IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification System for Explosive Atmospheres

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

Certificate No.:	**IECEx CES 13.0026X**	Page 1 of 4
Status:	**Current**	Issue No: 1

Date of Issue: 2021-03-10

Applicant: **Endress+Hauser Wetzer GmbH+Co. KG**
Obere Wank 1
D-87484 Nesselwang
Germany

Equipment: **Modular MultiSens Linear and Multipoint Thermometer iTHERM®, type TMS12 and TM9xx**

Optional accessory:

Type of Protection: **Flameproof enclosures 'd'; Intrinsic Safety 'i'; Dust ignition protection 't'**

Marking:
Ex db IIC T6…T1 Gb (for TM9xx only);

Ex db IIC T6…T1 Ga/Gb;

Ex ia IIC T6…T1 Ga/Gb;
Ex ia/db IIC T6…T1 Ga/Gb;
Ex tb IIIC T85°C…T450°C Da/Db;

Ex ia IIIC T85°C…T450°C Da/Db;
Ex ia/tb IIIC T85°C…T450°C Da/Db;

Ex ta/tb IIIC T85°C…T450°C Da/Db (for TM9xx only).

Approved for issue on behalf of the IECEx
Certification Body:

Mirko Balaz

Position:

Head of IECEx CB

Signature:
(for printed version)

Date:

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2. This certificate is not transferable and remains the property of the issuing body.
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Certificate issued by:

IECSI
Centro Elettrotecnico
Sperimentale Italiano S.p.A.
Via Rubattino 54
20134 Milano
Italy

IECEx Certificate
of Conformity

Manufacturer:	**Endress+Hauser Wetzer GmbH + Co. KG** Obere Wank 1 D-87484 Nesselwang **Germany**

Additional manufacturing locations:	**Endress + Hauser Sicestherm S.r.l.** Via Martin Luther King, 7/9 I-20060 Pessano con Bornago (MI) **Italy**	**Endress+Hauser Wetzer (Suzhou) Co. Ltd.** Jiang-Tian-Li-lu No.31, 215021 Suzhou-SIP (P.R. China) **China**
	Endress+Hauser Wetzer USA INC 2413 Endress Place Greenwood, IN 46143 **United States of America**	**Endress+Hauser Wetzer (India) Pvt. Ltd.** M-171/173, MIDC, Waluj Aurangabad – 431 136 **India**

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 equipment 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 60079-0:2017 Edition:7.0	Explosive atmospheres - Part 0: Equipment - 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 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 Reports:

IT/CES/ExTR13.0027/00   IT/CES/ExTR13.0027/01

Quality Assessment Report:

DE/TUN/QAR06.0009/09

EQUIPMENT:
Equipment and systems covered by this Certificate are as follows:

iTHERM® TMS12 MultiSens Linear

iTHERM® Modular Multipoint Thermometer type TM9xx

The approved structure for thermometers covers only the standard versions of TMS12 and TM911.

The Modular Multipoint-Thermometer **iTHERM®**, type **TM9xx** is a thermometric assembly which allows to measure temperature simultaneously in several points, aligned along a straight direction. The construction, consists of replaceable sensible elements (TC or RTD inserts) for hazardous areas and applications with high process pressure and a connection head containing terminal blocks or temperature transmitters.

The construction can be manufactured in two versions:

- standard, the connection head is connected, by means of a lamination joint, directly with the inserts;

- remote, the connection head is connected, by means of a lamination joint by a flexible conduit. This version is only suitable for the type of protection Ex i and Ex t.

The MultiSens Linear iTHERM® **TMS12** is a multipoint sensors with at least two and up to 12 thermocouples and/or RTDs elements inside a thermowell tube *(if any)*, distributed at different location *(or distributed at different immersion lengths)* to measure a temperature profile. This new equipment shares with **TM9xx**, some mechanical parts of which the main is the lamination joint.

Modular MultiSens Linear and Multipoint Thermometer iTHERM®, type TMS12 and TM9xx haracteristics are further described in the Annexe of this certificate.

SPECIFIC CONDITIONS OF USE: YES as shown below:

- Install and use the equipment according to the manufacturer's Safety Instructions and any other valid standards and regulations *(e.g. IEC 60079-14, IEC 60079-25)*.
- The manufacturer, based on the maximum operating temperature of the process, shall establish and place on the nameplate the assigned values for the Temperature Class / Surface Temperature of the equipment.
- It is installer responsibility to guarantee that the maximum ambient temperature at the installation point of *Connection Head*, is according to Manufacturer documentation.
- If the equipment is mounted between an area requiring EPL Ga and an area with EPL Gb, the iTHERM®, **TM9xx** and **TMS12** shall be installed in a way that process connection meets the requirements of clause 4.3 of IEC 60079-26.
- The iTHERM®, **TM9xx** and **TMS12** in the Ex-ia configurations shall be supplied by barriers with galvanic insulation, certified according to IEC 60079-0, IEC 60079-11, within the limits of the electrical characteristics.
- The *Connection Head* enclosures made in light alloy shall be mounted in a way to avoid an ignition hazard due to impact or friction.
- The Ambient Temperature range of the iTHERM® **TM9xx** and **TMS12** apparatus, may vary depending on the number and the type of the transmitters mounted inside to the *Connection Head*. For a safe use of the products, the Safety Instructions have to be followed precisely.
- Do not open the *Connection Head* when energized.
- The accessories for the cable entries shall guarantee a minimum degree of protections IP66 in according to IEC 60529.
- For ambient temperatures above +70°C, shall be used accessories with an operational temperature at least +5 K higher than the surrounding environment.
- Conditions of the installation, use and maintenance of the Products, are included within the Safety Instructions. For a safe use these Instruction have to be followed precisely.

DETAILS OF CERTIFICATE CHANGES (for issues 1 and above)

Variation 1.1
New product MultiSens Linear iTHERM® TMS12 which shares with TM9xx, some mechanical parts.

Variation 1.2
Extended, for some product assembly, the ambient temperature range up to -50 °C.

Variation 1.3
Updated the list of devices (terminal blocks and transmitters) that can be installed inside the connection head.

Variation 1.4
The main thread of the "lamination joint" in addition to 2" NPT ANSI B1.20 , can be alternatively ISO W50 x 1.5 or ISO W63x1.5.

Variation 1.5
The equipment, previously assessed in accordance to IEC 60079-0:2011, IEC 60079-1:2007, IEC 60079-26:2006, IEC 60079-31:2008, has been re-evaluated on the basis of the standard IEC 60079-0:2017, IEC 60079-1:2014, IEC 60079-26:2014, IEC 60079-31:2013.

Annex:

ENDRESS+H - IECEx CES 13-0026X Issue 1 - ANNEX - iTHERM®_TMxxx.pdf

IECEx Certificate of Conformity

Annex to certificate: **IECEx CES 13.0026X Issue No.:1 of 2021-03-10**
Applicant: **Endress+Hauser Wetzer GmbH+Co.KG**
   Obere Wank 1, 87484 Nesselwang, Germany
Apparatus: **Modular MultiSens Linear and Multipoint Thermometer iTHERM®,**
   type TMS12 and TM9xx

Description of the equipment:

iTHERM® TMS12 MultiSens Linear
iTHERM® Modular Multipoint Thermometer type TM9xx
The approved structure for thermometers covers only the standard versions of TMS12 and TM911.

The Modular Multipoint-Thermometer **iTHERM®**, type **TM9xx** is a thermometric assembly which allows to measure temperature simultaneously in several points, aligned along a straight direction. The construction, consists of replaceable sensible elements (TC or RTD inserts) for hazardous areas and applications with high process pressure and a connection head containing terminal blocks or temperature transmitters.
The construction can be manufactured in two versions:
- standard, the connection head is connected, by means of a lamination joint, directly with the inserts;
- remote, the connection head is connected, by means of a lamination joint by a flexible conduit. This version is only suitable for the type of protection Ex i and Ex t.

The MultiSens Linear iTHERM® **TMS12** is a multipoint sensors with at least two and up to 12 thermocouples and/or RTDs elements inside a thermowell tube *(if any)*, distributed at different location *(or distributed at different immersion lengths)* to measure a temperature profile. This new equipment shares with **TM9xx**, some mechanical parts of which the main is the lamination joint.
The TMS12 is equipped with an enclosure *(connection head)*, the type of which is dependent on the installation and the type of protection required by the electrical construction.
Such a connection head can accommodate additional parts such as temperature transmitters or terminal blocks, or may be used as a standalone solution: in this case a flexible conduit leads the connection cables to a remote junction box or to a safe area.

Application

In the principle, the equipment consists of the following main sub-assemblies.
   - **Insert**: done by a metal sheathed sensing measuring element (thermocouple or thermoresistance),
   - **Process connection**: represented typically by an ASME or EN flange.
   - **Head**: It is composed of a junction box provided with its components.
   - **Neck**: It is designed to support the head.
   - **Thermowells**: They are directly welded on the process connection.
   - **Safety Camber or Diagnostic Chamber**: this subassembly consists in a closed volume that ensures safe leakage containment.

EPL Ga *(Zone 0)* or EPL Da *(Zone 20)* is applicable for the part of the iTHERM® **TMS12** and iTHERM® **TM9xx** continuously, immersed in process medium and exposed to process operation conditions. Parts in Zone 0 are the thermowell with the bundle of thermocouple/RTD inside and part of the reinforced sleeve.

EPL Gb *(Zone 1)* or EPL Db *(Zone 21)* is applicable for the part of the iTHERM® **TMS12** and iTHERM® **TM9xx** not immersed in process medium and exposed to environment operation conditions. This part consists on the external part including junction box and its fittings, frame/tube neck, extension cables of inserts, diagnostic chamber *(if any)* and compression fittings.
The separation between the two classified zones is realized by the process connection and the thermowell *(either primary or secondary)* which shall conform to IEC 60079-26 requirements.

Type of protection:

IECEx marking for Modular Multipoint Thermometer iTHERM® type **TM9xx**

Model	Option Code	Marking	
TM9xx	-ID	Ex db IIC T6…T1 Gb	
TM9xx	-IE	Ex ia IIIC T85°C…T450°C Da/Db	
TM9xx	-IF	Ex tb IIIC T85°C…T450°C Db	
TM9xx	-IJ	Ex ia IIC T6…T1 Ga/Gb	
TM9xx	-I7	Ex db IIC T6…T1 Ga/Gb	Ex ta/tb IIIC T85°C…T450°C Da/Db
TM9xx	-I8	Ex ia/db IIC T6…T1 Ga/Gb	Ex ia/tb IIIC T85°C…T450°C Da/Db

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Applicant: **Endress+Hauser Wetzer GmbH+Co.KG**
Obere Wank 1, 87484 Nesselwang, Germany
Apparatus: **Modular MultiSens Linear and Multipoint Thermometer iTHERM®, type TMS12 and TM9xx**

Type of protection *(continue):*

IECEx marking for MultiSens Linear iTHERM® **TMS12**

Model	Option Code	Marking	
TMS12	-ID	Ex db IIC T6…T1 Ga/Gb	
TMS12	-IE	Ex ia IIIC T85°C…T450°C Da/Db	
TMS12	-IF	Ex tb IIIC T85°C…T450°C Da/Db	
TMS12	-IJ	Ex ia IIC T6…T1 Ga/Gb	
TMS12	-I7	Ex ia/db IIC T6…T1 Ga/Gb	Ex ia/tb IIIC T85°C…T450°C Da/Db

Identification of the equipment type **TM9xx**

The product name defines its own configuration and consists of a main root that defines the whole family followed by a string of digits that defines the customized characteristics of each selection.

The approved structure for thermometers covers only the type TM911 *(standard configuration)* as follows:

Product name: **i-Therm®**; type (root): **TM911-**

TM9 1 1 –

1: metric version (dimensions all in mm)

1:with safety chamber – with main thermowell (standard configuration)

The code of the **TM9xx** apparatus can be read with the below options.

TM911-a b *c d e f g h l j k l m n o p q r s t u v w x y z* **aa** *ab* **ac** *ad ae af ag ah ai aj ak al am*

a --> Approval		ID	*IECEx Ex d IIC Gb*
		IE	*IECEx Ex ia IIIC Da/Db*
		IF	*IECEx Ex tb IIIC Db*
		IJ	*IECEx Ex ia IIC Ga/Gb*
		I7	*IECEx Ex d IIC Ga/Gb, Ex ta/tb IIIC Da/Db*
		I8	*Ex ia/db IIC T6…T1 Ga/Gb Ex ia/tb IIIC T85°C…T450°C Da/Db*
b --> Design Temperature TS		1	<= 100°C
		2	<= 200°C
		3	<= 300°C
		4	<= 425°C
aa --> Electrical Connection		0A	*Terminals for 1x TC (2 pieces per insert)*
		0B	*Terminals for 2x TC (4 pieces per insert)*
		0C	*Terminals for 1x RTD 3-wire (3 pieces per insert)*
		0D	*Terminals for 1x RTD 4-wire (4 pieces per insert)*
		0E	*Terminals for 3x RTD 3-wire (6 pieces per insert)*
		1B	*4-20mA (1-channel TMT181, head transmitter DIN B)*
		2A	*HART (1-channel TMT182, head transmitter DIN B)*
		2B	*HART (2-channel TMT182, SIL head transmitter DIN B)*
		3A	*FF (2-channels TMT85, head transmitter DIN B)*
		3B	*FF (8-channels TMT125, multiplexer)*
		4A	*PA (2-channels TMT845, head transmitter DIN B)*
ac --> Junction Box Size, Position		A	*Alu small, direct mounting*
		B	*Alu big, direct mounting*
		C	*Alu small, remote mounting*
		D	*Alu big, remote mounting*

The full detail code is specified in the Manufacturer's documentation.

Annex to certificate:	**IECEx CES 13.0026X Issue No.:1 of 2021-03-10**
Applicant:	**Endress+Hauser Wetzer GmbH+Co.KG**
	Obere Wank 1, 87484 Nesselwang, Germany
Apparatus:	**Modular MultiSens Linear and Multipoint Thermometer iTHERM®,**
	type TMS12 and TM9xx

Identification of the equipment type **TMS12**
The product name defines its own configuration and consists of a main root that defines the whole family
followed by a string of digits that defines the customized characteristics of each selection.
The approved structure for new MultiSens Linear iTHERM® **TMS12** is as follows:
The code of the **TMS12** apparatus can be read with the below options *(complete description of the code option are
detailed in E+H document nr. 10000002914 version 02.01)*.

TMS12-a *b c d e f* **g** *h i j k l m n o* **p** *q r* **s t u** *v w x y* **z aa** *ab ac ad ae af ag ah*

a --> Approval	ID	*IECEx Ex d IIC Gb*
	IE	*IECEx Ex ia IIIC Da/Db*
	IF	*IECEx Ex tb IIIC Da/Db*
	IF	*IECEx Ex tb IIIC Db*
	IJ	*IECEx Ex ia IIC Ga/Gb*
	I7	*IECEx Ex d IIC Ga/Gb, Ex ta/tb IIIC Da/Db*

g --> Number Measurement Points   A *2*, B *3*, C *4*, D *5*, E *6*, F *7*, G *8*, H *9*, I *10*, J *11*, K *12*, Z *Special version*

p --> Sensor Type; Diam.; Material; Meas.Range:Temperature	ZZ	*Special version*
	1C	*TC type K; 3mm; Alloy600; -270...+1070 °C*
	1H	*TC type J; 3mm; 316L; -210...+520 °C*
	1M	*TC type N; 3mm; Pyrosil; -270...+1100 °C*
	2A	*Pt100 TF; 3mm; 316L; -50...+400 °C*
	2C	*Pt100 WW; 3mm; 316L; -200...+600 °C*
	2Q	*1x QuickSens, 3 mm*
	2S	*1x StrongSens, 6 mm*

s --> Housing:	0	*W/o*
	2	*Direct mounted*
	4	*Remote with protecting hose*

t --> Cable entry housing	A *or* E	*NPT1/2*
(Process Side)	B *or* F	*M20x1.5*
	D *or* G	*M25x1.5*
	K	*for flexible hose M32 (DN29)*
	L	*for flexible hose M40 (DN36)*
	M	*for flexible hose M50*
	Z	*Special version, to be spec.*
	0	*Not applicable*

u --> Cable output housing	A *or* E *or* I	*NPT1/2*
(User Side)	B *or* F *or* F	*NPT1*
	C *or* G *or* K	*M20x1.5*
	D *or* H *or* L	*M25x1.5*
	Z	*Special version, to be spec.*
	0	*Not applicable*

z --> Electrical Connection:	AA	*Flying leads*
	GA	*TMT162 HART, temp. range to be spec.*
	GB	*TMT162 FF*
	GC	*TMT162 PA*
	GQ	*TMT182 HART, non-SIL, temp. range to be spec.*
	GR	*TMT182 HART, SIL2, temp. range to be spec.*
	GT	*TMT84*
	GU	*TMT85 FF*
	GZ	*Special version, to be spec.*
	G1	*Terminal block*
	G2	*TMT82 HART, SIL2/3 conformity, temp. range to be spec.*
	G3	*TMT71, 4-20mA, temp. range to be spec.*
	G4	*TMT72, HART, temp. range to be spec.*

aa --> Approval Type Transmitter: F *IECEx*

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Obere Wank 1, 87484 Nesselwang, Germany
Apparatus: **Modular MultiSens Linear and Multipoint Thermometer iTHERM®, type TMS12 and TM9xx**

Electrical characteristics:

The electrical characteristics may vary and depends on the kind of protection type adopted and of the configuration of connection head *(transmitters or terminal blocks)*.

Modular Multipoint Thermometer iTHERM® type **TM9xx** and MultiSens Linear iTHERM® **TMS12**
Protection type Ex d, Ex t

E+H transmitter type	TMT71[1] TMT72[1]	TMT182[1]	TMT84[1] TMT85[1]	TMT82[1]	TMT162[1]
Power supply U_b / V	36	35	35	42	42
max. current / mA	23	23	12	23	23

[1] the transmitter circuits are current limited by electronic - **TMS12** only.

Protection type Ex i
Maximum intrinsically safe **E+H** transmitter's supply

E+H transmitter type	TMT71[1] TMT72[1]	TMT182	TMT84 TMT85	TMT82	TMT162
Ui	30 V	30 V	17.5 V or 24 V	30 V	17.5 V or 24 V
Ii	100 mA	100 mA	380 or 250 mA	130 mA	500 or 250 mA
Pi	800 mW	750 mW	max 1.5 W	800 mW	5.32 or 1.2 W
Li	negligible	negligible	2.75 µH	negligible	10 µF
Ci	negligible	negligible	5 nF	negligible	5 nF

[1] **TMS12** only.

Protection type Ex i
Maximum intrinsically safe output for inserts

E+H transmitter type	TMT71[1] TMT72[1]	TMT182	TMT84 TMT85	TMT82	TMT162
Uo	4.3 V	5 V	7.2 V	7.6 V	7.6 V
Io	4.8 mA	5.4 mA	25.9 mA	13 mA	26.9 mA
Po	5.2 mW	6.6 mW	46.7 mW	24.7 mW	57.6 mW
Lo for IIC	50 mH	100 mH	20 mH	10 mH	40 mH
Co for IIC	3 µF	2 µF	0.97 µF	1 µF	10.5 µF

[1] **TMS12** only.

Input values for single approved inserts or simple apparatus

Maximum intrinsically safe input values for single **approved inserts** *(including connection cable)*

TS111; TS211; TPR100 TPC100; TSC310; TST310				
Ui = 30 V	Ii = 140 mA	Pi = 1 W	Li = 75 µF	Ci = 15 nF

The use of **simple apparatus**, such as thermocouples *(single, double or triple element)* the electrical parameters for each input circuit are:

Ui ≤: 9.8 V; Ii ≤ 30 mA Pi ≤ 0.06 W

For the total inner capacitance Ci and inductance Li for simple apparatus, shall be taken into account the worst-case scenario, regarding the internal capacitance and inductance shall be assessed according to IEC 60079-25

Prot: C1002165

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Applicant: **Endress+Hauser Wetzer GmbH+Co.KG**
 Obere Wank 1, 87484 Nesselwang, Germany
Apparatus: **Modular MultiSens Linear and Multipoint Thermometer iTHERM®,**
 type TMS12 and TM9xx

Temperature - Assembly Temperature ranges :
The ambient temperature of the assembled connection head, depends on the type of protection adopted and the type of configuration *(terminal blocks or transmitters)*.

The iTHERM® TMS12 MultiSens Linear and iTHERM® Modular Multipoint Thermometer type TM9xx have the following ambient temperature ranges:

- The Maximum allowed ambient temperature Ta (ambient temperature) of the **connection head** assembled with **only terminal blocks** is from -50°C up to +110°C.
- The Maximum allowed ambient temperature Ta (ambient temperature) of the **connection head** fully assembled with **transmitters** is from -50°C up to +85°C.

The iTHERM® TMS12 MultiSens Linear and iTHERM® Modular Multipoint Thermometer type TM9xx have the following process temperature ranges:

Maximum allowed process temperature Tp (process):

- -50°C ÷ +440°C (for TC construction)
- -50°C ÷ +426°C (for RTD construction)

TM9xx and **TMS12** - Assembles with **terminal blocks**; type of protection "i" EPL Ga and "d" EPL Gb; "t" EPL Db
The max range of the operative temperature of the connection head, assembled with only underline terminal blocks, is from -50 up to +110 °C with the limitations of a few special cases identified in the Manufacturer's documentations.

Assembly with temperature Transmitter - Product TM9xx and TMS12

The range of the ambient temperature of the connection head, assembled with different type and numbers of transmitters, is listed in the Manufacturer's documentations that summarise the max ambient temperatures depending on the type, numbers of transmitters installed and service temperature.
- Maximum ambient temperature of the connection head for; **EPL Gb** (identified in the Manufacturer's documentations).

Assembly Temperature ranges Product TMS12
- Maximum ambient temperature of the connection head assembled in Ex d enclosure; **EPL Gb, Db** (identified in the Manufacturer's documentations).

Assembly Temperature ranges Product TMS12:
- Maximum ambient temperature of the connection head assembled in Ex d or EX e enclosure; **EPL Ga** – type of protection Ex ia (identified in the Manufacturer's documentations).

The manufacturer, based on the type of protection adopted and the type of configuration *(terminal blocks or transmitters)*, shall establish and place on the nameplate the assigned values for the ambient temperature and the temperature Class / Surface Temperature of the equipment.