



(1) **EU-TYPE-EXAMINATION CERTIFICATE**
(Translation)

(2) Equipment or Protective Systems Intended for Use in
Potentially Explosive Atmospheres - **Directive 2014/34/EU**

(3) EU-Type Examination Certificate Number:

PTB 05 ATEX 2017 X

Issue: 01

(4) Product: Temperature measuring transducer, types TTH300-*1..., TTH200-*1...,
TTF300-*1..., TTF200-*1... and TTR200-*1...

(5) Manufacturer: ABB Automation Products GmbH

(6) Address: Schillerstraße 72, 32425 Minden, Germany

(7) This product and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

(8) The Physikalisch-Technische Bundesanstalt, notified body No. 0102 in accordance with Article 17 of the Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014, certifies that this product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres, given in Annex II to the Directive.

The examination and test results are recorded in the confidential Test Report PTB Ex 17-26148.

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN 60079-0:2012 + A11:2013

EN 60079-11:2012

(10) If the sign "X" is placed after the certificate number, it indicates that the product is subject to the Specific Conditions of Use specified in the schedule to this certificate.

(11) This EU-Type Examination Certificate relates only to the design and construction of the specified product in accordance to the Directive 2014/34/EU. Further requirements of the Directive apply to the manufacturing process and supply of this product. These are not covered by this certificate.

(12) The marking of the product shall include the following:

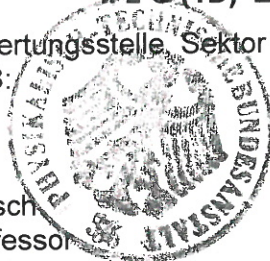
 **II 1 G Ex ia IIC T6 Ga or**
II 2 (1) G Ex [ia IIC Ga] ib IIC T6 Gb or
II 2 G (1D) Ex [ia IIC Da] ib IIC T6 Gb

Konformitätsbewertungsstelle Sektor Explosionsschutz

Braunschweig, November 15, 2017

On behalf of PTB:

Dr.-Ing. F. Lienesch
Direktor und Professor



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EU-Type Examination Certificates without signature and official stamp shall not be valid. The certificates may be circulated only without alteration. Extracts or alterations are subject to approval by the Physikalisch-Technische Bundesanstalt. In case of dispute, the German text shall prevail.

SCHEDULE TO EU-TYPE EXAMINATION CERTIFICATE PTB 05 ATEX 2017 X, Issue: 01

(13)

SCHEDULE

(14) EU-Type Examination Certificate Number PTB 05 ATEX 2017 X, Issue: 01

(15) Description of Product

The temperature measuring transducers of types TTH300-*1..., TTH200-*1..., TTF300-*1..., TTF200-*1... and TTR200-*1... are used in combination with sensors for the detection, amplification and transmission of measured values in intrinsically safe circuits. Resistance thermometers, thermo-couples or other sensors with defined resistance or direct voltage quantities may be connected alternatively to the input.

The modifications concern the extension of the EU-Type Examination Certificate to the temperature measuring transducer of type TTH200-*1 *.H (installation of the temperature measuring transducers of type TTH200-*1H.. into various single-chamber enclosures with / without indicator).

In the future the temperature measuring transducers of types TTF 350-*1..., TTR 300-*1 H.. as well as TTR 200-*1 H2.. are no longer subject matter of this EU-Type Examination Certificate. These types of temperature measuring transducers are no longer manufactured.

Furthermore the modifications include the introduction of a new **HW-Rev. 1.15** for temperature measuring transducer, type TTH 200-*1H.. .

Position 8 of the type code has been changed. A distinction between ATEX- and IECEx-version of the temperature measuring transducer does no longer exist.

Subject matter of this EU-Type Examination Certificate PTB 05 ATEX 2017 X, issue: 01 is also the adaption to the current state of the standards.

Hence, the EU-Type Examination Certificate comprises the temperature measuring transducers according to the following **type code**:

- TTH 300-*1H.. : temperature measuring transducer TTH 300-..., analog HART, Ex-variant two-channel, with HW-Rev. 1.06 and 1.07
- TTH 200-*1H.. : temperature measuring transducer TTH 200-..., analog HART, Ex-variant single-channel, with HW-Rev. 1.06, 1.07, 1.12 and 1.15
- TTR 200-*1 H.. : Electronics system of TTH 200-*1H.. encapsulated in rail-mounting enclosure
- TTF 200-*1 A.H : TTH 200-*1H.. in single-chamber enclosure (AGLF)/ without indicator
- TTF 200-*1 B.H : TTH 200-*1H.. in single-chamber enclosure (AGSF)/ without indicator
- TTF 200-*1 E.H : TTH 200-*1H.. in single-chamber enclosure (AGLFD)/ with LCD-display HMI BS
- TTF 200-*1 F.H : TTH 200-*1H.. in single-chamber enclosure (AGSFD)/ with LCD-display HMI BS
- TTF 300-*1 A.H : TTH 300-*1H.. in single-chamber enclosure (AGLF)/ without indicator
- TTF 300-*1 B.H : TTH 300-*1H.. in single-chamber enclosure (AGSF)/ without indicator
- TTF 300-*1 C.H : TTH 300-*1H.. in single-chamber enclosure (AGLFD)/ with LCD-display HMI B

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TTF 300-*1 D.H : TTH 300-*1H.. in single-chamber enclosure (AGSFD)/ with LCD-display HMI B

Electrical data

The permissible range of the ambient temperature depends on the temperature class and the respective equipment protection levels as specified in the following table:

| Temperature class | T6 | T6 | T4 | T4 |
|--|-----------------|-----------------|-----------------|-----------------|
| Temperature measuring transducer, type | TT*300-*1... | TT*200-*1... | TT*300-*1... | TT*200-*1... |
| Ambient temperature range, EPL Ga | -50 °C...+44 °C | -40 °C...+44 °C | -50 °C...+60 °C | -40 °C...+60 °C |
| Ambient temperature range, EPL Gb | -50 °C...+56 °C | -40 °C...+56 °C | -50 °C...+85 °C | -40 °C...+85 °C |

Temperature measuring transducer: TT*200-*1...

Supply circuit type of protection Intrinsic Safety Ex ia IIB / IIC
(terminals „+“ and „-“ or „+“, „11“, „-“)
or „+“, „11“, „-“)
for connection to certified intrinsically safe circuits

maximum input values:

$U_i = 30 \text{ V}$
 $I_i = 130 \text{ mA}$
 $P_i = 0.8 \text{ W}$

| HW-Rev. | 1.06 | 1.07 | 1.12 / 1.15 |
|---------|--------|---------|-------------|
| C_i | 5 nF | 0.57 nF | 0.57 nF |
| L_i | 0.5 mH | 0.5 mH | 160 μ H |

Measuring circuit type of protection Intrinsic Safety Ex ia IIC or Ex ia IIB
(terminals „1“, „2“, „3“, „4“)
with the following maximum values:

| HW-Rev. | 1.06 / 1.07 | 1.12 / 1.15 |
|----------------|-------------|-------------|
| U_o | 6.5 V | 6.5 V |
| I_o | 25 mA | 17.8 mA |
| P_o | 38 mW | 29 mW |
| characteristic | linear | linear |
| C_i | 49 nF | 118 nF |
| L_i | ≈ 0 | ≈ 0 |

The maximum permissible external inductance and capacitance depend on the connected intrinsically safe circuit as follows:

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passive sensors:

| Type of protection | Ex ia | |
|--------------------|---------|---------|
| | IIC | IIB |
| L _o | 5 mH | 5 mH |
| C _o | 1.55 µF | 8.75 µF |

active sensors with the following maximum values:

$$U_o = 1.2 \text{ V}$$

$$I_o = 50 \text{ mA}$$

$$P_o = 60 \text{ mW}$$

| Type of protection | Ex ia | |
|--------------------|---------|---------|
| | IIC | IIB |
| L _o | 5 mH | 5 mH |
| C _o | 1.05 µF | 6.15 µF |

TTH 200-*1H..

Display- / service interface type of protection Intrinsic Safety Ex ia IIB / IIC
(plug connector) or Ex ib IIB / IIC
with the following maximum values:

$$U_o = 6.2 \text{ V}$$

$$I_o = 65.2 \text{ mA}$$

$$P_o = 101 \text{ mW}$$

linear characteristic

$$C_i \approx 0$$

$$L_i \approx 0$$

| Type of protection | Ex ia / ib | |
|--------------------|------------|--------|
| | IIC | IIB |
| L _o | 5 mH | 5 mH |
| C _o | 1.4 µF | 8.9 µF |

TTR 200-*1 H..

Display- / service interface type of protection Intrinsic Safety Ex ia IIB / IIC
(plug connector) or Ex ib IIB / IIC
with the following maximum values:

$$U_o = 6.2 \text{ V}$$

$$I_o = 65.2 \text{ mA}$$

$$P_o = 101 \text{ mW}$$

linear characteristic

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$$C_i = 30 \text{ nF}$$

$$L_i \approx 0$$

| Type of protection | Ex ia / ib | |
|--------------------|--------------|--------------|
| | IIC | IIB |
| L_o | 5 mH | 5 mH |
| C_o | 1.37 μ F | 8.87 μ F |

The measuring circuit is safely electrically isolated from the supply circuit and from the display / service interface up to total voltage of 30 V.

Temperature measuring transducer: TT*300-*1...

Supply circuit type of protection Intrinsic Safety Ex ia IIB / IIC
(terminals „+“ and „-“ or „+“, „11“, „-“)
or Ex ib IIB / IIC
for connection to certified intrinsically safe circuits

maximum input values:

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

$$I_i = 130 \text{ mA}$$

$$P_i = 0.8 \text{ W}$$

| HW-Rev. | 1.06 | 1.07 |
|---------|--------|---------|
| C_i | 5 nF | 0.57 nF |
| L_i | 0.5 mH | 0.5 mH |

Measuring circuit type of protection Intrinsic Safety Ex ia IIC or Ex ia IIB
(terminals „1“, „2“, „3“, „4“, „5“, „6“ or „1“, „2“, „3“, „4“)
with the following maximum values:

| HW-Rev. | 1.06 / 1.07 |
|----------------|-------------|
| U_o | 6.5 V |
| I_o | 25 mA |
| P_o | 38 mW |
| characteristic | linear |
| C_i | 49 nF |
| L_i | ≈ 0 |

The maximum permissible external inductance and capacitance depend on the connected intrinsically safe circuit as follows:

SCHEDULE TO EU-TYPE EXAMINATION CERTIFICATE PTB 05 ATEX 2017 X, Issue: 01

passive sensors:

| Type of protection | Ex ia | |
|--------------------|---------|---------|
| | IIC | IIB |
| L _o | 5 mH | 5 mH |
| C _o | 1.55 µF | 8.75 µF |

active sensors with the following maximum values:

$$U_o = 1.2 \text{ V}$$

$$I_o = 50 \text{ mA}$$

$$P_o = 60 \text{ mW}$$

| Type of protection | Ex ia | |
|--------------------|---------|---------|
| | IIC | IIB |
| L _o | 5 mH | 5 mH |
| C _o | 1.05 µF | 6.15 µF |

Temperature measuring transducer: TTH 300-*1H..

Display- / service interface type of protection Intrinsic Safety Ex ia IIB / IIC
(plug connector) or Ex ib IIB / IIC
with the following maximum values:

$$U_o = 6.2 \text{ V}$$

$$I_o = 65.2 \text{ mA}$$

$$P_o = 101 \text{ mW}$$

linear characteristic

$$C_i \approx 0$$

$$L_i \approx 0$$

| Type of protection | Ex ia / ib | |
|--------------------|------------|--------|
| | IIC | IIB |
| L _o | 5 mH | 5 mH |
| C _o | 1.4 µF | 8.9 µF |

The measuring circuit is safely electrically isolated from the supply circuit and from the display / service interface up to total voltage of 30 V.

(16) Test Report PTB Ex 17-26148

(17) Specific conditions of use

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1. The connection facilities of the temperature measuring transducers of types TTH 300-*1H../ TTH 200-*1H.. shall be installed as such, that the degree of protection IP 20 according to EN 60529 is met as a minimum.
2. Inadmissible electrostatic charge of the plastic housing of the temperature measuring transducers of types TTH 300-*1H../ TTH 200-*1H.. as well as TTR 200-*1 H.. shall be avoided and a warning label shall be provided on the equipment.
3. For the application as EPL Ga equipment the temperature measuring transducers of type TTF 300-*1 A.H, type TTF 300-*1 C.H, type TTF 200-*1 A.H or type TTF 200-*1 E.H shall be installed as such, that they are protected against strong impact or friction.

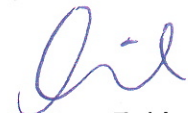
(18) Essential health and safety requirements

Met by compliance with the aforementioned standards.

According to Article 41 of Directive 2014/34/EU, EC-type examination certificates which have been issued according to Directive 94/9/EC prior to the date of coming into force of Directive 2014/34/EU (April 20, 2016) may be considered as if they were issued already in compliance with Directive 2014/34/EU. By permission of the European Commission supplements to such EC-type examination certificates and new issues of such certificates may continue to hold the original certificate number issued before April 20, 2016.

Konformitätsbewertungsstelle, Sektor Explosionsschutz
On behalf of PTB:

Braunschweig, November 15, 2017



Dr.-Ing. F. Lienesch
Direktor und Professor

