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CEMB
BALANCING MACHINES

SAFETY INSTRUCTIONS

VIBRATIONS TRANSMITTER - MOD. TR-26 / TR-27 ATEX

**Type of protection Ex ia
Type of protection Ex ec – Ex tc**

Document No. I107PRD of 05/09/18 (Rev. 04)

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1. Product specification



This transmitter can provide an electrical signal directly proportional to the vibration of the point to which it is fastened, with direct interface to an acquisition system made in 2-wire technique (4-20 mA current loop).

Typical applications:

Vibrations measurement on machinery parts such as motors, bearings, pumps, etc..

Electrical characteristics

Rated voltage	24 V
Rated current	4-20mA loop

Environmental conditions

Transmitter temperature	-60° to +75° C T6 -60° to +90° C T5 -60° to +120° C T4
Transmitter humidity	Max 100%
Transmitter	TR-26: IP65 EN 60529/10.91 TR-27: IP68 EN 60529/10.91

2. Limits of use - ATEX marking

Foreword

The safety measures and the equipment used on the installation, operation and maintenance site, must follow the specific instructions contained in this manual. They must also comply with the applicable equipment rules (basic standards of the installation site) and the additional ones for the areas with risk of explosion due to gas presence: IEC 60079-14 and IEC 60079-17 for installation and verifications, as well as IEC 60079-19 for maintenance and repairs (unless otherwise specified).

These safety instructions refer to installation, use and maintenance of the TR-26 / TR-27 transmitter. The equipment was designed and realised according to IEC 60079-0, IEC 60079-7, IEC 60079-11 and IEC 60079-31 rules, and in conformance to directive ATEX 2014/34/UE.

These instructions have been conceived for installers and users adequately trained, with a basic technical expertise on using and starting up of electrical machinery and plants, in places with danger of explosion.

ATEX marking

The equipment covered by these instructions is characterized by the following protection modality:

Model with STAINLESS steel connector or TR-27 with integral cable:

II 1 G Ex ia IIC T6/T5/T4 Ga
II 1 D Ex ia IIIC T 85/100/135°C Da
I M1 Ex ia I Ma

II 3 G Ex ec IIC T6/T5/T4 Gc
II 3 D Ex tc IIIC T 85/100/135°C Dc

Model TR-26 with ALUMINIUM steel connector:

II 2 G Ex ia IIC T6/T5/T4 Gb
II 2 D Ex ia IIIC T 85/100/135°C Db



II 3 G Ex ec IIC T6/T5/T4 Gc
II 3 D Ex tc IIIC T 85/100/135°C Dc

The indications contained in these safety instructions must be observed in addition to what prescribed in the user manual provided to Customer.

The installer and the user are always responsible for the correspondence of the installation sites with the above limits and features.

The nameplate data for the various configurations are shown by Drawing No. 04PT024775, 04PT024776 and 04PT024778.

Legenda: safety nameplate data

II I	Other than mining zones Mining zone
1 G 2 G 3 G 1 D 2 D 3 D M1	Zona 0 for GAS Zona 1 for GAS Zona 2 for GAS Zona 0 for DUST Zona 1 for DUST Zona 2 for DUST Mining
Ex ia Ex ec EX tc	Level of protection "ia" Level of protection "ec" Level of protection "tc"
II C III C I	Equipment of IIC group, suitable for substances (gas) of IIC group Equipment of IIIC group, suitable for substances (dust) of IIIC group Equipment of I group, suitable for mining
T6-T5-T4	Temperature Class T6 (85°C); T5 (100°C); T4 (135°C)
	Marking for European directives
	Marking for directive 94/9/CE and related technical rules
CESI 09 ATEX 045	Name of the laboratory issuing the type certificate; 09 = year of first release; 045 = number of certificate.
0722	Number of Notified Body (CESI) responsible of production system surveillance
Tamb	Ambient Temperature: – 60 / + 75°C T6 – 60 / + 90°C T5 – 60 / + 120°C T4
Ga – Gb – Gc Da – Db – Dc Ma	EPL – Equipment Protection Level

Notes:

- a) The equipment belonging to IIC group is also suitable for IIB and IIA groups;
- b) The equipment belonging to IIIC group is also suitable for IIIB and IIIA groups;
- c) The choice of the intrinsically safe equipment to interface must be made on the basis of the associated equipment output parameters.

Equipment used in hazardous area

WARNING:

Do not connect or disconnect when energized.

3. Equipment suitability to the installation site

For using in areas with danger of explosion, verify that the involved equipment is suitable for area classification and flammable substances which are present in the system.

The criteria for classification of areas with potentially explosive atmosphere are listed by EN 60079-10 standard.

The technical requirements of electrical installations in hazardous areas are listed by EN 60079-14 standard.

The essential safety requirements for potentially explosive atmosphere in hazardous areas are listed by European Directive 2014/34/UE (for the devices) and 1999/92/CE (for systems and plants).

The transmitter marked II 1 G and II 1 D can be installed in zone 0 or 1 or 2, interfaced by barriers compatible with the power supply parameters.

The transmitter marked II 2 G and II 2 D can be installed in zone 1 or 2, interfaced by barriers compatible with the power supply parameters.

The transmitter marked II 3 G and II 3 D can be installed in zone 2, interfaced by SELV / PELV or class 2 power supply.

On the nameplate, in addition to functional data, are also indicated the references to the notified bodies responsible for certification.

4. Installation

Mechanical assembly

The TR-26 transmitter must be fixed to the point where the vibrations have to be detected, usually on the bearing support of pumps, motors, fans, etc..

To ensure a good mechanical coupling between transmitter and support, it is necessary:

- in case of cylindrical thread, M8 or 1/4" 28 UNF:

- >> A flattening of the fixing surface

- >> A threaded hole, orthogonal to the surface, having depth of 12 mm

- >> A thin layer of grease

- in case of tapered thread:

- >> A threaded hole, 1/4" 18 NPT

Connection and electrical coordination

The electrical connection must be carried out by suitably trained personnel, according to drawing no. 87SEB2076, 87SEB9091, 87SE024901 and 87SE024799.

The only electrical connection concerns the power supply cable / signal, shielded bipolar type.

The equipment input / output parameters are defined in the following table and reported with marking:

TR-26		TR-27	
Ui=30.5V		Ui=30.5V	Ui=30.0V
Ii=97mA		Ii=97mA	Ii=100mA
Pi=0.74W	OR	Pi=0.74W	Pi=0.75W
Ci=0nF		Ci=xxnF*	Ci=xxnF*
Li=0uH		Li=xxuH*	Li=xxuH*

* Ci and Li parameters for TR-27 model are defined according to the cable length:

Ci=0.17 x Lcable [nF] Li=1.20 x Lcable [uH]

ATTENTION:

- **The intrinsically safe circuits must be powered by certified associated equipment complying with the electrical characteristics limits above mentioned.**
- **The installation in zone 2 for "ec" and "tc" protection mode can be performed without safety barrier using SELV / PELV or class 2 power supply with 24Vdc output (max 30.5 Vdc).**

The evaluation of the system composed by the associated equipment, the intrinsic safety equipment and the connection cables is not in charge to CEMB Spa and must be performed by qualified personnel in accordance with EN 60079-14.

5. Verifications and Maintenance

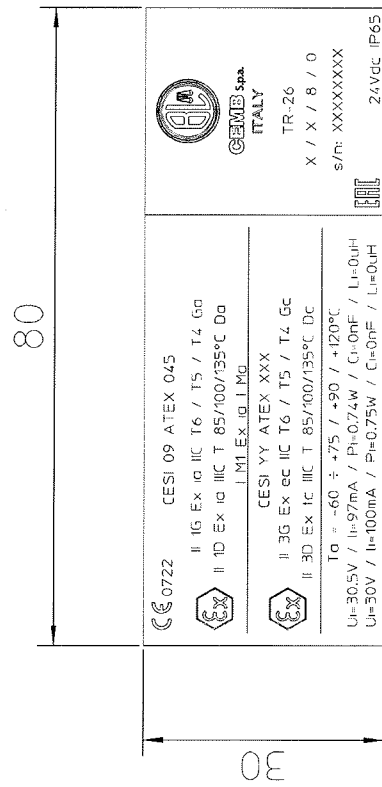
The equipment verification and maintenance operations, must be carried out according to EN 60079-17 criteria.

6. Repair

In case of malfunction or damages, it is recommended to send back the equipment to CEMB Spa for repair.

If not carried out by the manufacturer, all repairs shall be made according to EN 60079-19, at workshops suitably equipped for repairs and inspections, by operators having adequate technical expertise about protection modalities.

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					Rev.	Creazione	Descrizione Modifica		Disegnatore



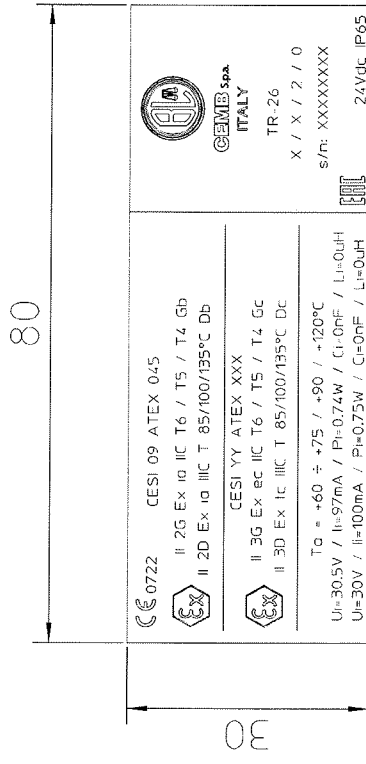
0722 CEE 09 ATEX 045
 II 1G Ex ia IIC T6 / T5 / T4 Gb
 II 1D Ex ia IIC T 85/100/135°C Da
 I M1 Ex ia I M0
 CEE YY ATEX XXX
 II 3G Ex ec IIC T6 / T5 / T4 Gc
 II 3D Ex tc IIC T 85/100/135°C Dc
 Ta = -60 ÷ +75 / +90 / +120°C
 Li=30.5V / Ii=97mA / Pli=0.74W / Ci=0mF / Li=0uH
 Li=50V / Ii=100mA / Pli=0.75W / Ci=0mF / Li=0uH
GEMB s.p.a.
 ITALY
 TR-26
 X / X / 8 / 0
 s/n: XXXXXXXX
 24Vdc IP65

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

LASER MARKING DIRECTLY ON THE TRANSMITTER BODY
 MARCATURA EFFETTUATA CON LASER DIRETTAMENTE SUL CORPO DEL TRAMETTITORE

Data: 05/09/2018 Disegnatore: Andreatti, D. Cliente: Ordine :	GEMB Ing. Buzzi & C. - S.p.A. Costruzioni Elettro Meccaniche	SCALE FOGLIO 1 di 1 FORMATO A4	Tipo di macchina: Disegno: DESCRIZIONE: MARCATURA ATEX TR-26/XX/8/0	Cod: 04PT024775	Rev. A
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					Rev.	Creazione	Descrizione Modifica		Disegnatore

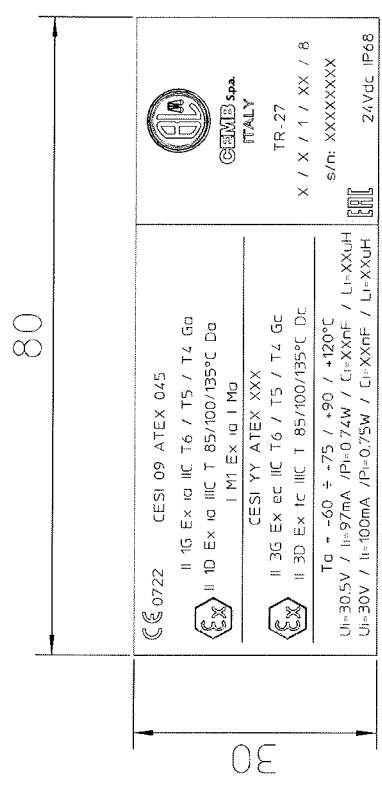


ISO-E	NOTE	TOLLERANZE ISO 2768-1H					
	RAGGI NON QUOTATI: 1 MAX	DA	0.5	7	31	121	401
Ra 3.2	SPUNSI NON QUOTATI: 0.5x45°	A	6	30	120	400	2000
	TOLLERANZE ANGOLARI: ± 30'	TOLL.	± 0.05	± 0.1	± 0.15	± 0.2	± 0.5

LASER MARKING DIRECTLY ON THE TRANSMITTER BODY
 MARCATURA EFFETTUATA CON LASER DIRETTAMENTE SUL CORPO DEL TRASMETTITORE

Data:	05/09/2018	Scala:	1 di 1	Rev.:	A
Disegnatore:	Andreotti D.	FOGLIO:	A4	Cod:	04PT024777
Cliente:		DESCRIZIONE:	MARCATURA ATEX TR-26/XX/2/0		
Ordine:					

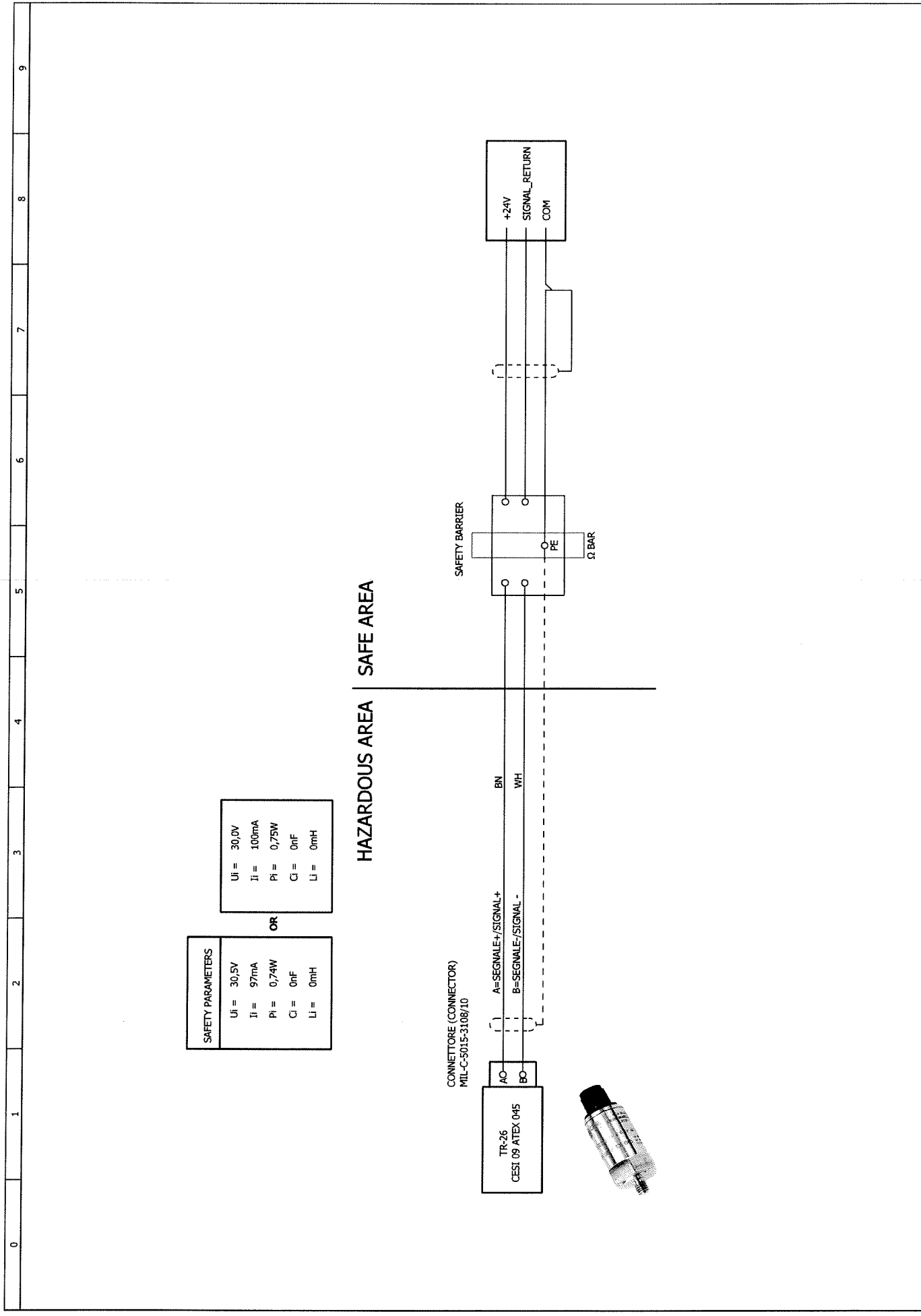
0	1	2	3	4	5	6	7	8	9
					Rev.	Creazione		Descrizione Modifica	Disegnatore



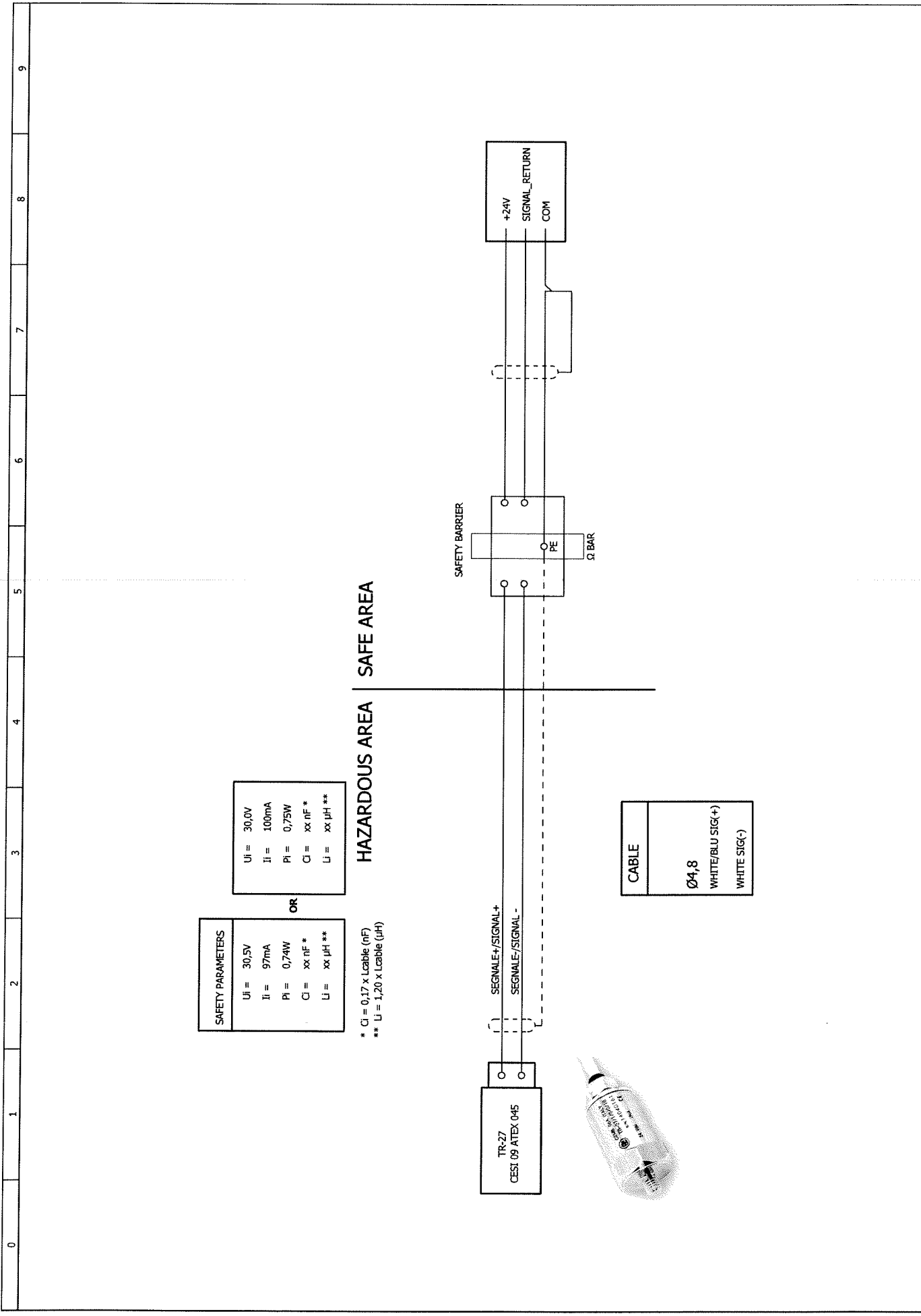
NOTE	TOLLERANZE ISO 2768-TH					
RAGGI NON QUOTATI: 1 MAX	DA	0.5	7	31	121	401
SPUNSI NON QUOTATI: 0.5x45°	A	6	30	120	400	2000
TOLLERANZE ANGOLARI: ± 30'	TOLL.	+0.05	+0.1	+0.15	+0.2	+0.5

LASER MARKING DIRECTLY ON THE TRANSMITTER BODY
 MARCATURA EFFETTUATA CON LASER DIRETTAMENTE SUL CORPO DEL TRASMETTITORE

Data:	05/09/2018	Scala:	1:1	Rev.:	A
Disegnatore:	Andreatti D.	FOGLIO:	1 di 1	Cod:	04PT024778
Cliente:		FORMATO:	A4		
Ordine:		DESCRIZIONE: MARCATURA ATEX TR-27/XX/1/XX/8			



0	1	2	3	4	5	6	7	8	9										
<p>HAZARDOUS AREA SAFE AREA</p>																			
<p>TR-26 CESI 09 ATEX 045</p>																			
<p>CONNETTORE (CONNECTOR) MIL-C-5015-3108/10</p>																			
<p>SAFETY PARAMETERS</p> <table border="1"> <tr> <td>Ui = 30,5V</td> <td>Ui = 30,0V</td> </tr> <tr> <td>Ii = 97mA</td> <td>Ii = 100mA</td> </tr> <tr> <td>Pi = 0,74W</td> <td>Pi = 0,75W</td> </tr> <tr> <td>Ci = 0nF</td> <td>Ci = 0nF</td> </tr> <tr> <td>Li = 0mH</td> <td>Li = 0mH</td> </tr> </table> <p>OR</p>										Ui = 30,5V	Ui = 30,0V	Ii = 97mA	Ii = 100mA	Pi = 0,74W	Pi = 0,75W	Ci = 0nF	Ci = 0nF	Li = 0mH	Li = 0mH
Ui = 30,5V	Ui = 30,0V																		
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Pi = 0,74W	Pi = 0,75W																		
Ci = 0nF	Ci = 0nF																		
Li = 0mH	Li = 0mH																		
<p>SAFETY BARRIER</p>																			
<p>Ω BAR</p>																			
<p>PE</p>																			
<p>+24V SIGNAL_RETURN COM</p>																			
<p>TYPE : VIBRATION TRANSMITTER PATH EPLAN : Z:\EPLAN\Propriet\CEMB SpA\SPECIALISTI</p>																			
<p>CUSTOMER : CEMB S.P.A. ORDER :</p>																			
<p>DATE 02/04/2014 USER: m_c_ade PRINT 19/10/2018 STD.</p>																			
<p>DATE 01/06/18 MILANO NAME</p>																			
<p>CHANGE</p>																			
<p>SHEET NAME : INSTALLATION TRANSMITTER TR-26 CESI 09 ATEX 045 IN HAZARDOUS AREA DRAWING NR. : 024801P</p>																			
<p>CEMB 2006 Bergamo, Italy Via Bergamo 9, ITALY DOCUMENT PROPERTY OF AS STANDARD</p>																			
<p>PLANT CODE PLACE SHEET = + 1</p>																			
<p>IX. SH.</p>																			



SAFETY PARAMETERS

Ui =	30,5V
Ii =	97mA
PI =	0,74W
CI =	xx nF *
Li =	xx µH **

OR

Ui =	30,0V
Ii =	100mA
PI =	0,75W
CI =	xx nF *
Li =	xx µH **

HAZARDOUS AREA SAFE AREA

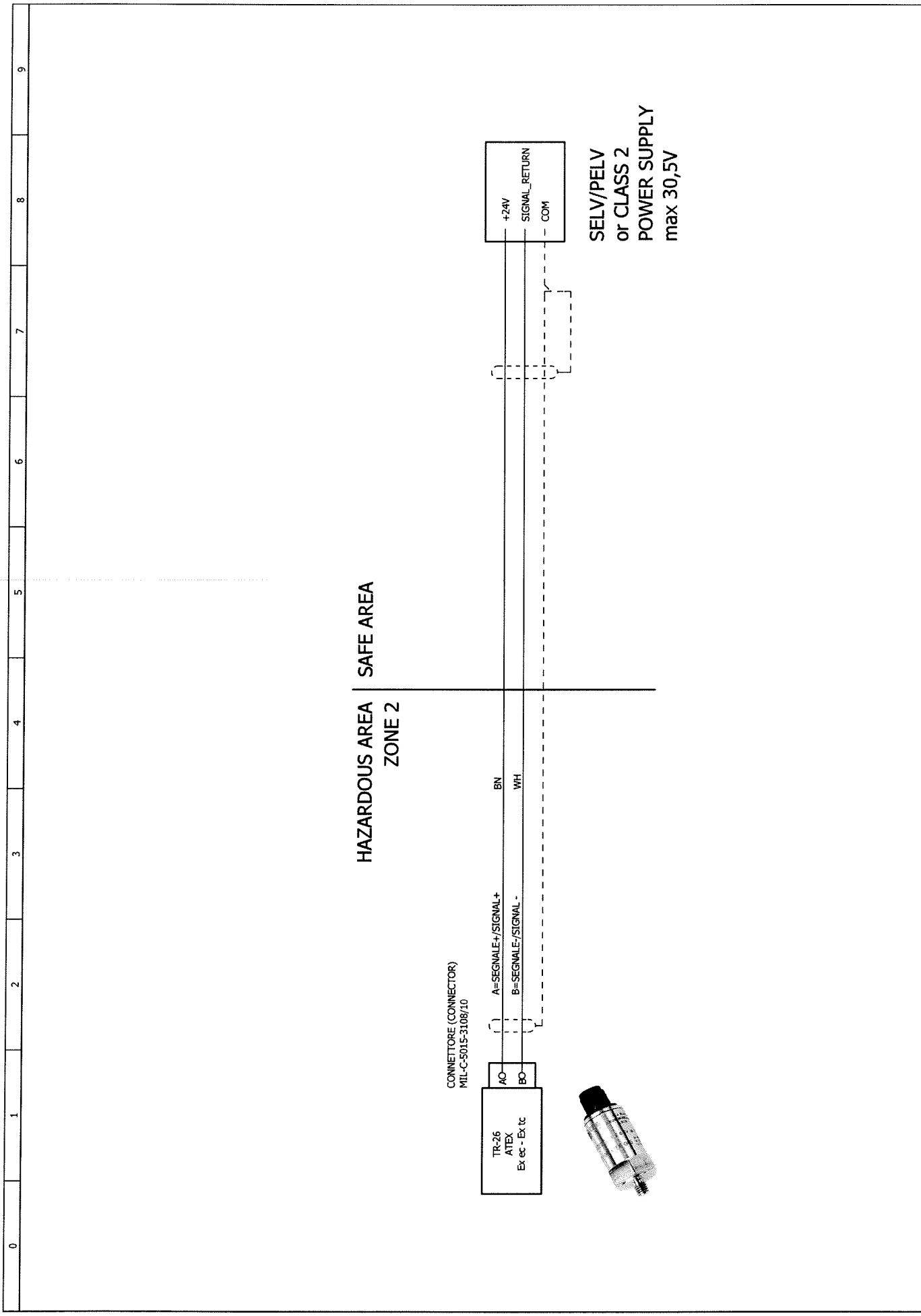
* Ci = 0,17 x Lcable (nF)
 ** U = 1,20 x Lcable (µH)

CABLE

Ø4,8
WHITE/BLU SIG(+)
WHITE SIG(-)



DATA	14/04/2015	CLIENTE :	CEMB S.P.A.	TIPO :	VIBRATOR TRANSMITTER
DISEGN.	MILANI L.	COMMESSA :		PERCORSO EPLAN :	
STAMPA	19/10/2018	ORIG.		\$ (IND. PROJECTS) SPECIALISTE	
NUMI					
MODIFICA					
DATA					
NUME					
NOTE					
DENOMINAZIONE :	INSTALLATION TRANSMITTER TR-27 CEST 09 ATEX 045 IN HAZARDOUS AREA				
PROPRIETA' DOCUMENTO (NORMA DIN 24)	CEMB 2009 Via Modelle del Lario (LC) Via Risorgimento 5, ITALY				
DISEGNO	MURO :	875EB9091	COD. IMP.	LOCAL.	
FOGLIO	+				
ES. S.					



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CHANGE	DATE	NAME	STD.	DATE	PRINT	USER	DATE	CUSTOMER :	TYPE :	SHEET NAME :	
				05/09/2018		MILJWE L.	19/10/2018	CEMB S.P.A.	VIBRATION TRANSMITTER	INSTALLATION TRANSMITTER TR-26 IN HAZARDOUS AREA	
								ORDER :	PATH PLAN :	DRAWING	
								Z:ZIELPLAN(P)C:CEMB S:PA/SPECIALIST	Z:ZIELPLAN(P)C:CEMB S:PA/SPECIALIST	PLANT CODE	PLACE
								ORIGIN	SUBST. FOR	=	+
										NR. :	1
										024801P	1
											RV. SH.



