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SAFETY INSTRUCTIONS

VIBRATION TRANSMITTER - MODEL TR-NC/8 IECEx

Document No. I131PRD of 19/01/15 rev. 01

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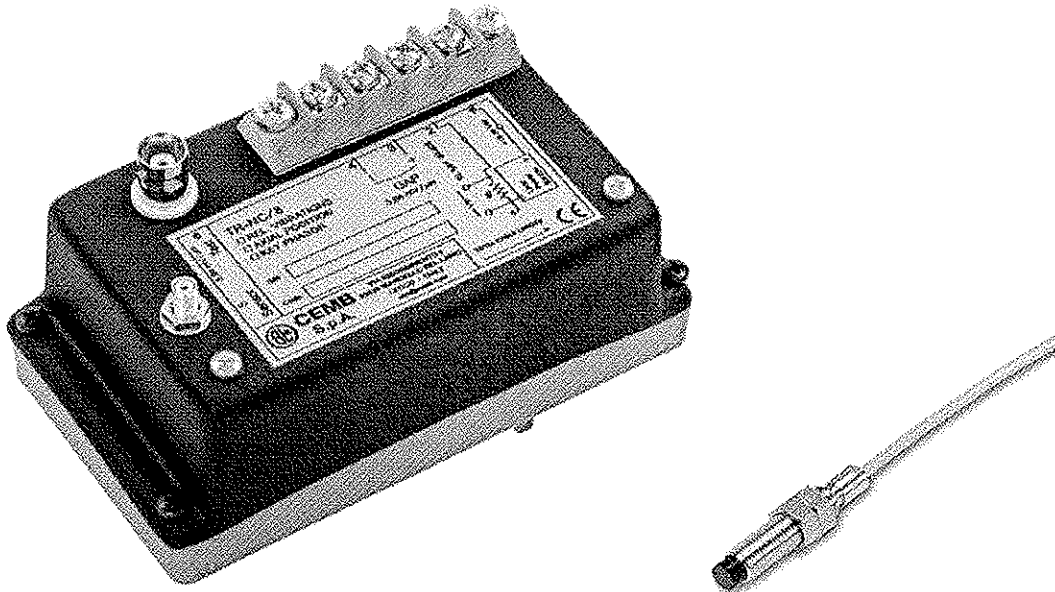
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1. Product specifications



The TR-NC/8, together with ST-NC/8 sensor and CPT-NC/8 cable, transmitter measures the relative vibrations or axial displacement of a shaft with respect to a support, or its rotation speed, and is able to interface directly in 2-wire technique (4-20 mA current loop) with an acquisition system (PLC or DCS).

Electrical characteristics

Nominal voltage	24 V
Nominal current	4-20 mA loop

Ambient conditions

Converter temperature	-20 ÷ +70 °C
Cable/Sensor temperature	-55 ÷ +175 °C
Converter relative humidity	95% non condensing
Cable/Sensor relative humidity	100%
Sensor degree of protection	IP67

2. Limits of use – IECEx marking

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 IEC 60079-14 and IEC 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-NC/8 transmitter, ST-NC/8 sensor and CPT-NC/8 cable. The devices have been designed and constructed according to the requirements of the European standards IEC 60079-0, IEC 60079-11.

These instructions are intended for suitably 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.

IECEx marking

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

IECEx Ex ia IIC T6 / T5 Ga
Ta = -20°C - +60 / +70°C

Sensor ST-NC/8 and cable CPT/NC/8 can work in T6 / T5 / T4 / T3 for Ta= -55°C - +60/+80/+110/+175°C.

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

If the TR-NC/8 device is installed in Zone 0, it needs to be enclosed in a stainless steel container or in any case according to the regulations for use in Zone 0 in order to prevent possible charge accumulation.

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.

Drawing no. 04PTB6212 shows the identification data plate.

Drawing nos. 04PT002870 and 04PT002871 show the warning labels.

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

Ex ia	Class "ia" equipment
IIC	Group IIC equipment suitable for Group IIC substances (gas)
T6-T5	Temperature class T6 (85°C); T5 (100°C)
CES _ _ . _ _ _ X	Name of the laboratory that issued the certificate and the certificate number
Tamb	Ambient temperature: -20 to +60°C T6 -20 to +70°C T5
Ga	EPL (equipment protection level)

Notes:

- Group IIC equipment is also suitable for group IIB and IIA.
- The intrinsic safety device to be interfaced must be chosen based on the output parameters of the associated device.

3. 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 flammable substances in the system. 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.

The measurement chain, composed of transmitter, sensor and cable, must be installed in zone 0 or 1 and interfaced with suitable barriers compatible with the power supply (terminals 1 - 2).

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

4. Installation

Fitting

The TR-NC/8 transmitter must be connected to a sensor type ST-NC/8 by means of a dedicated extension cable CPT-NC/8.

For details on mechanical installation and sensor positioning, refer to the instruction manual.

The TR-NC/8, shall be mounted within a suitable enclosure, to prevent ingress of moisture or dust or by access to conducting parts and in order to protect against unauthorized interference and damage, the components and internal wiring of the equipment.

When the equipment is installed in Zone 0, shall be placed inside a stainless steel housing

Electrical connection and coordination

The electrical connection must be carried out by appropriately trained persons following the indications in the drawing no. 87SEB6080.

The electrical connections regard:

- Bipolar shielded power/signal cable (TERMINALS 1-2).
- Connection to CEMB sensor model ST-NC/8 API (TERMINAL 5) directly or using CEMB cable model CPT-NC/8
- Any instruments with level of protection Ga, for GAP measurement and signal analysis (TERMINALS 3-4 and 6)

The device input/output parameters are defined in the table below and indicated in the marking.

	TERMINALS	PARAMETERS	
Power supply	1 - 2	Ui = 28 V	
		Li = 100 mA	
		Pi = 650 mW	
		Ci = Negligible	
		Li = Negligible	
GAP measurement and Analyser connection <i>(connect only instruments with level of protection Ga)</i>	3 - 4	Uo = 28V	
		Io = 100 mA	
		Po = 650 mW	
		Ci = 50 nF	
	6	Li = 200 uH	
		Co = 10 nF	
		Lo = 90 uH	
		Lo/Ro = 50 uH/Ω	
Sensor connection	5	CEMB sensor model ST-NC/8 Cable model CPT-NC/8	<i>General parameters</i>
			Uo = 28 V
			Io = 100 mA
			Po = 650 W
			Ci = 50 nF
			Li = 110uH
			Co = 10nF
			Lo = 90uH
			Lo/Ro = 50uH/Ω

CEMB sensor model ST-NC/8 parameter are:

Ui=28V – Ii=100mA – Pi=700mW – Ci=80pF/m - Li=80uH**

CEMB cable model CPT-NC/8 parameter are:

Ui=28V – Ii=100mA – Pi=700mW – Ci=80pF/m - Li=negligible**

**Cable total length max. 12m

WARNING:

- The cable must not be shortened or lengthened as it would result in a measurement error.
- The GAP reading in volt on terminals 3-4 (see the user manual) should be done using only with level of protection Ga.
- The device is equipped with a BNC outlet (terminal 6) usable to perform diagnosis of the machinery by means of an analyser which must be with level of protection Ga.
- The intrinsic safety circuits must be powered by associated devices that comply with the above mentioned electrical specifications.

Experts must assess whether the system composed of the associated device, the intrinsic safety device and the connection cables is in accordance with the IEC 60097-14 requirements.

5. Testing and maintenance

Device testing and maintenance must be carried out according to the criteria specified in IEC 60079-17.


6. Repair

In the event of malfunctioning or damage, it is advisable to send the device to CEMB S.p.A. for repair.

If repairs are not carried out by the manufacturer, they must be carried out according to the criteria specified in IEC 60079-19 at workshops equipped with the necessary tools for repair and subsequent testing, and who have adequate technical knowledge also relating to the protection levels.

0	1	2	3	4	5	6	7	8	9
					Rev.	Creazione	Descrizione Modifica		Disegnatore

TR-NC/8


CEMB
 S.p.A.
 Via Rinaldo Ossola 3
 20028 MARCONI (MI)
 ITALY

Ex In IEC 10/15 Cs Ta = 20 + ± 60 / ± 70 °C
 IECEx CES_...

Term	1-2	UF=28V	IF=100mA	PF=60mW	CI=0mF	LI=0 μ H
Maxima Term	3,4	UF=28V	IF=100mA	PF=60mW	LI=90 μ H	LWR=50 μ H/D
Term	6	CF=50mF	LI=20 μ H	CP=10mF		
Term	5	UF=28V	IF=100mA	PF=60mW	LI=90 μ H	LWR=50 μ H/D
Term		CF=50mF	LI=10 μ H	CP=10mF		

Sensor ST-NC/8-Cable CPT-NC/8

90

20

NOTE	TOLLERANZE ISO 2768-H					
PAGGI NON QUOTATI: T MAX	DA	0,5	7	31	121	401
SPUNSI NON QUOTATI: 0,5x ± 5 °	A	6	30	120	400	2000
TOLLERANZE ANGOLARI: ± 30 TOLL. $\pm 0,025$ $\pm 0,1$					$\pm 0,15$	$\pm 0,2$

Data: 23/02/2016

Disegnatore: Andreatti D.

Cliente:

Ordine:



SCALE: 2:1

FOGLIO 1 di 1

FORMATO A4

Tipo di macchina:

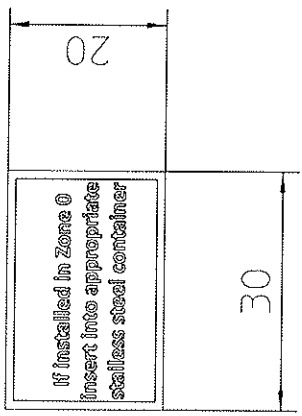
Disegno:

Descrizione: IECEx marking T-NC/8 - API

Cod: 04PTB6212

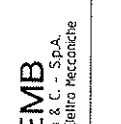
Rev. A

0	1	2	3	4	5	6	7	8	9
					Rev.	Creazione	Descrizione	Modifica	Disegnatore



Re 32/	NOTE	TOLLERANZE ISO 2768-FH					
	RAGGI NON QUOTATI: 1 MAX	DA	0.5	7	31	121	401
	SMUSI NON QUOTATI: 0.5x45° A	6	30	120	400	2000	
	TOLLERANZE ANGOLI: ± 30'	TOLL.	+0.05	+0.1	+0.15	+0.2	+0.5

Data: 20/01/2016
 Disegnatore: Addicofit D.
 Cliente:
 Ordine:



SCALE: 1:1
 FOGLIO: 1 di 1
 FORMATO: A4

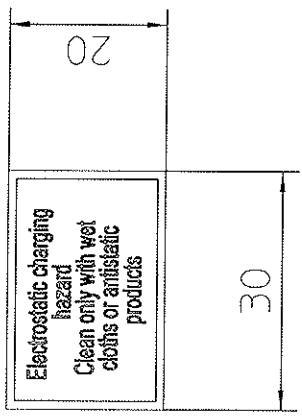
tipo di macchina:
 Disegno:
 Descrizione: IECEX zero zone marking

Cod: 04PT002870

Rev. A

WARNING: DO NOT CHANGE WITHOUT PERMISSION ENTITY NOTIFIED

0	1	2	3	4	5	6	7	8	9
					Rev.	Creazione		Descrizione Modifica	Disegnatore



	NOTE	TOLLERANZE ISO 2768-FH																	
	RAGGI NON QUOTATI: 1 MAX SWISSI NON QUOTATI: 0.5x45° A TOLLERANZE ANGOLI: 30° TOLL.	<table border="1"> <tr> <td>DA</td> <td>0.5</td> <td>7</td> <td>31</td> <td>121</td> <td>401</td> </tr> <tr> <td></td> <td>6</td> <td>30</td> <td>120</td> <td>400</td> <td>2000</td> </tr> <tr> <td>TOLL.</td> <td>+0.05</td> <td>+0.1</td> <td>+0.15</td> <td>+0.2</td> <td>+0.5</td> </tr> </table>	DA	0.5	7	31	121	401		6	30	120	400	2000	TOLL.	+0.05	+0.1	+0.15	+0.2
DA	0.5	7	31	121	401														
	6	30	120	400	2000														
TOLL.	+0.05	+0.1	+0.15	+0.2	+0.5														

Data: 20/01/2016
 Disegnatore: Andreotti D.
 Cliente:
 Ordine:

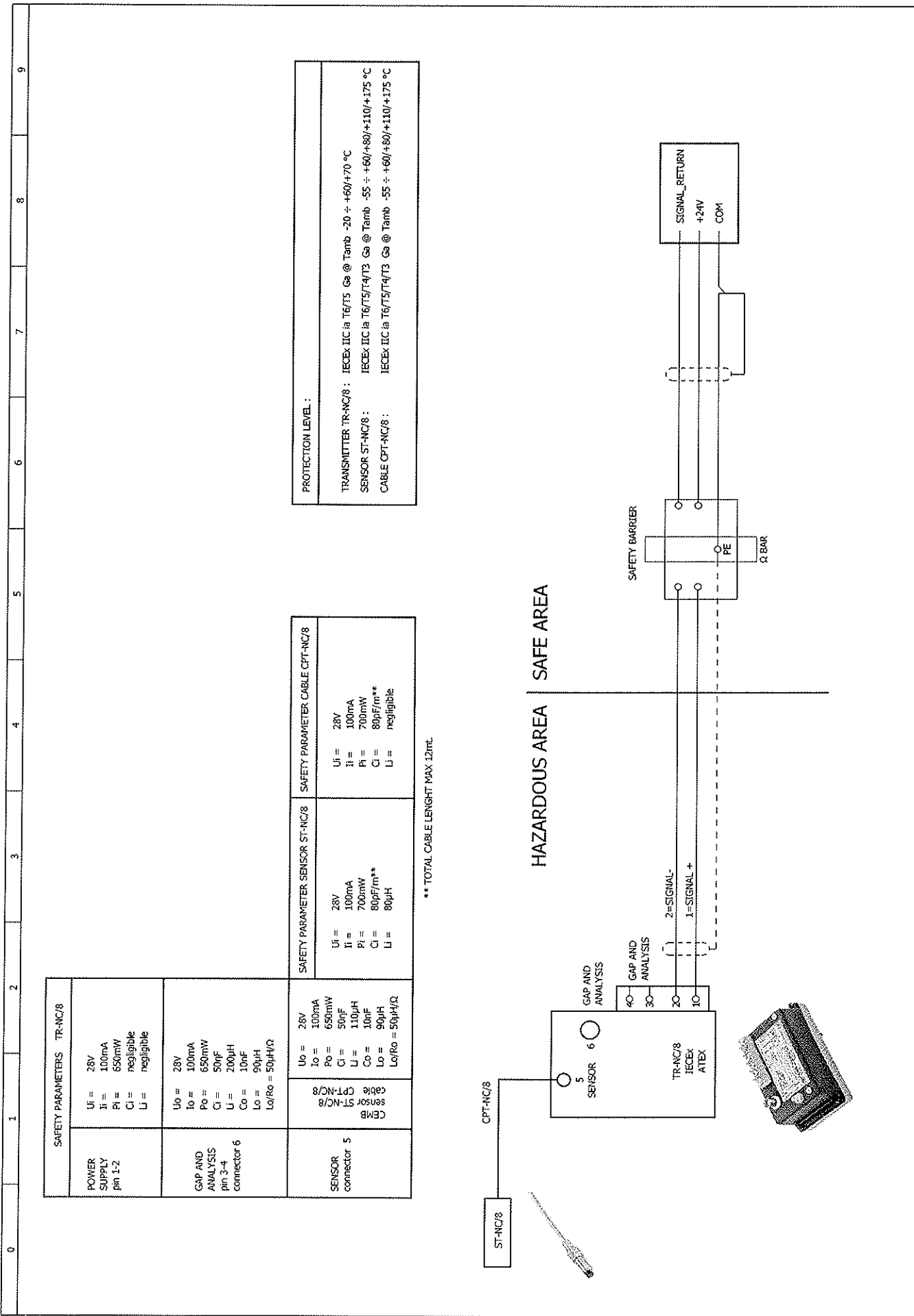


SCALE	1:1
FOGLIO	1 di 1
FORMATO	A4

Tipo di macchina:
 Disegno:
 Descrizione: IECEX clean marking

Cod: 04PT002871
 Rev. A

WARNING: DO NOT CHANGE WITHOUT PERMISSION ENTITY NOTIFIED



SAFETY PARAMETERS TR-NC/8	
POWER SUPPLY pin 1-2	U _i = 28V I _i = 100mA P _i = 650mW C _i = negligible L _i = negligible
GAP AND ANALYSIS pin 3-4 connector 6	U _o = 28V I _o = 100mA P _o = 650mW C _o = 50nF L _o = 200µH C _o = 10nF L _o = 90µH Lo/Ro = 50µH/Ω
SENSOR connector 5	U _o = 28V I _o = 100mA P _o = 650mW C _o = 50nF L _o = 110µH C _o = 10nF L _o = 90µH Lo/Ro = 50µH/Ω

SAFETY PARAMETER SENSOR ST-NC/8		SAFETY PARAMETER CABLE CPT-NC/8	
U _i = 28V	U _i = 28V	U _i = 28V	U _i = 28V
I _i = 100mA	I _i = 100mA	I _i = 100mA	I _i = 100mA
P _i = 700mW	P _i = 700mW	P _i = 700mW	P _i = 700mW
C _i = 80pF/m**	C _i = 80pF/m**	C _i = 80pF/m**	C _i = 80pF/m**
L _i = 80µH	L _i = 80µH	L _i = negligible	L _i = negligible

** TOTAL CABLE LENGTH MAX 12mt

PROTECTION LEVEL :	
TRANSMITTER TR-NC/8 :	IECEX IIC ia T6/T5 Ga @ Tamb -20 ÷ +60/+70 °C
SENSOR ST-NC/8 :	IECEX IIC ia T6/T5/T4/T3 Ga @ Tamb -55 ÷ +60/+80/+110/+175 °C
CABLE CPT-NC/8 :	IECEX IIC ia T6/T5/T4/T3 Ga @ Tamb -55 ÷ +60/+80/+110/+175 °C

Date	14/11/2014	Customer :	CEMB S.p.A.
Comm.	en_cab	Order :	
Print	16/02/2016	Origin :	
Modif.		Subst. for	
Date	None		
Sheet	1	Part code	87SE6080
Sheet	1		
Sheet	1		

Sheet name : INSTALLATION TRANSMITTER TR-NC/8 IECEX IIC ia T6/T5 Ga @ Tamb -20 ÷ +60/+70 °C
 Drawing nr. : 87SE6080
 Type : VIBRATION TRANSMITTER
 PATH EPLAN
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