4.4 CLOSING COVER

In order to ensure the IP66 level of watertightness and dust seal, the screw cover shall be tightened thoroughly and then locked with the special grab screw.

4.5 INSPECTION AND MAINTENANCE OF EXPLOSION-PROOF ENCLOSURES

Inspection and maintenance activities of explosion-proof enclosures shall be carried out in compliance with the EN 60079-17 Standard.

- The terminals of the electrical connections shall be tightly clamped to avoid high contact resistances resulting in overheating.
- The threaded cover shall be closed as described above and locked against all loosening by the special grab screw.
- The replacement of gaskets and parts of cable entries shall be carried out using parts that are identical to those supplied by the manufacturer in order to ensure maintenance of the protection.

The surfaces of the explosion-proof joints (e.g.: cover body joint) shall not be machined, nor seals shall be applied that have not been supplied by the manufactured. These surfaces must always be kept clean. Against corrosion and to ensure easy loosening in the event of maintenance a thin layer of non-hardening grease (such as silicone grease) can be used. This grease must be restored any time the above surfaces are dismantled.

## 5 MAINTENANCE

5.1 WARNINGS

**Before opening the enclosure, make sure there is no explosive atmosphere all around.**
"**DISCONNECT SUPPLY BEFORE OPENING**"
-NEVER open the cover without being sure that the supply voltage has been cut off;
-NEVER leave the enclosure without the cover for longer than the inspection time;
- NEVER use the instrument with an electrical rating that exceeds the values specified on the rating plate label;
- NEVER perform settings or replace parts without having carefully read the instructions beforehand; in case of doubts, please consults our customer service department;
- NEVER lubricate any parts of the instrument;

5.2 PERIODICAL INSPECTION OF CONTACTS

Cut off the voltage supply.
With the cover open, perform a visual inspection to ensure that the tripping unit has no damaged or worn parts.

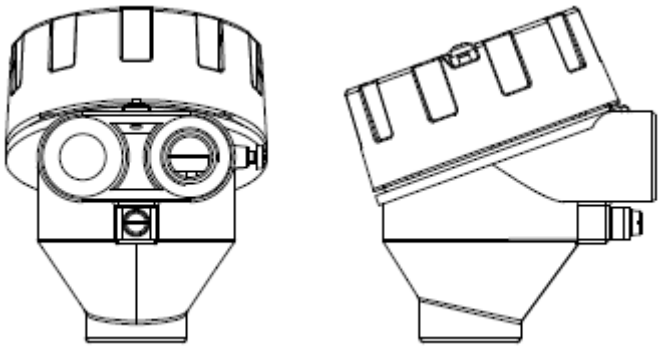
5.3 ASSEMBLY INSTRUCTIONS

- Unlock the screw fixed on the cap and unscrew the latter to open the enclosure.
- Perform the inspection as detailed above.
- Remember to retighten the screw after closing the cap, making sure to comply with the above instructions.

5.4 REPAIRS OF EXPLOSION-PROOF ENCLOSURE

All repairs of explosion-proof enclosures shall be carried out in accordance with the provisions set forth in the IEC 79-19 Standard.
**In cases when the repairs are not carried out by Officine Orobiche, they shall only be carried out by facilities that avail of the equipment required to perform the repairs and provided that they are previously approved by Officine Orobiche.**
All replacement parts shall be original parts supplied by Officine Orobiche. Repairs of broken parts are not allowed.

## 6. DIMENSIONAL DRAWINGS OF THE BODY



## 7. DISPOSAL

When the instruments reach the end of their service life, they need to undergo disposal. Always comply with the applicable regulations in force.
All metal parts, after the removal of seals and gaskets, special protective coatings requested by the customer and all other plastic parts, can be recycled.

## 8. GUARANTEE

All of the parts making up the enclosures are warranted to be free from manufacturing defects for 12 months from the date of dispatch.
In the event of failures, implying return of goods within the limit specified above, OFFICINE OROBICHE will replace (shipment fees not included) all damaged parts free, provided that the failure does not ensue from incorrect use.
OFFICINE OROBICHE shall never be held responsible for any incorrect use of their products when these are used for purposes other than those mentioned in the specifications approved at the order stage.
In these cases, no complaints will ever be taken into consideration.
No damage and/or fee, whether direct or indirect, ensuing from an incorrect installation or use shall ever be debited to OFFICINE OROBICHE.

| *DOCUMENT INCLUDED IN THE EC-TYPE EXAMINATION CERTIFICATE*<br>*No change is allowed without the NOTIFIED BODY's statement.* | | |
|---|---|---|
| *ATEX manager's approval* | *Date:* | *Signed:* |
| *Issued on* | *Date:* | *Signed:* |
| *Implemented on* | *Date:* | *Signed:* |