IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification Scheme for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.: IECEx INE 12.0032X

Issue No: 3

Certificate history:
Issue No. 3 (2017-12-06)
Issue No. 2 (2016-03-25)
Issue No. 1 (2014-07-25)
Issue No. 0 (2013-02-22)

Status: **Current**

Date of Issue: **2017-12-06**

Applicant: **THERMO ENGINEERING S.r.l**
Via Giuseppina, 19
I - 26030 Malagnino (CR)
Italy

Equipment: **Thermometric probes type 111TE—/ or 112TE—/**

Optional accessory:

Type of Protection: **db, ta, tb, ia**

Marking:

For thermometric probes type 111TE—/:

Ex db IIC T6, T5, T4 or T3 Ga/Gb or Gb
Ex ta IIIC T85°C, T100°C, T135°C or T200°C Da / Ex tb IIIC T85°C, T100°C, T135°C or T200°C Db IP66 or IP68
or
Ex tb III C T85°C, T100°C, T135°C or T200°C Db IP66 or IP68

For thermometric probes type 112TE---/ :

Ex ia IIC T6, T5, T4 or T3 Ga/Gb or Ga and Ex ia III C T85°C, T100°C, T135°C or T200°C Da/Db or Da

Approved for issue on behalf of the IECEx Certification Body: Thierry HOUEIX

Position: Ex Certification Officer

Signature:
(for printed version)

Date: 2017-12-06

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting the Official IECEx Website.

Certificate issued by:

INERIS
Institut National de l'Environnement Industriel
et des Risques, BP n2
Parc Technologique ALATA
France

IECEx Certificate of Conformity

Certificate No:	IECEx INE 12.0032X	Issue No: 3
Date of Issue:	**2017-12-06**	Page 2 of 5
Manufacturer:	**THERMO ENGINEERING S.r.l** Via Giuseppina, 19 I - 26030 Malagnino (CR) **Italy**	

Additional Manufacturing location(s):

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements. This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended.

STANDARDS:

The electrical apparatus and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards:

IEC 60079-0 : 2011 Edition:6.0	Explosive atmospheres - Part 0: General requirements
IEC 60079-1 : 2014-06 Edition:7.0	Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures "d"
IEC 60079-11 : 2011 Edition:6.0	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
IEC 60079-26 : 2014-10 Edition:3.0	Explosive atmospheres – Part 26: Equipment with Equipment Protection Level (EPL) Ga
IEC 60079-31 : 2013 Edition:2	Explosive atmospheres - Part 31: Equipment dust ignition protection by enclosure "t"

*This Certificate **does not** indicate compliance with electrical safety and performance requirements other than those expressly included in the Standards listed above.*

TEST & ASSESSMENT REPORTS:

A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in

Test Report:

FR/INE/ExTR12.0031/03

Quality Assessment Report:

FR/INE/QAR11.0009/05

IECEx Certificate of Conformity

Schedule

EQUIPMENT:

Equipment and systems covered by this certificate are as follows:

The equipment is constituted by a connection head on which is fitted different type of probes, a transmitter can be installed inside the connection head.

For thermometric probes type 111TE---/, the connection head is protected by Ex db type of protection and it is covered by different IECEx certificates.

For thermometric probes type 112TE---/ the transmitters used inside the connection head are covered by an IECEx certificate of conformity (Ex ia Ga and Da) and the relevant parameters are mentioned into the equipment label.

The thermometric probes can also be fitted with different accessories as adaptors, blanking elements and three pieces union. Following accessories are included in the certificate:

Drawing	Description
TE-GNT03	Adaptor 3/4"NPT-M x 1/2" NTP-F
TE-GNT04	Adaptor 1/2"NPT-M x 3/4" NTP-F
TE-00041_C	Adaptor 3/4"NPT-M x 1/2" NTP-F
TE-00041_C	Adaptor 3/4"NPT-M x M20x1,5-F
TE-00041_C	Adaptor 3/4"NPT-M x M25x1,5-F
TE-00041_C	Adaptor 3/4"NPT-M x PG16
TE-00041_C	Adaptor 3/4"NPT-M x PG13,5
TE-00041_C	Adaptor 3/4"NPT-M x 1/2" GAS UNI 338-F
TE-00041_D; TE-TST10	Blanking element 3/4"NPT-M
TE-00041_D; TE-TST09	Blanking element 1/2" NTP-M

The different ambient temperatures and temperature classes are in accordance with the operating temperature of each component.

The thermometric probes 111TE get the degree of protection IP66 or IP68 in accordance with the type of connection head. See table 1

below.

Degree of protection for thermometric probes 112TE is in accordance with the type of connection head used. See tables 1 to 3 below.

SPECIFIC CONDITIONS OF USE: YES as shown below:

For thermometric probes type 111TE---/:

The gap and diametrical clearance of the different flamepath are lower than the values specified in the table of the IEC 60079-1 standard.

The width of the different flameproof joints is greater to these specified in tables of IEC 60079-1 standard.

For EPL Da with type of protection "Ex ta": The equipment shall be protected by an overcurrent protective device according to IEC 60079-31 clause 4.3.

The equipment can be mounted in a boundary wall between Zone 20 (Ex ta) and Zone 21 (Ex tb).

For thermometric probes type 112TE---/:

Thermometric probes must be powered by galvanic isolation associated apparatus

For thermometric probes including transmitter certified as equipment:

Additional specific conditions are those defined in the certificates and instructions of the transmitter included in the assembly.

IECEx Certificate of Conformity

Certificate No: IECEx INE 12.0032X Issue No: 3

Date of Issue: **2017-12-06** Page 5 of 5

DETAILS OF CERTIFICATE CHANGES (for issues 1 and above):

Issue 01:

1) Adding of new connection head type TE-00041 for thermometric probes 111TE and 112TE.
2) Adding of new connection heads types TTE100 and TTE2xx manufactured by F.P.L. for thermometric probes 111TE and 112TE.
3) Modification of i.s. parameters for thermometric probes 112TE and maximum dissipated power for thermometric probes 111TE.
4) Adding of a new configuration for thermometric probes 111TE and 112TE with soldered thermowell.
5) Modification of the 4th digit in the type designation of thermometric probes 111TE and 112TE to introduce the specific ambient temperature range -40°C to +180°C.
6) Modification of the 4th digit in the type designation of thermometric probes 111TE and 112TE to introduce the specific ambient temperature range -55°C to +80°C when the connection heads types TTE100 and TTE2xx manufactured by F.P.L. are used.
7) Adding of a 6th digit in the type designation of thermometric probes 111TE to specify the type and the size of cable entries.

Issue 02:

- Update from the IEC 60079-1:2007 to the IEC 60079-1:2014 standard;
- Update from the IEC 60079-31:2008 to the IEC 60079-31:2013 standard;
- Modification of the minimum ambient temperature to -60°C for the thermometric probes 111TE and 112TE when coupled with the connection heads type TST and TE-00041;
- Modification of intrinsically safe parameters in accordance with the maximum ambient temperature and gas group;
- Modification of the "routine examinations and tests" section.

Issue 03:
•Update from the IEC 60079-26:2006 to the IEC 60079-26:2014 standard;
•Addition of new connection heads covered by IECEx certificates;
•Addition of new transmitters covered by IECEx certificates;
•Modification of the maximum dissipated power for 111TE thermometric probe;
•Modification of the routine test section;
•Modification of the specific conditions of use section;
•Update of the technical documentation including the addition of accessories.

Annex:

IECEx INE 12.0032X-03_Annex.pdf

IECEx Certificate of Conformity

Certificate No.: IECEx INE 12.0032X

Issue No.: 3

Annex: IECEx INE 12.0032X-03_Annex.pdf

PARAMETERS RELATING TO THE SAFETY

For thermometric probes type 111TE---/:

Maximum Voltage : 60 V

Maximum current : 30 mA

Maximum dissipated power : 1 W

For thermometric probes type 112TE---/:

Intrinsic safety parameters without transmitter:

Group	Ui (V)	Ii (mA)	Ci (nF)	Li (µH)
IIC	30	100	5 *	30 *
IIB	30	250	5 *	30 *
IIA	30	340	5 *	30 *

Pi : see tables below

* :with maximum length cable = 30 m

When there are 2 Exi (dual probe) circuits in the same probe and the separation distance through the solid insulation is < 0.5 mm and/or < 0,7 mm through the compound/resin (see 6.3.5 of IEC 60079-11), the parameters for each Exi circuit (i.e. for each probe) are:

Group	Ui (V)	Ii (mA)	Ci (nF)	Li (µH)
IIC	20	50	5 *	30 *
IIB	20	130	5 *	30 *
IIA	20	190	5 *	30 *

Pi : see tables below

* :with maximum length cable = 30 m

Maximum Power input for single probe:

For Temperature Class T3 (T200°C)

Maximum ambient temperature °C	Maximum Power Input (Pi) W
40	2.094
50	1.959
60	1.824
70	1.689
85	1.486
120	1.013
180	0.202

For Temperature Class T4 (T135°C)

Maximum ambient temperature °C	Maximum Power Input (Pi) W
40	1.216
50	1.081
60	0.945
70	0.810
85	0.608
120	0.135

For Temperature Class T5 (T100°C)

Maximum ambient temperature °C	Maximum Power Input (Pi) W
40	0.743
50	0.608
60	0.472
70	0.337
85	0.135

For Temperature Class T6 (T85°C)

Maximum ambient temperature °C	Maximum Power Input (Pi) W
40	0.540
50	0.405
60	0.270
70	0.135

Maximum Power input for dual probe (for each probe):

For Temperature Class T3 (T200°C)

Maximum ambient temperature °C	Maximum Power Input (Pi) W
40	1.047
50	0.979
60	0.912
70	0.844
85	0.743
120	0.506
180	0.101

For Temperature Class T4 (T135°C)

Maximum ambient temperature °C	Maximum Power Input (Pi) W
40	0.608
50	0.540
60	0.472
70	0.405
85	0.304
120	0.067

For Temperature Class T5 (T100°C)

Maximum ambient temperature °C	Maximum Power Input (Pi) W
40	0.371
50	0.304
60	0.236
70	0.168
85	0.067

For Temperature Class T6 (T85°C)

Maximum ambient temperature °C	Maximum Power Input (Pi) W
40	0.270
50	0.202
60	0.135
70	0.067

NOTE for double probe used as a single probe:

In Ex ia equipment with two elements (double RTD or double TC), end user can connect one alone element applying the one probe characteristics and parameters.

WARNING 1: End user must assure (condemn) the not connected probe: this second probe (Ex ia circuit) has not and never to be used.

WARNING 2: End user need to apply a procedure to forbids the connection of the second probe.

The thermometric probes can be used in a range of ambient temperature within -60°C to +180°C in accordance with the type of connection head and the transmitter. The different possibilities are defined in the tables below.

The restrictions of uses of each component are detailed in the descriptive documents of the manufacturers.

Connection heads (including transmitter) certified "Ex d" and "Ex tb" as equipment can also be used for probes 111TE if they are intended specifically to be mounted directly onto a temperature sensing probe via ISO metric / NPT Ex d threaded joint and if they are in accordance with the limitations defined in the descriptive documents of the manufacturers:

- IECEx certified with types of protection "Ex d" for IIC and "Ex tb" for IIIC.
- Internal free volume is less than 260 cm3.
- Reference pressure is less than 12 bar.
- Assembly according to the drawings defined below. Max free volume under the head < 10 cm3.
- Temperature classification of the assembly is defined according to the Temperature classification of the head (including transmitter).
- Maximum ambient temperature of the assembly is defined according to the maximum ambient temperature of the head (including transmitter) but shall not be more than 180°C.
- Minimum ambient temperature of the assembly is defined according to the minimum ambient temperature of the head (including transmitter) but shall not be less than -60°C.
- Tcable of the assembly is defined according to the Tcable of the head (including transmitter).
- IP rating of the assembly is defined according to the IP rating of the head (including transmitter). IP rating of the head (including transmitter) shall be IP 66 or IP 67 or IP 68.
- The marking of the assembly is executed on additional nameplate.
- In case the head (including transmitter) has certificate with special conditions "X":

Additional special conditions are those defined in the certificate and instructions of the transmitter included in the assembly.

These special conditions must be reviewed and verified regarding the conditions of certification of the assembly.

The certificate and the instructions manual of the head (including transmitter) shall be provided to end user together with the assembly.

List of the components covered by separated IECEx certificates and statement of the assessments regarding the older editions of the standard:

Table 1 - Connection heads for thermal probes 111TE and 112TE:

Manufacturer	Type	Certificate	IP	Standards
FPL	TTE108C91G TTE100C31G TTE100C41G TTE100C61G	IECEx CES 14.0005U	IP 66	IEC 60079-0:2011 IEC 60079-1:2007 (1) IEC 60079-31:2008 (2)
FPL	TTE200CA44G1 TTE200CA66G1	IECEx CES 14.0006U	IP 66	IEC 60079-0:2011 IEC 60079-1:2007 (1) IEC 60079-31:2008 (2)
LIMATHERM	XD-AD with O-ring VQM rubber (silicone)	IECEx FTZU 14.0003U	IP 68	IEC 60079-0:2011 IEC 60079-1:2014 IEC 60079-31:2013
LIMATHERM	XD-SD with O-ring VQM rubber (silicone)	IECEx FTZU 17.0008U	IP 68	IEC 60079-0:2011 IEC 60079-1:2014 IEC 60079-31:2013
IME	8080, 8075, 8066, 7080	IECEx SIR 07.0111U	IP 68	IEC 60079-0:2011 IEC 60079-1:2007 (1) IEC 60079-31:2008 (2)
IME	1080WM	IECEx SIR 09.0006U	IP 68	IEC 60079-0:2011 IEC 60079-1:2007 (1) IEC 60079-31:2008 (2)
	1080SM			
	1088			
	1080ST-01		IP 66 / IP 68	
Thermo Engineering	TST	IECEx INE 12.0001U	IP 66	IEC 60079-0:2011 IEC 60079-1:2014 IEC 60079-31:2013
Thermo Engineering	TE-00041	IECEx INE 14.0007U	IP 66	IEC 60079-0:2011 IEC 60079-1:2014 IEC 60079-31:2013
CORTEM	S....14, S....16, S....26, S....36, SWS16, SWS26, SWS26/21	IECEx CES 15.0012U	IP 66	IEC 60079-0:2011 IEC 60079-1:2014 IEC 60079-31:2013

(1): Not impacted by the major technical changes until the standard IEC 60079-1:2014

(2): Not impacted by the major technical changes until the standard IEC 60079-31:2013

Table 2 - Connection heads only for thermal probes 112TE only:

Manufacturer	Type	IP
COELBO	S, SF	IP 66
THERMO ENGINEERING	5009	IP 66
COSIME	00020,21,22,23	IP 66
FPL	TTB200 - TTB231 series	IP 66
LIMATHERM	DNAG series (Screw cover)	IP 68
IME	1080WE	IP 66
IME	1080SE	IP 66

Table 3 - Transmitters for probes 112TE:

Manufacturer	Type	Certificate	Single probe	Double probe	IP
PR	5335D/5337D	IECEx KEM 10.0083X	IIC	IIC	N/A
PR	5333D/5343B	IECEx DEK 13.0036X	IIC	N/A	N/A
YOKOGAWA	YTA70...	IECEx KEM 10.0086	IIC	IIC	N/A
Inor	IPAQ C520X	IECEx KIWA 14.0001X	IIC	IIC	N/A
Inor	IPAQ C202X	IECEx KIWA 15.0015X	IIC	N/A	N/A
PR	7501A (*)	IECEx DEK 15.0039X	IIC	IIC	*not specified*
PR	7501B (*)		IIC	IIC	*not specified*
YOKOGAWA	YTA_ -J or -D (*) (**)	IECEx FMG 16.0014X	IIC	IIB	IP66
YOKOGAWA	YTA_ -F or -G (*) (**)		IIC	IIB	IP66
ROSEMOUNT	3144P HART (*) (**)	IECEx BAS 07.0002X	IIC	IIB	*not specified*
ROSEMOUNT	3144P FIELDBUS (*) (**)	IECEx BAS 07.0004X	IIC	IIC	*not specified*

(*) including connection head + transmitter

(**) for gas applications only

MARKING

Marking has to be readable and indelible; it has to include the following indications:

1. **For thermometric probes type 111TE---/:**
   - THERMO ENGINEERING S.r.l
   - I - 26030 Malagnino (CR)
   - 111TE... (1)
   - IECEx INE 12.0032X
   - (Year of construction)
   - Ex db IIC T(*) Ga/Gb or Ex db IIC T(*) Gb
   - Ex ta IIIC T(*) Da / Ex tb IIIC T(*) Db IP(**) or Ex tb IIIC T(*) Db IP(**)
   - T. amb.: (*)
   - T. Cable: (*)
   - Cable entry: See instructions

(1) Type is completed by letters and numbers corresponding to the manufacturer variations.

(*) See table below

(**) IP66 or IP68 in accordance with the type of connection head.

2. **For thermometric probes type 112TE---/:**
   - THERMO ENGINEERING S.r.l
   - I - 26030 Malagnino (CR)
   - 112TE... (1)
   - IECEx INE 12.0032X
   - (Year of construction)
   - Ex ia IIC or IIB T(*) Ga/Gb or Ex ia IIC or IIB T(*) Ga
   - Ex ia IIIC T(*) Da/Db or Ex ia IIIC T(*) Da
   - T. amb.: (*)
   - T. Cable: (*)

(1) Type is completed by letters and numbers corresponding to the manufacturer variations.

(*) See table below

Maximum ambient temperature	Temperature class		Cable temperature
	Gas	Dust	
70°C	T6	T85°C	80°C
85°C	T5	T100°C	95°C
120°C	T4	T135°C	130°C
180°C	T3	T200°C	190°C

ROUTINE EXAMINATIONS AND TESTS

For welded thermometric probes type 111TE with connection heads covered by:

IECEx SIR 09.0006U certificate

In accordance with clause 16.1 of the IEC 60079-1 standard, an overpressure test of a period comprised between 10 and 60 seconds under 19.9 bar shall be performed on each sample before delivery.

IECEx INE 12.0001U, IECEx INE 14.0007U, IECEx CES 14.0005U, IECEx CES 14.0006U, IECEx SIR 07.0111U, IECEx FTZU 14.0003U, IECEx FTZU 17.0008U and IECEx CES 15.0012U (for -20°C) certificates

In accordance with clause 16.3 of the IEC 60079-1 standard, the integrity of the welds shall be verified with one of the alternative inspection methods on each sample before delivery.

IECEx CES 15.0012U (for -40°C) certificate

In accordance with clause 16.1 of the IEC 60079-1 standard, an overpressure test of a period comprised between 10 and 60 seconds under 19.3 bar shall be performed on each sample before delivery.