



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 DEK 12.0049X

Issue No: 1

Certificate history:

Status: **Current**

[Issue No. 1 \(2018-11-29\)](#)

[Issue No. 0 \(2012-09-25\)](#)

Date of Issue: **2018-11-29**

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

Equipment: **RTD and TC temperature sensors and thermometers; see Annex 1**

Optional accessory:

Type of Protection: **Ex ia**

Marking:
Ex ia IIC T6...T1 Ga
Ex ia IIC T6...T1 Ga/Gb
Ex ia IIIC T85 °C...T450 °C Da
Ex ia IIIC T85 °C...T450 °C Da/Db

*Approved for issue on behalf of the IECEx
Certification Body:*

R. Schuller

Position:

Certification Manager

*Signature:
(for printed version)*

Date:

2018-11-29

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:

DEKRA Certification B.V.
Meander 1051,
6825 MJ Arnhem
The Netherlands





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

Additional Manufacturing location(s):

Additional Manufacturing Locations are included in Annex 2

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 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 Explosive atmospheres - Part 0: General requirements
Edition:6.0

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 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:

[NL/DEK/ExTR12.0058/01](#)

Quality Assessment Report:

[DE/TUN/QAR06.0009/07](#)

[IT/CES/QAR10.0001/07](#)



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Schedule

EQUIPMENT:

Equipment and systems covered by this certificate are as follows:

RTD-Thermometers, Type TR,-,...,
Thermocouple-Thermometers, Type TC,-,... and TEC420
RTD Inserts, Type TPR100 and iTHERM, Type TS111
Thermocouple Inserts, Type TPC100
Cable sensor, Type TSC310 and TST310
RTD and Thermocouple Sensors iTHERM, Type TM211
Temperature Assembly iTHERM Type TM41,-...

For details refer to Annex 1 to this certificate.

SPECIFIC CONDITIONS OF USE: YES as shown below:

If the mounting head of the Temperature Sensor is made of aluminium and if it is mounted in an area where the use of apparatus of Equipment Protection Level Ga is required, the head must be installed such, that, even in the event of rare incidents, ignition sources due to impact and friction sparks are excluded.

For Temperature Sensors Type TST310-..., TSC310-... and TM211, if intended for use in explosive gas atmospheres where the use of apparatus of Equipment Protection Level Ga is required, electrostatic charges on the cable shall be avoided.



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

1. Changes in nomenclature and features
2. Assessed per 60079-26 Ed. 3
3. Minor constructional changes.

Annex:

[223137300-Annex1.pdf](#)

[223137300-Annex2.pdf](#)

Annex 1 to: Certificate of Conformity IECEx DEK 12.0049X
EU-Type Examination Certificate DEKRA 12ATEX0161 X, Issue 2
Report NL/DEK/ExTR12.0058/01

Description

The Insert for RTD Thermometers, Type TPR100-... and iTHERM Type TS111-..., the Insert for Thermocouple Thermometers, Type TPC100-..., the Cable Thermometer, Type TST310-... and Type TSC310-... and the RTD or Thermocouple Temperature Sensors, iTHERM Type TM211 are used to convert the temperature of a process medium into an electrical signal.

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

The Temperature Sensors Type TR..-..., Type TC..-... and Type TEC420 and iTHERM Type TM411 and Type TM412 consist of RTD or Thermocouple insert Type TPR100-..., Type TPC100-... or Type TS111 and a mounting head 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 wire or 3 wire measurement system if a dual temperature sensor element is mounted.

The mounting head, including the cable entry device provides a degree of protection of at least IP2X in accordance with IEC 60529 for application in explosive gas atmospheres.

The mounting head, including the cable entry device provides a degree of protection of at least IP6X in accordance with IEC 60529 for application in explosive dust atmospheres.

Thermal data

For each dual or single element, the temperature class T6...T1 and the maximum surface temperature T85 °C...T450 °C is depending on the process temperature and the Supply/output circuit power P_i , in accordance with the following tables:

Insert diameter	Temperature class/max temperature T	$P_i \leq 50 \text{ mW}$	$P_i \leq 100 \text{ mW}$	$P_i \leq 200 \text{ mW}$	$P_i \leq 500 \text{ mW}$
		Max. allowed process temperature [°C]			
3 mm, 3 mm (dual) or 6 mm (dual)	T1/450 °C	426	415	396	343
	T2/300 °C	276	265	246	193
	T3/200 °C	181	170	151	98
	T4/135 °C	116	105	86	33
	T5/ 95 °C	81	70	51	-2
	T6/ 85 °C	66	55	36	-17
6 mm	T1/450 °C	433	428	420	398
	T2/300 °C	283	278	270	248
	T3/200 °C	188	183	175	153
	T4/135 °C	123	118	110	88
	T5/ 95 °C	88	83	75	53
	T6/ 85 °C	73	68	60	38

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Insert diameter	Temperature class	$P_i \leq 650 \text{ mW}$	$P_i \leq 750 \text{ mW}$	$P_i \leq 800 \text{ mW}$	$P_i \leq 1000 \text{ mW}$
		Max. allowed process temperature [°C]			
3 mm, 3 mm (dual) or 6 mm (dual)	T1/450 °C	333	320	312	280
	T2/300 °C	183	170	162	130
	T3/200 °C	88	75	62	30
	T4/135 °C	23	10	2	-30
	T5/ 95 °C	-12	-25	-33	
	T6/ 85 °C	-27	-40		
6 mm	T1/450 °C	388	381	377	361
	T2/300 °C	238	231	227	211
	T3/200 °C	143	136	127	111
	T4/135 °C	78	71	67	51
	T5/ 95 °C	43	36	32	16
	T6/ 85 °C	28	21	17	1

The ambient temperature at the mounting head may be directly influenced by the process temperature, but is restricted to the range -40 °C ... +130 °C, or by the specifications of the applied integral temperature transmitter and the optional display, if appropriate.

For thermometers with two mounted head transmitters the allowed ambient temperature is 10K 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.

For further details regarding the temperature classification respectively the maximum surface temperature and the maximum process and ambient temperatures, allowed for the different versions and in relation to the maximum input power P_i , refer to the instruction manual.

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Electrical data

Supply/output circuit:

for insert options with terminal block, flying leads or thermometer, all types:

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:

$U_i = 30 \text{ V}$; $I_i = 140 \text{ mA}$; $P_i = 1 \text{ W}$.

C_i and L_i , for types TS111/TPx100:

Sensor type	Insertion Length IL		Flying leads		Terminal block	
	C_i [F/m]	L_i [H/m]	C_i [F]	L_i [H]	C_i [F]	L_i [H]
Single	2,00E-10	1,00E-06	1,96E-11	9,80E-08	4,60E-12	2,30E-08
Dual	4,00E-10	2,00E-06	3,92E-11	1,96E-07	9,20E-12	4,60E-08

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

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

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

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

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

C_i and L_i , for types TSx310:

Sensor type	Insertion Length NL		Connection		Length Extension L	
	C_i [F/m]	L_i [H/m]	C_i [F]	L_i [H]	C_i [F/m]	L_i [H/m]
Single	2,00E-10	1,00E-06	2,50E-11	1,25E-07	2,00E-10	1,00E-06
Dual	4,00E-10	2,00E-06	5,00E-11	2,50E-07	4,00E-10	2,00E-06

Calculation formula for cable thermometer:

$$C_i = C_{i \text{ Sensor length NL}} \times NL + C_{i \text{ connection}} + C_{i \text{ Cable L}} \times L$$

$$L_i = L_{i \text{ Sensor length NL}} \times NL + L_{i \text{ connection}} + L_{i \text{ Cable L}} \times L$$

Refer to the tables above for the relation between P_i and the maximum process temperature, the temperature class and the maximum surface temperature.

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 TPC100-..., with diameter 3 mm, single or dual
- Type TSC310-..., with diameter 1.5 mm, 2 mm, 3 mm or 4,5 mm, single or dual
- Type TST310-... and Type TM211, with diameter 3 mm.

For Temperature Sensors with a mounted intrinsically safe Temperature Transmitter, the electrical parameters of the transmitter shall be observed.

Annex 2 to: Certificate of Conformity IECEx DEK 12.0049X

Manufacturing locations:

1. Endress+Hauser Wetzer GmbH+Co. KG
Obere Wank 1
87484 Nesselwang
Germany
2. Endress+Hauser Wetzer (Suzhou) Co. Ltd.
Jiang-Tian-Li-lu No.31
215021 Suzhou-SIP (P.R. China)
China
3. Endress+Hauser Wetzer USA INC
2413 Endress Place
Greenwood, IN 46143
USA
4. Endress+Hauser Wetzer (India) Pvt. Ltd.
M-171/173, MIDC, Waluj
Aurangabad – 431 136
India
5. Endress+Hauser Sicestherm S.r.l.
Via Martin Luther King, 7
I-20060 Pessano con Bornago (MI)
Italy

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

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

C_i and L_i , for types TSx310:

Sensor type	Insertion Length NL		Connection		Length Extension L	
	C_i [F/m]	L_i [H/m]	C_i [F]	L_i [H]	C_i [F/m]	L_i [H/m]
Single	2,00E-10	1,00E-06	2,50E-11	1,25E-07	2,00E-10	1,00E-06
Dual	4,00E-10	2,00E-06	5,00E-11	2,50E-07	4,00E-10	2,00E-06

Calculation formula for cable thermometer:

$$C_i = C_{i \text{ Sensor length NL}} \times NL + C_{i \text{ connection}} + C_{i \text{ Cable L}} \times L$$

$$L_i = L_{i \text{ Sensor length NL}} \times NL + L_{i \text{ connection}} + L_{i \text{ Cable L}} \times L$$

Refer to the tables above for the relation between P_i and the maximum process temperature, the temperature class and the maximum surface temperature.

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):

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- Type TST310-... and Type TM211, with diameter 3 mm.

For Temperature Sensors with a mounted intrinsically safe Temperature Transmitter, the electrical parameters of the transmitter shall be observed.