



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** Page 1 of 4 Certificate history:
Status: **Current** Issue No: 2 [Issue 1 \(2021-03-11\)](#)
[Issue 0 \(2019-03-28\)](#)
Date of Issue: 2022-01-09
Applicant: **Endress + Hauser Wetzler GmbH & Co. KG**
Obere Wank 1
87484 Nesselwang
Germany
Equipment: **Insert iTHERM type TSx11, Thermometer iTHERM type TM1x1**
Optional accessory: Type TS111, TS211; Type TM111, TM131
Type of Protection: **ia**
Marking: Ex ia IIC T6...T1 Ga
Ex ia IIC T6...T1 Ga/Gb
Ex ia IIIC T85°C...T450°C Da/Db

Approved for issue on behalf of the IECEx
Certification Body:

Ulrich Feike

Position:

Certification Manager

Signature:
(for printed version)

Date:

2022-01-09

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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

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

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 60079-26:2014-10](#) Explosive atmospheres – Part 26: Equipment with Equipment Protection Level (EPL) Ga
Edition:3.0

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 Reports:

[DE/EPS/ExTR18.0076/01](#)

[DE/EPS/ExTR18.0076/02](#)

Quality Assessment Report:

[DE/TUN/QAR06.0009/09](#)



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EQUIPMENT:

Equipment and systems covered by this Certificate are as follows:

The Insert for Thermometers iTHERM, type TS111-... and TS211-... 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 and Type TM131 consist of RTD or Thermocouple insert iTHERM, type TS111-... and TS211-... 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, TS212 with a diameter 3mm, single or dual
- Type TS111, TS212 with diameter 6mm 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)

Description of changes in revision 2:

- Adding of terminal head, type TA20B
- Adding of Terminal head, type TA30R without display, classified for use in group IIIC

Annex:

[IECEX EPS 18.0074X - Annex 02.pdf](#)



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	U _i	i _i	P _i	C _i	L _i
TMT71/TMT72	30 V	100 mA	800 mW	0	0
TMT82	30 V	130 mA	800 mW	0	0
TMT142 HART	30V	300 mA	1000 mW	5 nF	0
TMT162 HART	30 V	300 mA	1000 mW	0	0
TMT162 PA/FF	FISCO field devices				
TMT84, TMT85	FISCO field devices				
Terminal block	30 V	140 mA	1000 mW	See tables below	
Flying leads	30 V	140 mA	1000 mW	See tables below	

C_i and L_i, for types TS111/ TS211:

Sensor type	Insertion Length IL		Flying leads		Terminal block	
	C _i /m	L _i /m	C _i	L _i	C _i	L _i
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, TM131, TS111, TS211	TMT84, TMT85 TMT162 PA/FF	T6	-40°C ≤ Ta ≤ +55°C	T85°C
		T5	-40°C ≤ Ta ≤ +70°C	T100°C
		T4	-40°C ≤ Ta ≤ +85°C	T135°C
TS211	TMT71, TMT72 TMT162 HART TMT142 HART	T6	-50°C ≤ Ta ≤ +55°C	T85°C
		T5	-50°C ≤ Ta ≤ +70°C	T100°C
		T4	-50°C ≤ Ta ≤ +85°C	T135°C
	TMT82 ¹	T6	-50°C ≤ Ta ≤ +58°C	T85°C
		T5	-50°C ≤ Ta ≤ +75°C	T100°C
		T4	-50°C ≤ Ta ≤ +85°C	T135°C
TMT8x, TMT7x with display	T6	-40°C ≤ Ta ≤ +55°C	T85°C	
	T5	-40°C ≤ Ta ≤ +70°C	T100°C	
	T4	-40°C ≤ Ta ≤ +85°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, TM131, TS111, TS211	TMT8x, TMT7x TMT142	3mm, 3mm(dual), 6mm dual	-50°C ≤ Tp ≤ +66°C	T6 / T85°C
			-50°C ≤ Tp ≤ +81°C	T5 / T100°C
			-50°C ≤ Tp ≤ +116°C	T4 / T135°C
			-50°C ≤ Tp ≤ +181°C	T3 / T200°C
			-50°C ≤ Tp ≤ +276°C	T2 / T300°C
			-50°C ≤ Tp ≤ +426°C	T1 / T450°C
		6mm	-50°C ≤ Tp ≤ +73°C	T6 / T85°C
			-50°C ≤ Tp ≤ +88°C	T5 / T100°C
			-50°C ≤ Tp ≤ +123°C	T4 / T135°C
			-50°C ≤ Tp ≤ +188°C	T3 / T200°C
			-50°C ≤ Tp ≤ +283°C	T2 / T300°C
			-50°C ≤ Tp ≤ +433°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, TS211	TMT162	3mm, 3mm(dual), 6mm 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	$-50^{\circ}\text{C} \leq T_p \leq +71^{\circ}\text{C}$	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	3mm, 3mm (dual) or 6mm 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	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	3mm, 3mm (dual) or 6mm 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	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 or TS211, 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.



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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.