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**CEMB**  
BALANCING MACHINES

## SAFETY INSTRUCTIONS

### VIBRATIONS TRANSDUCER - MODEL T-NC/8-API

Document No. I56PRD of 12/03/19 rev. 03

**CESI**



protocollo	firma
<b>B9007082</b>	<i>[Signature]</i>
allegato al certificato	data
<b>CESI 03 ATEX 094 X</b>	<b>09/04/2019</b>

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## 1. Product specifications



The T-NC/8-API converter, together with ST-NC/8 sensor and CPT-NC/8 cable, measures the relative vibrations or axial displacement of a shaft with respect to a support. The output is a negative voltage value proportional to the target distance.

### ***Electrical characteristics***

Nominal voltage	-24 V
Nominal current	10mA

### ***Ambient conditions***

Converter temperature	-30 + +80°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 – ATEX 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 EN 60079-14 and EN 60079-17 as regards installation and testing as well as EN 60079-19 as regards maintenance and repair (unless otherwise specified).

These safety instructions refer to installation, use and maintenance of the T-NC/8-API converter, ST-NC/8 sensor and CPT-NC/8 cable. The devices have been designed and constructed according to EN 60079-0, EN 60079-11 and rules and according to 2014/34/UE directive (ATEX).

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.

### ATEX marking of T-NC/8-API

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

**II 1G Ex ia IIC T6 / T5 Ga**  
**Ta = -30°C - +60 / +80°C**

Sensor ST-NC/8 and cable CPT-NC/8 have operating temperature from -55°C up to +175°C.  
The temperature classification depends of the machine temperature on which the product is fitted :  
T6 up to +60°C; T5 up to +80°C; T4 up to +110°C; T3 up to +175°C



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

If the T-NC/8-API 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. 04PT029296 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**

<b>II</b>	Environments other than mines
<b>1G</b>	Zone 0 for GAS
<b>Ex ia</b>	Class "ia" equipment
<b>II C</b>	Group IIC equipment suitable for Group IIC substances (gas)
<b>T6-T5</b>	Temperature class T6 (85°C); T5 (100°C)
	Mark of conformity to European directives applicable
	Marking of conformity according to directive 2014/34/UE and the relevant technical regulations
<b>CESI 03 ATEX 094</b>	Laboratory name that issued the CE type certificate; 03 = year of first issue of the certificate; 094 = number of the certificate.
<b>0722</b>	Number of the Notified Body (CESI) that performs surveillance of the production system
<b>CESI</b>	Name of the laboratory that issued the certificate and the certificate number
<b>Tamb</b>	Ambient temperature: -30 to +60°C T6 -30 to +80°C T5
<b>Ga</b>	EPL (equipment protection level)

Notes:

- a) Group IIC equipment is also suitable for group IIB and IIA.
- b) 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 2014/34/UE of 26 February 2014 (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 EN 60079-10. The technical requirements for electric systems in the classified areas are specified in EN 60079-14.

The measurement chain, composed of converter, sensor and cable, must be installed in zone 0 or 1 and interfaced with suitable barriers compatible with the power supply (terminals 1 - 2) and signal output (terminals 2 - 3).

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

### **4. Installation**

#### ***Fitting***

The T-NC/8-API converter must be connected to a sensor type CT-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 T-NC/8-API, 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. 87SE002022.

The electrical connections regard:

- Tripolar shielded power/signal cable (TERMINALS 1-2-3).
- Connection to CEMB sensor model ST-NC/8 API (TERMINAL 4) directly or using CEMB cable model CPT-NC/8

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

	TERMINALS	PARAMETERS	
Power supply  Output	1 – 2	Max terminals 1-2-3	
		U <sub>i</sub> = 28 V	U <sub>i</sub> = 26.6 V
	2 – 3	l <sub>i</sub> = 120 mA	l <sub>i</sub> = 135 mA
		P <sub>i</sub> = 840 mW	P <sub>i</sub> = 900 mW
		C <sub>i</sub> = 30nF	
		L <sub>i</sub> = 200uH	
Sensor connection (miniature threaded coaxial connector)	4	<b>CEMB            sensor model            ST-NC/8            Cable model            CPT-NC/8</b>	<i>General parameters</i>
			U <sub>o</sub> = 28 V
			l <sub>o</sub> = 120 mA
			P <sub>o</sub> = 840 W
			C <sub>o</sub> = 2nF
			L <sub>o</sub> = 90uH
			L <sub>o</sub> /R <sub>o</sub> = 40uH/Ω

**CEMB sensor model ST-NC/8 parameter are:**

**U<sub>i</sub>=28V – l<sub>i</sub>=120mA – P<sub>i</sub>=840mW – C<sub>i</sub>=1nF\* - L<sub>i</sub>=80uH**

**CEMB cable model CPT-NC/8 parameter are:**

**U<sub>i</sub>=28V – l<sub>i</sub>=120mA – P<sub>i</sub>=840mW – C<sub>i</sub>=1nF\* - L<sub>i</sub>=negligible**

\*Cable total length max. 12m

**WARNING:**

- **The cable must not be shortened or lengthened as it would result in a measurement error.**
- **The intrinsic safety circuits must be powered by associated devices that comply with the above mentioned electrical specifications.**
- **Do not mount or connect with very low ambient temperature (recommended temperature not below -5°C)**

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

## **5. Testing and maintenance**

Device testing and maintenance must be carried out according to the criteria specified in EN 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 EN 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

85

 <b>CEMB</b> S.p.A Via Risorgimento 9 23826 MANDELLO DEL LARIO LECCO- ITALY CE 0722 Ex II 1 G Ex ia IIC T6/T5 Ga CESI 03 ATEX 094 Ta=-30 ÷ +60/80°C	T-NC/8-API Sensor term 4 Uo=28V Io=120mA Po=0.84W Co=2nF Lo=90uH La/Ro=40uH/ohm
Supply 1-2 Signal 2-3  Max terminals 1-2-3 Uj=28V or Uj=26.6V Ii=120mA Ii=135mA Pi=0.84W Pi=0.90W Ci=30nF Li=200uH	16

 Ra 3.2/ Tolleranze angolari: ± 30'   TOLL. ± 0.15 ± 0.2 ± 0.5	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 ANGOLARI: ± 30'   TOLL. ± 0.15 ± 0.2 ± 0.5	

Data: 19/02/2019  
 Disegnatore: Alippi A.  
 Cliente:  
 Ordine:

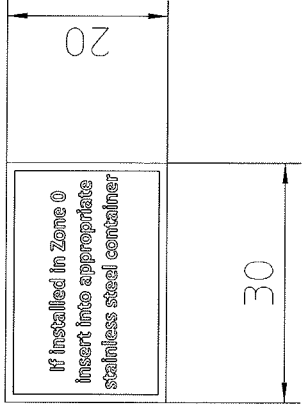
  
**CEMB**  
 Ing. Buzzzi & C. S.p.A.  
 Costruzioni Elettro Meccaniche

SCALE	2:1	Tipo di macchina:
FOGLIO	1 d 1	Disegno:
FORMATO	A4	Descrizione:

Cod: 04PT029296  
 Rev. A



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	DA	0.5	7	31	121	401	
	SPUNSI NON QUOTATI: 0.5x45°	A	6	30	120	400	2000	
		TOLLERANZE ANGOLARI: ± 30'	TOLL.	+0.05	+0.1	+0.15	+0.2	+0.5

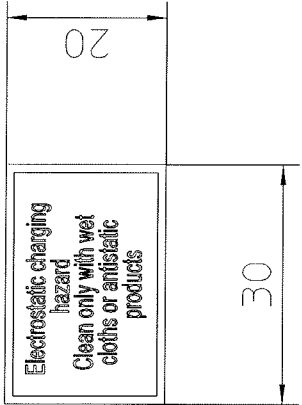
Data: 20/01/2016  
 Disegnatore: Andreotti D.  
 Cliente:  
 Ordine:



WARNING: DO NOT CHANGE WITHOUT PERMISSION ENTITY NOTIFIED

SCALE	1:1	Tipo di macchina:	
FOGLIO	1 di 1	Disegno:	
FORMATO	A4	Descrizione:	IECEX zero zone marking
			Cod: 04PT002870
			Rev. A

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



	TOLLERANZE ISO 2768-fH									
	RAGGI NON QUOTATI: 1 MAX	DA	0.5	7	31	121	401			
	SMUSSI NON QUOTATI: 0.5x45°	A	6	30	120	400	2000			
	TOLLERANZE ANGOLARI: ± 30'	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

0	1	2	3	4	5	6	7	8	9
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SAFETY PARAMETERS T-NC/8-API	
POWER SUPPLY pin 1-2	MAX TERMINALS 1-2-3 U <sub>i</sub> = 28V or U <sub>i</sub> = 26,6V I <sub>i</sub> = 120mA or I <sub>i</sub> = 135mA P <sub>i</sub> = 840mW or P <sub>i</sub> = 900mW C <sub>i</sub> = 30nF L <sub>i</sub> = 200µH
SIGNAL pin 2-3	U <sub>o</sub> = 28V I <sub>o</sub> = 120mA P <sub>o</sub> = 840mW C <sub>o</sub> = 2nF L <sub>o</sub> = 90µH Lo/R <sub>o</sub> = 40µH/Ω
SENSOR connector 4	U <sub>i</sub> = 28V I <sub>i</sub> = 120mA P <sub>i</sub> = 840mW C <sub>i</sub> = 1nF* L <sub>i</sub> = 80µH

SAFETY PARAMETER SENSOR ST-NC/8	SAFETY PARAMETER CABLE CPT-NC/8
U <sub>i</sub> = 28V I <sub>i</sub> = 120mA P <sub>i</sub> = 840mW C <sub>i</sub> = 1nF* L <sub>i</sub> = 80µH	U <sub>i</sub> = 28V I <sub>i</sub> = 120mA P <sub>i</sub> = 840mW C <sub>i</sub> = 1nF* L <sub>i</sub> = negligible

\* TOTAL CABLE LENGTH MAX 12mL

PROTECTION LEVEL :

CONVERTER T-NC/8-API : ATEX II 1G Ex Ia IIC T6/T5 Gb @ Tamb -30 ÷ +60/+80 °C  
IECEX Ex Ia IIC T6/T5 Gb

SENSOR ST-NC/8 : OPERATING TEMPERATURE -55 / +175°C \*\*

CABLE CPT-NC/8 : OPERATING TEMPERATURE -55 / +175°C \*\*

\*\* SENSOR ST-NC/8 AND CABLE CPT-NC/8 HAVE OPERATING TEMPERATURE FROM -55°C UP TO +175°C  
THE TEMPERATURE CLASSIFICATION DEPENDS OF THE MACHINE TEMPERATURE ON WHICH THE PRODUCT IS FITTED :  
T6 UP TO +60°C; T5 UP TO +80°C; T4 UP TO +110°C; T3 UP TO +175°C

**HAZARDOUS AREA**

**SAFE AREA**