



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 EPS 18.0074X**

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Certificate history:

Status: **Current**

Issue No: 5

Issue 4 (2023-05-30)

Issue 3 (2022-11-24)

Issue 2 (2022-01-09)

Issue 1 (2021-03-11)

Issue 0 (2019-03-28)

Date of Issue: **2023-11-03**

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

Equipment: **Insert iTHERM type TSx1x, Thermometer iTHERM type TM1xx**

Optional accessory: **Type TS111, TS211, T212; Type TM111, TM131, TM112, TM151, TM152**

Type of Protection: **Intrinsic safety "ia"**

Marking: **Ex ia IIC T6...T1 Ga**

Ex ia IIC T6...T1 Ga/Gb

Ex ia IIIC T20085°C...T200450°C Da/Db

Approved for issue on behalf of the IECEx
Certification Body:

Position:

Signature:
(for printed version)

Date:
(for printed version)



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Certificate issued by:

Bureau Veritas Consumer Products Services Germany GmbH
Businesspark A96
86842 Türkheim
Germany





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

Manufacturing locations:	Endress+Hauser Sicestherm S.r.l. Via Martin Luther King 7, I-20060 Pessano con Bornago (MI) Italy	Endress+Hauser Wetzer (India) Pvt. Ltd. M-171/173, MIDC, Waluj Aurangabad – 431 136 India	Endress+Hauser Wetzer (Suzhou) Co. Ltd. Su-Hong-Zhong-Lu No. 465, 215021 Suzhou-SIP (P.R. China) China
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See following pages for more locations

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 Explosive atmospheres - Part 0: Equipment - General requirements
Edition:7.0

IEC 60079-11:2011 Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
Edition:6.0

IEC 60079-26:2014 Explosive atmospheres – Part 26: Equipment with Equipment Protection Level (EPL) Ga
Edition:3.0

IEC TS 60079-40:2015 Explosive atmospheres - Part 40: Requirements for process sealing between flammable process fluids
Edition:1.0

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 Report:

DE/EPS/ExTR18.0076/05

Quality Assessment Report:

DE/TUN/QAR06.0009/11



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EQUIPMENT:

Equipment and systems covered by this Certificate are as follows:

The Insert for Thermometers iTHERM, type TS111-..., TS211-... and TS212-..., are used to convert the temperature of a process medium into an electrical signal.

The insert is used with a terminal head or field transmitter, made of aluminum, stainless steel or conductive plastic. The terminal head contains either a temperature transmitter or connection terminals for connection of the TRD or TC sensor to an external temperature transmitter.

The Thermometers iTHERM type TM111, TM112, TM131, TM151 and TM152 consist of RTD or Thermocouple insert iTHERM, type TS111-..., TS211-... and TS212-... and a terminal head or field transmitter with a thermowell.

The sensor is a single or dual Pt100 resistance element (wire wound or thin film) or a thermocouple element, mounted in a stem with a diameter of 3 mm or 6 mm and a length depending on the application.

The sensor can be used in a 3- or a 4-wire measurement system or in a dual 2- or 3-wire measurement system if a dual temperature sensor element is mounted.

The terminal head or field transmitter, including the cable entry devices provides a degree of protection of at least IP2X in accordance with IEC 60529 for application in explosive gas atmospheres.

The terminal head or field transmitter, including the cable entry devices provides a degree of protection of at least IP6X in accordance with IEC 60079-0 and IEC 60529 for application in explosive dust atmospheres.

The equipment is intended for the application inside the explosive hazardous area.

SPECIFIC CONDITIONS OF USE: YES as shown below:

From the safety point of view, the circuit of versions of the following temperature sensors and inserts shall be considered to be connected to ground (for details, the instruction manual, provided with the equipment, shall be observed):

- Type TS111, TS211 and TS212 with diameter 3mm or 1/8", single or dual
- Type TS111, TS211 and TS212 with diameter 6mm or 1/4" dual

The thermometer must be installed so, that even in the event of rare incidents, an ignition source due to impact friction between the enclosure and iron/steel is excluded.

Avoid electrostatic charging of the plastic housing according to IEC 60079-0 7.4.2 e) (do not rub dry).



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DETAILS OF CERTIFICATE CHANGES (for issues 1 and above)

Adding technical specification IEC TS 60079-40.



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Additional manufacturing locations:

Endress+Hauser Wetzer USA INC
2413 Endress Place, Greenwood, IN 46143
United States of America

Annex:

[IECEX EPS 18.0074X_5 - Annex.pdf](#)



Annex to IECEx Certificate of Conformity

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Applicant:

Endress+Hauser Wetzer GmbH + Co. KG
Obere Wank 1
87484 Nesselwang
Germany

Electrical Apparatus:

Insert iTHERM type TS111, TS211, TS212,
Thermometer iTHERM type TM111, TM131, TM112, TM151, TM152

Description:

Electrical data:

In type of protection intrinsic safety Ex ia IIC and Ex ia IIIC, only for connection to a certified intrinsically safe circuit, with the following maximum values:

Transmitter	Ui	Ii	Pi	Ci	Li
TMT71/TMT72	30 V	100 mA	800 mW	0	0
TMT82	30 V	130 mA	800 mW	0	0
TMT142 HART	30 V	300 mA	1000 mW	5 nF	0
TMT162 HART	30 V	300 mA	1000 mW	0	0
TMT162 PA/FF	FISCO field device				
TMT84, TMT85	FISCO field device				
TMT86	FISCO field device				
Terminal block	30 V	140 mA	1000 mW	See tables below	
Flying leads	30 V	140 mA	1000 mW	See tables below	

Ci and Li, for types TS111/ TS211 and TS212:

Sensor type	Insertion Length IL		Flying leads		Terminal block	
	Ci/m	Li/m	Ci	Li	Ci	Li
Single	200 pF	1 µH	56.4 pF	282 nH	4.6 pF	23 nH
Dual	400 pF	2 µH	113 pF	564 nH	9.2 pF	46 nH

Calculation formula for options with flying leads and terminal block only:

$$C_i = C_{i \text{ Insertion length IL}} \times IL + C_{i \text{ Flying leads}}$$

$$L_i = L_{i \text{ Insertion length IL}} \times IL + L_{i \text{ Flying leads}}$$

$$C_i = C_{i \text{ Insertion length IL}} \times IL + C_{i \text{ Terminal block}}$$

$$L_i = L_{i \text{ Insertion length IL}} \times IL + L_{i \text{ Terminal block}}$$

Thermal data:

The dependency of the ambient and process temperatures upon the temperature class for assembly with transmitters:

Type	Assembled transmitter	Temperature class	Ambient temperature range housing Ta	Maximum surface temperature housing
TM111,	TMT84, TMT85	T6	$-40^{\circ}\text{C} \leq T_a \leq +55^{\circ}\text{C}$	T85°C
TM112,	TMT162 PA/FF	T5	$-40^{\circ}\text{C} \leq T_a \leq +70^{\circ}\text{C}$	T100°C
TM131,		T4	$-40^{\circ}\text{C} \leq T_a \leq +85^{\circ}\text{C}$	T135°C
TM151,	TMT71, TMT72, TMT86 ¹	T6	$-50^{\circ}\text{C} \leq T_a \leq +55^{\circ}\text{C}$	T85°C
TM152,	TMT162 HART	T5	$-50^{\circ}\text{C} \leq T_a \leq +70^{\circ}\text{C}$	T100°C
TS111,	TMT142 HART	T4	$-50^{\circ}\text{C} \leq T_a \leq +85^{\circ}\text{C}$	T135°C
TS211,	TMT82 ¹	T6	$-50^{\circ}\text{C} \leq T_a \leq +58^{\circ}\text{C}$	T85°C
TS212		T5	$-50^{\circ}\text{C} \leq T_a \leq +75^{\circ}\text{C}$	T100°C
		T4	$-50^{\circ}\text{C} \leq T_a \leq +85^{\circ}\text{C}$	T135°C
	TMT8x, TMT7x	T6	$-40^{\circ}\text{C} \leq T_a \leq +55^{\circ}\text{C}$	T85°C
	with display	T5	$-40^{\circ}\text{C} \leq T_a \leq +70^{\circ}\text{C}$	T100°C
		T4	$-40^{\circ}\text{C} \leq T_a \leq +85^{\circ}\text{C}$	T135°C

¹ Lower temperature of -52°C for TMT82 only with gas Ex ia IIC Ga/Gb and only without display.

Type	Assembled transmitter	Insert diameter	Process temperature range Tp	Temperature class/ Maximum surface temperature sensor
TM111,	TMT8x,	3mm (1/8"),	$-50^{\circ}\text{C} \leq T_p \leq +66^{\circ}\text{C}$	T6 / T85°C
TM112,	TMT7x	3mm (1/8")	$-50^{\circ}\text{C} \leq T_p \leq +81^{\circ}\text{C}$	T5 / T100°C
TM131,	TMT142	dual,	$-50^{\circ}\text{C} \leq T_p \leq +116^{\circ}\text{C}$	T4 / T135°C
TM151,		6mm (1/4")	$-50^{\circ}\text{C} \leq T_p \leq +181^{\circ}\text{C}$	T3 / T200°C
TM152,		dual	$-50^{\circ}\text{C} \leq T_p \leq +276^{\circ}\text{C}$	T2 / T300°C
TS111,			$-50^{\circ}\text{C} \leq T_p \leq +426^{\circ}\text{C}$	T1 / T450°C
TS211,		6mm (1/4")	$-50^{\circ}\text{C} \leq T_p \leq +73^{\circ}\text{C}$	T6 / T85°C
TS212			$-50^{\circ}\text{C} \leq T_p \leq +88^{\circ}\text{C}$	T5 / T100°C
			$-50^{\circ}\text{C} \leq T_p \leq +123^{\circ}\text{C}$	T4 / T135°C
			$-50^{\circ}\text{C} \leq T_p \leq +188^{\circ}\text{C}$	T3 / T200°C
			$-50^{\circ}\text{C} \leq T_p \leq +283^{\circ}\text{C}$	T2 / T300°C
			$-50^{\circ}\text{C} \leq T_p \leq +433^{\circ}\text{C}$	T1 / T450°C



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Type	Assembled transmitter	Insert diameter	Process temperature range T_p	Temperature class/ Maximum surface temperature sensor
TM131, TM151, TM152, TS211, TS212	TMT162	3mm (1/8"), 3mm (1/8") dual, 6mm (1/4") dual	$-50^{\circ}\text{C} \leq T_p \leq +64^{\circ}\text{C}$	T6 / T85°C
			$-50^{\circ}\text{C} \leq T_p \leq +79^{\circ}\text{C}$	T5 / T100°C
			$-50^{\circ}\text{C} \leq T_p \leq +114^{\circ}\text{C}$	T4 / T135°C
			$-50^{\circ}\text{C} \leq T_p \leq +179^{\circ}\text{C}$	T3 / T200°C
			$-50^{\circ}\text{C} \leq T_p \leq +279^{\circ}\text{C}$	T2 / T300°C
			$-50^{\circ}\text{C} \leq T_p \leq +424^{\circ}\text{C}$	T1 / T450°C
		6mm (1/4")	$-50^{\circ}\text{C} \leq T_p \leq +71^{\circ}\text{C}$	T6 / T85°C
			$-50^{\circ}\text{C} \leq T_p \leq +86^{\circ}\text{C}$	T5 / T100°C
			$-50^{\circ}\text{C} \leq T_p \leq +121^{\circ}\text{C}$	T4 / T135°C
			$-50^{\circ}\text{C} \leq T_p \leq +186^{\circ}\text{C}$	T3 / T200°C
			$-50^{\circ}\text{C} \leq T_p \leq +286^{\circ}\text{C}$	T2 / T300°C
			$-50^{\circ}\text{C} \leq T_p \leq +431^{\circ}\text{C}$	T1 / T450°C

The dependency of the ambient and process temperatures upon the temperature class for assembly without transmitter (terminal block or flying leads):

Type	Insert diameter	Temperature class/ Maximum surface temperature	Maximum allowed process temperature (sensor)				
			Tp (process)				
			Pi ≤ 50 mW	Pi ≤ 100 mW	Pi ≤ 200 mW	Pi ≤ 500 mW	Pi ≤ 650 mW
TS111, TS211, TS212	3mm (1/8"), 3mm (1/8") dual or 6mm (1/4") dual	T1 / T450°C	426°C	415°C	396°C	343°C	333°C
		T2 / T300°C	276°C	265°C	246°C	193°C	183°C
		T3 / T200°C	181°C	170°C	151°C	98°C	88°C
		T4 / T135°C	116°C	105°C	86°C	33°C	23°C
		T5 / T100°C	81°C	70°C	51°C	-2°C	-12°C
		T6 / T85°C	66°C	55°C	36°C	-17°C	-27°C
	6mm (1/4")	T1 / T450°C	433°C	428°C	420°C	398°C	388°C
		T2 / T300°C	283°C	278°C	270°C	248°C	238°C
		T3 / T200°C	188°C	183°C	175°C	153°C	143°C
		T4 / T135°C	123°C	118°C	110°C	88°C	78°C
		T5 / T100°C	88°C	83°C	75°C	53°C	43°C
		T6 / T85°C	73°C	68°C	60°C	38°C	28°C

Type	Insert diameter	Temperature class/ Maximum surface temperature	Maximum allowed process temperature (sensor) Tp (process)			Ambient temperature (housing), Ta (ambient)*
			Pi ≤ 750 mW	Pi ≤ 800 mW	Pi ≤ 1000 mW	
TS111, TS211, TS212	3mm (1/8"), 3mm (1/8") (dual) or 6mm (1/4") dual	T1 / T450°C	320°C	312°C	280°C	-40°C ≤ Ta ≤ +130°C
		T2 / T300°C	170°C	162°C	130°C	-40°C ≤ Ta ≤ +130°C
		T3 / T200°C	75°C	62°C	30°C	-40°C ≤ Ta ≤ +130°C
		T4 / T135°C	10°C	2°C	-30°C	-40°C ≤ Ta ≤ +116°C
		T5 / T100°C	-25°C	-33°C	---	-40°C ≤ Ta ≤ +81°C
		T6 / T85°C	-40°C	---	---	-40°C ≤ Ta ≤ +66°C
	6mm (1/4")	T1 / T450°C	381°C	377°C	361°C	-40°C ≤ Ta ≤ +130°C
		T2 / T300°C	231°C	227°C	211°C	-40°C ≤ Ta ≤ +130°C
		T3 / T200°C	136°C	127°C	111°C	-40°C ≤ Ta ≤ +130°C
		T4 / T135°C	71°C	67°C	51°C	-40°C ≤ Ta ≤ +123°C
		T5 / T100°C	36°C	32°C	16°C	-40°C ≤ Ta ≤ +88°C
		T6 / T85°C	21°C	17°C	1°C	-40°C ≤ Ta ≤ +73°C

* The ambient temperature at the terminal head may be directly influenced by the process temperature, but is restricted to the range -40° C ... +130°C, besides for types TA30A, TA30D and TA30H and sensor, type TS111, TS211 or TS212, with a restricted range -50°C ... +130°C.
The lower temperature of -60°C is only possible with the marking Ex ia IIC Ga/Gb.

For thermometers with two mounted head transmitters the allowed ambient temperature is up to 12K lower than each head transmitter's certified ambient temperature.

For thermocouple inserts, the temperature class T6...T1 and the maximum surface temperature T85 °C ... T450°C are equal to the process temperature.