

# 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](http://www.iecex.com)

Certificate No.: IECEx TUN 10.0002X Issue No: 1 Certificate history:  
Status: **Current** Page 1 of 5 Issue No. 1 (2016-01-19)  
Date of Issue: **2016-01-19** Issue No. 0 (2010-04-09)  
Applicant: **WIKA Alexander Wiegand SE & Co. KG**  
Alexander-Wiegand-Strasse 30  
63911 Klingenberg  
Germany  
Electrical Apparatus: **Thermometer TR... / TC...**  
Optional accessory:  
Type of Protection: **Intrinsic Safety**  
Marking:

### Group II

Ex ia IIC T1...T6 Ga

Ex ia IIC T1...T6 Gb

Ex ia IIC T1...T6 Ga/Gb

Ex ib IIC T1...T6 Gb

Ex ic IIC T1...T6 Gc

### Group III

Ex ia IIIC T65°C/T95°C/T125°C Da

Ex ia IIIC T65°C/T95°C/T125°C Db

Ex ia IIIC T65°C/T95°C/T125°C Da/Db

Ex ib IIIC T65°C/T95°C/T125°C Db

Approved for issue on behalf of the IECEx  
Certification Body:

Andreas Meyer

Position:

Head of IECEx Certification Body

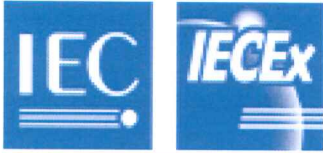
Signature:  
(for printed version)

Date:

  
2016-01-19

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3. The Status and authenticity of this certificate may be verified by visiting the [Official IECEx Website](http://www.iecex.com).

Certificate issued by:



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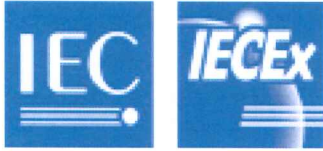
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Germany





# IECEX Certificate of Conformity

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Date of Issue: 2016-01-19 Page 3 of 5  
Manufacturer: **WIKA Alexander Wiegand SE & Co. KG**  
Alexander-Wiegand-Strasse 30  
63911 Klingenberg  
Germany

Additional Manufacturing  
location(s):

WIKA Instrumentation (Suzhou) Co., Ltd.	WIKA Instruments India Pvt. Ltd.	WIKA Instruments (Pty) Ltd	WIKA Alexander Wiegand SE & Co. KG	WIKA Instruments Ltd.	WIKA Instrument Corporation Houston
81.Tayuan Road, SND Suzhou 215011, Jiangsu P.R. China	Plot No. 40, GAT No. 94+ 100 High Cliff Industrial Estate Village – Kesnand Wagholi Pune 412207 India	Chilvers Street, Denver, Johannesburg 2094 South Africa	Alexander-Wiegand- Strasse 30 63911 Klingenberg Germany	3103 Parsons Road, Edmonton, AB T6N 1C8 Canada	950 Hall Court, Deer Park, TX 77536 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 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:

<b>IEC 60079-0 : 2011</b> Edition:6.0	Explosive atmospheres - Part 0: General requirements
<b>IEC 60079-11 : 2011</b> Edition:6.0	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
<b>IEC 60079-26 : 2014-10</b> Edition:3.0	Explosive atmospheres – Part 26: Equipment with Equipment Protection Level (EPL) Ga

*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:

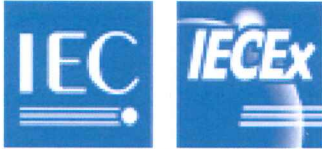
*A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in*

Test Report:

[DE/TUN/ExTR10.0004/00](#) [DE/TUN/ExTR10.0004/01](#)

Quality Assessment Report:

[DE/BVS/QAR07.0010/10](#) [GB/ITS/QAR10.0004/02](#) [NO/DNV/QAR08.0002/04](#)



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## Schedule

### EQUIPMENT:

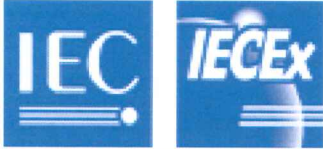
*Equipment and systems covered by this certificate are as follows:*

See attachement

### CONDITIONS OF CERTIFICATION: YES as shown below:

- 1.) Types with  $\varnothing < 3$  mm or „grounded measuring points“ do not comply to clause 6.3.13 of IEC 60079-11 because of the kind of use. By that from a safety-related view this Intrinsically safe circuits shall be considered as galvanically connected to ground potential. Potential equalization shall exist in the complete course of the erection of the intrinsically safe circuits. Furthermore for the connection the requirements of IEC 60079-14 shall be considered.
- 2.) For devices that do not comply to the electrostatic requirements of IEC 60079-0 and IEC 60079-26 due to their construction, electrostatic charging shall be avoided.
- 3.) The used transmitters/digital displays shall be provided with their own EC-Type Examination Certificate in accordance to IEC. The installation conditions, the electrical connection values, the temperature classes resp. the maximum surface temperatures of devices for the use in explosive dust atmospheres and the permissible ambient temperature shall be taken from the corresponding EC-Type Examination Certificate and shall be considered.
- 4.) A reverse heat flow from the process exceeding the permissible ambient temperature of the transmitter, the digital display or the enclosure is not allowed and shall be avoided by a suitable thermal insulation or a suitable neck length of the tubing.
- 5.) In case of a wall thickness less than 1 mm the device may not be exposed to environmental conditions which may negatively affect the partition wall. A thermowell with a suitable minimum wall thickness can be used alternatively.
- 6.) Using a thermowell/neck tube the device shall be constructed in a way that allows an installation hat results in a sufficient tight joint (IP66 or IP67) or a flameproof joint (IEC 60079-1) in the direction of the less endangered area.
- 7.) The circuits of the coaxial multipoint thermocouple shall to be considered as connected due to their construction. For the application a separate examination shall be done resp. for the connection of the coaxial multipoint thermocouple special conditions for safe use must be considered if applicable. An additionally assessment as an intrinsically safe system shall be done (e.g. connection of several circuits of different transmitters etc.).
- 8.) For the use of enclosures they shall either be provided with their own EC-Type Examination Certificate or they shall comply to the minimum requirements. IP-protection: at least IP20 (at least IP6X for dust) applies for all enclosures. Light metal enclosures, however, shall comply with clause 8.3 and 8.4 of IEC 60079-0. Non-metallic enclosures or powder-coated enclosures shall also comply with 7.4 of IEC 60079-0 or have an corresponding warning marking.
- 9.) Accessible parts of metallic enclosures which are not connected to ground and accessible parts of metallic enclosures which are connected to ground but do not comply to clause 6.5 of IEC 60079-11, shall comply with clause 7.5 of IEC 60079-0 or have an corresponding warning marking.
- 10.) In case it is impracticable to include the ambient temperature range within the marking of the device, because the device is a small device according to 29.10 of IEC 60079-0, the ambient temperature range shall be specified in the supplied manual. If the device is not a small device according to 29.10 of IEC 60079-0 and the ambient temperature range is not included within the marking, the marking shall additionally include an advisory marking referring to the supplied manual.





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

Subject of this supplement is the assessment of the thermometer type TR./ TC in accordance with the current standard Versions.

Equipment see attachment to CoC IECEX TUN 10.0002X issue\_1

**Annex:**

[Attachment to CoC IECEX TUN 10.0002X issue\\_1.pdf](#)

For applications without transmitter (digital display) which require devices of the group II (explosive gas atmospheres) the following temperature class classifications and ambient temperature ranges from table 1 apply:

Table 1

Marking	Temperature class	Ambient temperature range ( $T_a$ ) <sup>1</sup>	Maximum surface temperature ( $T_{max}$ ) at the tip of the probe or thermowell
Ex ia IIC T6 Ga or Ex ia IIC T6 Ga/Gb or Ex ia IIC T6 Gb or Ex ib IIC T6 Gb Ex ic IIC T6 Gc	T6	-40 °C to +80 °C -50 °C to +80 °C	T <sub>M</sub> (medium temperature) + self-heating. The special conditions for safe use (17) shall be considered.
Ex ia IIC T5 Ga or Ex ia IIC T5 Ga/Gb or Ex ia IIC T5 Gb or Ex ib IIC T5 Gb Ex ic IIC T5 Gc	T5	-40 °C to +80 °C -50 °C to +95 °C	
Ex ia IIC T4...T1 Ga or Ex ia IIC T4...T1 Ga/Gb or Ex ia IIC T4...T1 Gb or Ex ib IIC T4...T1 Gb Ex ic IIC T4...T1 Gc	T4, T3, T2, T1	-40 °C to +80 °C -50 °C to +100 °C	

<sup>1</sup>Temperature range -40 °C to +80 °C for standard models. Extended temperature ranges are possible for special models. These models are manufactured with special components, i.e. suitable casting compound, enclosures and cable glands for extended temperature ranges.

For applications that require devices of EPL Gb, devices of EPL Ga may also be used. The same electrical parameters as EPL Ga must be applied. If a device of EPL Ga is used in an application requiring EPL Gb it may not be re-used in an application requiring EPL Ga.

For applications that require devices of EPL Gc, devices of EPL Ga or Gb may also be used. The same electrical parameters as EPL Ga or Gb must be applied. If a device of EPL Ga or Gb is used in an application requiring EPL Gc it may not be re-used in an application requiring EPL Ga or Gb.

For the installation of a transmitter and/or a digital display the special conditions for safe use shall be considered.

For applications which require devices of the group III (explosive dust atmospheres) the following surface temperatures, ambient temperature ranges and power dissipation of table 2 apply:

Table 2

Marking	Power $P_i$	Ambient temperature range ( $T_a$ ) <sup>2</sup>	Maximum surface temperature ( $T_{max}$ ) at the tip of the probe or thermowell
Ex ia IIIC T65 °C Da or Ex ia IIIC T65 °C Da/Db or Ex ia IIIC T65 °C Db or Ex ib IIIC T65 °C Db	750 mW	-40 °C to +40 °C -50 °C to +40 °C	T <sub>M</sub> (medium temperature) + self-heating. The special conditions for safe use (17) shall be considered.
Ex ia IIIC T95 °C Da or Ex ia IIIC T95 °C Da/Db or Ex ia IIIC T95 °C Db or Ex ib IIIC T95 °C Db	650 mW	-40 °C to +70 °C -50 °C to +70 °C	
Ex ia IIIC T125 °C Da or Ex ia IIIC T125 °C Da/Db or Ex ia IIIC T125 °C Db or Ex ib IIIC T125 °C Db	550 mW	-40 °C to +80 °C -50 °C to +100 °C	

<sup>2</sup>Temperature range -40 °C to maximum +80 °C for standard models is limited by requirements for group III application. Extended temperature ranges are possible for special models. These models are manufactured with special components, i.e. suitable casting compound, enclosures and cable glands for extended temperature ranges.

For applications that require devices of EPL Db, devices of EPL Da may also be used. The same electrical parameters as EPL Da must be applied. If a device of EPL Da is used in an application requiring EPL Db it may not be re-used in an application requiring EPL Da.

For the installation of a transmitter and/or a digital display the special conditions for safe use shall be considered.

**Parameters:**

**Electrical data without built-in transmitter or digital display**

For devices of group II (explosive gas atmospheres) the following maximum connection values apply:

$$U_i = \text{DC } 30 \text{ V}$$

$$I_i = 550 \text{ mA}$$

$$P_i \text{ (at the sensor}^3\text{)} = 1.5 \text{ W}$$

For devices of group III (explosive dust atmospheres) the following maximum connection values apply:

$$U_i = \text{DC } 30 \text{ V}$$

$$I_i = 550 \text{ mA}$$

$$P_i \text{ (at the sensor}^4\text{)} = \text{Values from table 2, column 2}$$

The internal inductance ( $L_i$ ) and capacitance ( $C_i$ ) of standard measuring inserts according to DIN 43735 are negligibly small. The values for cable probes shall be taken from the type label and shall be considered for the connection to an intrinsically safe power supply.



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Attachment to Issue No. 1 of IECEx TUN 10.0002X

Sensor circuit in type of protection intrinsic safety Ex ia, or ib, IIC  
Only to be connected to intrinsically safe circuits with the following output values for devices of group II (explosive gas atmospheres):

$$U_o = \text{DC } 30 \text{ V}$$
$$I_o = 550 \text{ mA}$$
$$P_o = 1.5 \text{ W}$$

Sensor circuit in type of protection intrinsic safety Ex ia, or ib, IIIC  
Only to be connected to intrinsically safe circuits with the following output values for devices of group III (explosive dust atmospheres):

$$U_o = \text{DC } 30 \text{ V}$$
$$I_o = 550 \text{ mA}$$
$$P_o = \text{Values from table 2, column 2}$$

For the use of multiple sensors and simultaneous operation the summation of all single power dissipation may not exceed the maximum permissible power dissipation. The maximum permissible power shall be limited to 1.5 W, resp. the values of table 2, column 2 shall be considered by the end-user in the end-use application.

<sup>3</sup>The permissible power for the sensor depends on the medium temperature  $T_M$ , the temperature class and the thermal resistance  $R_{th}$ , but not more than 1.5 W.

<sup>4</sup>The permissible power for the sensor depends on the medium temperature  $T_M$ , the maximum permissible surface temperature and the thermal resistance  $R_{th}$ , maximum, however, the values from table 2, column 2.

### Electrical data with built-in transmitter or digital display

For the sensor circuit the above specified values corresponding to the group II resp. group III apply.

Signal circuit in type of protection intrinsic safety Ex ia, or ib, IIC resp. IIIC

$$U_i = \text{depending on transmitter/digital display}$$
$$I_i = \text{depending on transmitter/digital display}$$
$$P_i = \text{inside the enclosure: depending on transmitter/digital display}$$
$$C_i = \text{depending on transmitter/digital display}$$
$$L_i = \text{depending on transmitter/digital display}$$

The used transmitter/ digital display shall be provided with their own EC-Type Examination Certificate in accordance to EN/IEC. The installation conditions and the electrical connection values shall be taken from the corresponding EC-Type Examination Certificate and shall be considered.

### Electrical data with built-in transmitter or digital display according to the FISCO model

The used transmitter/ digital display for operating conditions according to the FISCO model are considered as FISCO field devices. The requirements according to EN/IEC 60079-11 and the conditions for connection of the EC-Type Examination Certificate for FISCO apply.

### Multipoint thermometers



### Multipoints built up from several shell elements

For the isolated single element the above specified values are valid. For elements which are considered as grounded due to their construction the specified values apply for the sensors in sum. For use in dust atmospheres the values of table 2, column 2 apply.

### Coaxial multi-point thermocouples

The circuits of the coaxial element shall be considered as connected due to their construction. For the application a separate examination shall be done resp. for the connection of the coaxial multi-point thermocouple special conditions for safe use shall be considered if applicable. An additionally assessment as an intrinsically safe system shall be done (e.g. connection of several circuits of different transmitters etc.).

Table 3: Thermal resistance [ $R_{th}$  in K/W]

Diameter of the sensor	2.0 mm - < 3.0 mm	3.0 mm - < 6.0 mm	6 mm - 8 mm	3.0 mm <sup>5</sup> - 6.0 mm <sup>5</sup>	0.5 mm - < 1.5 mm	1.5 mm - < 3.0 mm	3.0 mm - < 6.0 mm	6.0 mm - 12.0 mm
Sensor	RTD	RTD	RTD	RTD	TC	TC	TC	TC
Without thermowell	245	110	75	225	105	60	20	5
With thermowell - Fabricated (straigh and tapered) (e.g. TW22, TW35, TW40, TW45 etc..)	135	60	37	/	/	/	11	2.5
With thermowell – bar stock (straight and tapered) (e. g. TW10, TW15, TW20, TW25, TW30, TW50, TW55, TW60 etc.)	50	22	16	/	/	/	4	1
Special designed thermowell - EN 14597	/	/	33	/	/	/	/	2.5
Tx55 (support tube)	/	110	75	225	/	/	20	5
Fitted in a blind hole (minimum wall thickness 5 mm)	50	22	16	45	22	13	4	1

<sup>5</sup> Surface sensitivity

### Application in methane atmospheres

Due to the higher minimum ignition energy of methane, the devices may also used into thereby caused explosive gas atmospheres. The device is optionally marked with IIC + CH<sub>4</sub>.