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BALANCING MACHINES

SAFETY INSTRUCTIONS

VIBRATION TRANSMITTER - MODEL TR-I

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Contents : 6 pages

Introduction

The safety measures and equipment used in the place of installation, operation and maintenance must follow the specific instructions contained in this manual and the applicable installation regulations (basic regulations of the place of installation) and the additional regulations for places with an explosive gas atmosphere in accordance with EN 60079-14 and EN 60079-17 as regards installation and testing as well as IEC 60079-19 as regards maintenance and repair (unless otherwise specified).

These safety instructions refer to installation, use and maintenance of the TR-I device. The devices have been designed and constructed according to the requirements of the European standards EN 60079-0, EN 60079-1 and EN 60079-31 as well as in compliance with ATEX Directive 94/9/EC.

These instructions are intended for appropriately trained and informed installers and users that already have basic technical experience in installation and use of electrical systems and machinery in places where there is a risk of explosion.

Reference documentation

These instructions are accompanied by a dimensional drawing and the technical data necessary to properly carry out installation and connection. Therefore, refer to them for the relative instructions.

Limits of use

The device described in these instructions is characterised by the following protection level:

**II 2 GD Ex d IIC T6 Gb
Ex tb IIIC T85°C Db**

These safety instructions as well as the warnings indicated in the user manual provided to the customer must be observed.

The installer and user are always responsible for ensuring that the characteristics of the places of installation are in accordance with the above mentioned limits and specifications.

Product specifications

The TR-I transmitter measures absolute vibration of any rotating machine support and is capable of directly interfacing with an acquisition system (PLC or DCS) in 2-wire technique (4-20 mA current loop).

Typical applications

The need to keep an ever increasing number of machines under control at acceptable costs, especially in large plants, requires installation of compact and simple systems interfaced with the central acquisition system.

This type of transmitter generates a current signal (4-20 mA) proportional to the vibration speed or acceleration, respectively.

Electrical characteristics

Nominal voltage	24V
Nominal current	4 - 20 mA

Ambient conditions

Ambient temperature	-40° ÷ +70° C
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Device suitability for the place of installation



If used in areas where there is a risk of explosion, it must be verified that the type of device identified is suitable for the area classification and for the flammable substances in the plant. The essential safety requirements against the risk of explosion in the classified areas are laid down by the European Directives 94/9/EC of 23 March 1994 (as regards equipment) and 1999/92/EC of 16 December 1999 (as regards systems).

The criteria for classification of areas with a risk of explosion are specified in IEC 60079-10.

The technical requirements for electric systems in the classified areas are specified in IEC 60079-14.

As well as the functional data, also the references to the notified certification bodies are indicated on the data plate.

Legend of safety-related data indicated on the identification data plate

II 2 GD	II 2 GD equipment of category 2 in Ex atmosphere for gas and powder suitable for zone 1 and 21
Ex d	Gas explosion proof equipment
II C	Group IIC equipment suitable for Group IIC or IIB or IIA substances (gas)
T6	Transmitter temperature class (maximum surface temperature) suitable for the corresponding temperature class of the flammable substance.
Gb	“High” protection level
Ex tb	Equipment for combustible powders with protection by means of sealed case
IIIC	Equipment for conductive and non-conductive combustible powders
T85°C	Surface temperature
	Marking of conformity with the applicable European directives
	Marking of conformity with Directive 94/9/EC and the relative technical standards
CESI 03 ATEX 016	Name of the laboratory that issued the EC type certificate; 03 = year of certificate issuance; 016 = certificate number
0722	Number of the Notified Body (CESI) that oversees the production system
Tamb	Ambient operating temperature

Notes:

- Group IIC equipment is also suitable for group IIB and IIA atmospheres

ATEX marking



Electrical connections

The connections must be made by means of cable or conductor inlets in a conduit in compliance with EN 60079-14.

The cable inlet must be made in such a way as not to alter the specific protection properties as indicated in EN 60079-1 (par. 13.1 and 13.2) for **Ex d** cases (explosion proof protection) and must guarantee at least IP65 protection.

When the cable inlet is made by means of a gland, it must be chosen correctly in relation to the system type and cable type. The gland must be fully tightened so that the sealing rings exercise the necessary pressure indicated in the CE type certificate of the gland.

The cable inlets must be made with **Ex d** locking fittings or glands certified according to the ATEX standards (Directive 94/9/EC) as mentioned above and must guarantee at least IP65 protection.

Ground connection

The transmitter is equipped with a ground terminal located in the case.

It must be connected to the main ground of the system with a conductor of adequate cross-section.

In relation to the cross-section S of the line conductor, the ground conductor cross-section must be:



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= S	per $S \leq 16 \text{ mm}^2$
16	per $16 \text{ mm}^2 < S \leq 35 \text{ mm}^2$
$\geq 0,5 S$	per $S > 16 \text{ mm}^2$

Testing and maintenance

Testing and maintenance of the explosion proof transmitters must be carried out according to the criteria specified in IEC 60079-17.

The threaded cover must be fully tightened.

The seals and parts of the cable inlets must be replaced with components indicated in the documents attached to the CE type certificate of the gland.

The surfaces of the explosion proof joints (e.g. cover body joint) may not be worked nor may seals not provided by the manufacturer be introduced.

These surfaces must be kept clean.

Repair

In the event of malfunctioning or damage, the device must be sent to CEMB S.p.A. for repair.