



(1) EC-TYPE-EXAMINATION CERTIFICATE (Translation)

(2) Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres - **Directive 94/9/EC**



(3) EC-type-examination Certificate Number:

PTB 05 ATEX 2017 X

(4) Equipment: Temperature measuring transducer, type TTH 300-Ex

(5) Manufacturer: ABB Automation Products GmbH

(6) Address: Borsigstraße 2, 63754 Alzenau, Germany

(7) This equipment and any acceptable variation thereto are 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 9 of the Council Directive 94/9/EC of 23 March 1994, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres, given in Annex II to the Directive.

The examination and test results are recorded in the confidential report PTB Ex 05-24358 .

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

EN 50014:1997 + A1 + A2 EN 50020:2002 EN 50284:1999 EN 1127-1:1997

(10) If the sign "X" is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the schedule to this certificate.

(11) This EC-type-examination Certificate relates only to the design, examination and tests of the specified equipment in accordance to the Directive 94/9/EC. Further requirements of the Directive apply to the manufacturing process and supply of this equipment. These are not covered by this certificate.

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

II 1 G EEx ia IIC T6
resp. II 2(1) G EEx [ia] ib IIC T6
resp. II 2 G (1D) Ex [iaD] ib IIC T6

Zertifizierungsstelle Explosionsschutz
By order:

Braunschweig, July 6, 2005

Dr.-Ing. U. Johannsmeyer
Direktor und Professor



(13)

SCHEDULE

(14)

EC-TYPE-EXAMINATION CERTIFICATE PTB 05 ATEX 2017 X

(15) Description of equipment

In combination with sensors the temperature measuring transducers of type TTH 300-Ex are used 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.

For relationship between permissible ambient temperature range, temperature class and the respective equipment categories, reference is made to the following table:

Category-1-application:

temperature class	T6	T5	T4, T3, T2, T1
permissible range of the ambient temperature	-50 °C...+44 °C	-50 °C...+56 °C	-50 °C...+84°C

Category-2-application:

temperature class	T6	T5	T4, T3, T2, T1
permissible range of the ambient temperature	-50 °C...+56 °C	-50 °C...+71 °C	-50 °C...+85°C

Electrical data

Supply circuittype of protection Intrinsic Safety EEx ia IIB / IIC
 (clamp or soldering terminals or EEx ib IIB / IIC
 „+“ and „-“) only for connection to certified intrinsically safe circuits
 Maximum input values:
 $U_i = 30 \text{ V}$
 $I_i = 130 \text{ mA}$
 $P_i = 0.8 \text{ W}$
 $C_i \approx 0$
 $L_i \approx 0$

SCHEDULE TO EC-TYPE-EXAMINATION CERTIFICATE PTB 05 ATEX 2017 X

Measuring circuit type of protection Intrinsic Safety EEx ia IIC or EEx ia IIB
(clamp or soldering terminals with the following maximum values:

1, 2, 3, 4, 5 and 6)

$$U_o = 6.5 \text{ V}$$

$$I_o = 25 \text{ mA}$$

$$P_o = 38 \text{ mW}$$

linear characteristic

$$C_i = 49 \text{ nF}$$

$$L_i \approx 0$$

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

passive sensors:

type of protection	EEx 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	EEx ia	
	IIC	IIB
L_o	5 mH	5 mH
C_o	1.05 μF	6.15 μF

Display- / service interface type of protection Intrinsic Safety EEx ia IIB / IIC
(plug connector) or EEx 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	EEx ia / ib	
	IIC	IIB
L_o	5 mH	5 mH
C_o	1.4 μF	8.9 μF

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

(16) Test report PTB Ex 05-24358

(17) Special conditions for safe use

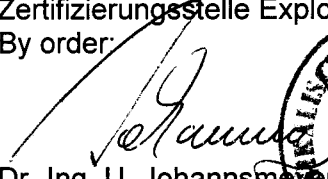
1. The connection facilities of the temperature measuring transducer, type TTH 300-Ex shall be installed as such, that the degree of protection IP 20 according to IEC-Publication 60529:1989 is met as a minimum.
2. Inadmissible electrostatic charge of the plastic housing of the temperature measuring transducer, type TTH 300-Ex shall be avoided (warning label on the equipment).

(18) Essential health and safety requirements

met by compliance with the standards mentioned above

Zertifizierungsstelle Explosionsschutz
By order:

Braunschweig, July 6, 2005


Dr.-Ing. U. Johannsmeyer
Direktor und Professor






1st SUPPLEMENT

according to Directive 94/9/EC Annex III.6

to EC-TYPE-EXAMINATION CERTIFICATE PTB 05 ATEX 2017 X

(Translation)

Equipment: Temperature measuring transducer, type TTH 300-Ex

Marking:  II 1 G EEx ia IIC T6
 or  II 2 (1) G EEx [ia] ib IIC T6
 or  II 2 G (1D) Ex [iaD] ib IIC T6

Manufacturer: ABB Automation Products GmbH

Address: Borsigstraße 2
 63754 Alzenau, Germany

Description of supplements and modifications

The modifications concern the type designation of the temperature measuring transducers; the extension of the EC Type Examination Certificate, which now also covers the temperature measuring transducers, type TTF300-.....; the internal structure as well as the "Electrical data". All other specifications also apply to this first supplement without changes. The "special conditions" have to be adapted to the changed type designation.

The type designation of the temperature measuring transducer, type TTH 300-Ex will in future be type TTH 300-..... .

The EC Type Examination Certificate thus comprises temperature measuring transducers according to the following type key:

TTH 300-E1.....: temperature transducer TTH 300-..... , ATEX version
TTF 300-E1 A.....: TTH 300-E1.....:in single-chamber housing (AGLF) / without display
TTF 300-E1 B.....: TTH 300-E1.....:in single-chamber housing (AGSF) / without display
TTF 300-E1 C.....: TTH 300-E1.....:in single-chamber housing (AGLFD) /with LCD display HMI type A
TTF 300-E1 D.....: TTH 300-E1.....:in single-chamber housing (AGSFD) /with LCD display HMI type A

Electrical data

Supply circuit type of protection Intrinsic Safety EEx ia IIB / IIC
 (clamp terminals or or EEx ib IIB / IIC
 solder termination "+" and "-") only for connection to certified intrinsically safe circuits

Maximum input values:

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

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

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

$$C_i \approx 5 \text{ nF}$$

$$L_i \approx 0.5 \text{ mH}$$

Measuring circuit..... type of protection Intrinsic Safety EEx ia IIC or EEx ia IIB
 (clamp terminals or with the following maximum values:
 solder termination 1, 2, 3, 4, 5 and 6)

$$U_o = 6.5 \text{ V}$$

$$I_o = 25 \text{ mA}$$

$$P_o = 38 \text{ mW}$$

linear characteristic

$$C_i = 49 \text{ nF}$$

$$L_i \approx 0$$

The maximum permissible external inductance and capacitance depend on the connected intrinsically safe circuit in the following manner:

Passive transmitters:

type of protection	EEx ia	
	IIC	IIB
L_o	5 mH	5 mH
C_o	1.55 μ F	8.75 μ F

Active transmitters with the following maximum values:

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

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

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

type of protection	EEx ia	
	IIC	IIB
L_o	5 mH	5 mH
C_o	1.05 μ F	6.15 μ F




2. SUPPLEMENT

according to Directive 94/9/EC Annex III.6

to EC-TYPE-EXAMINATION CERTIFICATE PTB 05 ATEX 2017 X

(Translation)

Equipment: Temperature measuring transducer, type TTH 300-Ex

Marking:  II 1 G EEx ia IIC T6
 or  II 2 (1) G EEx [ia] ib IIC T6
 or  II 2 G (1D) Ex [iaD] ib IIC T6

Manufacturer: ABB Automation Products GmbH

Address: Borsigstraße 2, 63754 Alzenau, Germany

Description of supplements and modifications

The modifications concern:

- a further specification of relevant characters in the type code of the temperature measuring transducers, types TTH 300-E1... and TTF300-E1... (communication protocol),
- the extension of the EC-type examination certificate for the temperature measuring transducer, type TTH 200-E1H..,
- the internal construction of the temperature measuring transducers, types TTH 300-E1H.. / TTH 200-E1H..,
- the extension of the EC-type examination certificate for the temperature measuring transducer, type TTF350-E1..H (installation of a temperature measuring transducer, type TTH 300-E1H.. / TTH 200-E1H.. into a 2-chamber housing without or with LCD-Display HMI, type B),
- as well as the extension of the EC-type examination certificate for the temperature measuring transducer, type TTR.00-E1H (installation of the electronics system of a temperature measuring transducer, type TTH 300-E1H.. / TTH 200-E1H.. into a mounting rail enclosure).

Therefore the EC-type examination certificate comprises the temperature measuring transducers according to the following type code:

TTH 300-E1H.. : temperature measuring transducer TTH 300-.... analog HART, ATEX-version
TTH 200-E1H.. : temperature measuring transducer TTH 200-.... analog HART, ATEX-version
TTR 300-E1 H : Electronics system of TTH 300-E1H.. casted inside of a mounting rail enclosure
TTR 200-E1 H : Electronics system of TTH 200-E1H.. casted inside of a mounting rail enclosure
TTF 300-E1 A.H : TTH 300-E1H.. in single-chamber housing (AGLF) / without display

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TTF 300-E1 B.H : TTH 300-E1H.. in single-chamber housing (AGSF) / without display
 TTF 300-E1 C.H : TTH 300-E1H.. in single-chamber housing (AGLFD) /with LCD display HMI type A
 TTF 300-E1 D.H : TTH 300-E1H.. in single-chamber housing (AGSFD) /with LCD display HMI type A
 TTF 350-E1 N.H : TTH 300-E1H.. in dual-chamber housing / without display
 TTF 350-E1 R.H : TTH 300-E1H.. in dual-chamber housing / with LCD-display HMI type B

The "Special Conditions" as well as the "Electrical data" change as described below:

Electrical data

For the permissible ambient temperature range depending on the temperature class and the respective equipment category reference is made to the following tables:

Application as category-1-equipment:

temperature class	T6	T5	T4, T3, T2, T1
permissible ambient temperature range	-50 °C...+44 °C	-50 °C...+56 °C	-50 °C...+60 °C

Application as category-2-equipment:

temperature class	T6	T5	T4, T3, T2, T1
permissible ambient temperature range	-50 °C...+56 °C	-50 °C...+71 °C	-50 °C...+85 °C

Temperature measuring transducer: TTH 300-E1H.. ; TTH 200-E1H.. ; TTF 300-E1 A.H ;
 TTF 300-E1 B.H ; TTF 300-E1 C.H ; TTF 300-E1 D.H ;
 TTF 350-E1 N.H ; TTF 350-E1 R.H ;

Supply circuit type of protection Intrinsic Safety EEx ia IIB / IIC
 (terminals "+" and "-") or EEx ib IIB / IIC
 only for connection to certified intrinsically safe circuits
 Maximum input values:
 $U_i = 30 \text{ V}$
 $I_i = 130 \text{ mA}$
 $P_i = 0.8 \text{ W}$

 $C_i \approx 5 \text{ nF}$
 $L_i \approx 0.5 \text{ mH}$

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type of protection	EEx ia / ib	
	IIC	IIB
L_o	5 mH	5 mH
C_o	1.4 μ F	8.9 μ F

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

Temperature measuring transducer: TTR 300-E1 H; TTR 200-E1 H

Supply circuit type of protection Intrinsic Safety EEx ia IIB / IIC
 (terminals "+", "11" and "-") or EEx ib IIB / IIC
 only for connection to certified intrinsically safe circuits
 Maximum input values:
 $U_i = 30 \text{ V}$
 $I_i = 130 \text{ mA}$
 $P_i = 0.8 \text{ W}$

 $C_i \approx 5 \text{ nF}$
 $L_i \approx 0.5 \text{ mH}$

Measuring circuit..... type of protection Intrinsic Safety EEx ia IIC or EEx ia IIB
 (terminals 1, 2, 3, 4, 5 and 6) with the following maximum values:
 $U_o = 6.5 \text{ V}$
 $I_o = 25 \text{ mA}$
 $P_o = 38 \text{ mW}$
 linear characteristic
 $C_i = 49 \text{ nF}$
 $L_i \approx 0$

The maximum permissible external inductance and capacitance depend on the connected intrinsically safe circuit in the following manner:

Passive transmitters:

type of protection	EEx ia	
	IIC	IIB
L_o	5 mH	5 mH
C_o	1.55 μ F	8.75 μ F

2. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 05 ATEX 2017 X

Active transmitters with the following maximum values:

$$\begin{aligned}
 U_o &= 1.2 \text{ V} \\
 I_o &= 50 \text{ mA} \\
 P_o &= 60 \text{ mW}
 \end{aligned}$$

type of protection	EEx ia	
	IIC	IIB
L_o	5 mH	5 mH
C_o	1.05 μF	6.15 μF

Display / service interface type of protection Intrinsic Safety EEx ia IIB / IIC
(plug connector) or EEx ib IIB / IIC

with the following maximum values:

$$\begin{aligned}
 U_o &= 6.2 \text{ V} \\
 I_o &= 65.2 \text{ mA} \\
 P_o &= 101 \text{ mW}
 \end{aligned}$$

linear characteristic

$$\begin{aligned}
 C_i &\approx 0 \\
 L_i &\approx 0
 \end{aligned}$$

type of protection	EEx ia / ib	
	IIC	IIB
L_o	5 mH	5 mH
C_o	1.37 μF	8.87 μF

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

Special conditions for safe use

1. The connection facilities of the temperature measuring transducer, type TTH 300-E1H.. / TTH 200-E1H.. shall be installed as such, that the degree of protection IP 20 according to IEC-Publication 60529:1989 is fulfilled as a minimum.
2. Inadmissible electrostatic charge of the plastic housing of the temperature measuring transducers, types TTH 300-E1H.. / TTH 200-E1H.. as well as TTR 300-E1 H / TTR 200-E1 H shall be avoided. A warning label affixed on the equipment shall point to this risk.

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2. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 05 ATEX 2017 X

Applied standards

EN 50014:1997 + A1 + A2 EN 50020:2002 EN 50284:1999 EN 1127-1:1997

Test report: PTB Ex 07-27036

Zertifizierungsstelle Explosionschutz
By order:

Dr.-Ing. U. Johannsmeyer
Direktor und Professor



Braunschweig, December 18, 2007