



## (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 09 ATEX 2016 X**

(4) Equipment: Temperature measuring transducers, types TTH x00-E1P, TTH x00-E1F, TTF 300-E1 x.P, TTF 300-E1 x.F, TTF 350-E1 x.P, TTF 350-E1 x.F, TTR x00-E1P as well as TTR x00-E1F

(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 assessment and test report PTB Ex 10-28284.

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:  
**EN 60079-0:2006                      EN 60079-11:2007                      EN 60079-26:2007**  
**EN 60079-27:2006                      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 Ex ia IIC T6 or II 2 (1) G Ex [ia] ib IIC T6 or  
 II 2 G (1D) Ex [iaD] ib IIC T6

Zertifizierungssektor Explosionschutz  
By order:

Braunschweig, March 26, 2010

Dr.-Ing. U. Gerlach  
Oberregierungsrat



(13)

## SCHEDULE

(14)

### EC-TYPE-EXAMINATION CERTIFICATE PTB 09 ATEX 2016 X

(15) Description of equipment

In connection with measuring sensors the temperature measuring transducers listed in the type code below serve for the detection, amplification and transmission of measurands in intrinsically safe circuits.

Supply and communication is provided by means of an intrinsically safe fieldbus (e.g. Fieldbus Foundation H1 or Profibus PA).

Resistance thermometers, thermocouples or other sensors with defined quantities of resistance and direct voltage may be connected alternatively to the input as sensors.

The EC-type examination certificate includes the temperature measuring transducers according to the following type code:

#### Type code:

TTH 300-E1P :	temperature measuring transducer TTH 300-.... analog, Profibus PA, ATEX
TTH 300-E1F :	temperature measuring transducer TTH 300-.... analog, Fieldbus Foundation, ATEX
TTH 200-E1P :	temperature measuring transducer TTH 200-.... analog, Profibus PA, ATEX
TTH 200-E1F :	temperature measuring transducer TTH 200-.... analog, Fieldbus Foundation, ATEX
TTR 300-E1P :	Elektronic system of TTH 300-E1P encapsulated in terminal rail enclosure
TTR 300-E1F :	Elektronic system of TTH 300-E1F encapsulated in terminal rail enclosure
TTR 200-E1P :	Elektronic system of TTH 200-E1P encapsulated in terminal rail enclosure
TTR 200-E1F :	Elektronic system of TTH 200-E1F encapsulated in terminal rail enclosure
TTF 300-E1 A.P :	TTH 300-E1P in single-chamber enclosure (AGLF) / without indicator
TTF 300-E1 A.F :	TTH 300-E1F in single-chamber enclosure (AGLF) / without indicator
TTF 300-E1 B.P :	TTH 300-E1P in single-chamber enclosure (AGSF) / without indicator
TTF 300-E1 B.F :	TTH 300-E1F in single-chamber enclosure (AGSF) / without indicator
TTF 300-E1 C.P :	TTH 300-E1P in single-chamber enclosure (AGLFD) / LCD-indicator HMI type A or B
TTF 300-E1 C.F :	TTH 300-E1F in single-chamber enclosure (AGLFD) / LCD-indicator HMI type A or B
TTF 300-E1 D.P :	TTH 300-E1P in single-chamber enclosure (AGSFD) / LCD-indicator HMI type A or B
TTF 300-E1 D.F :	TTH 300-E1F in single-chamber enclosure (AGSFD) / LCD-indicator HMI type A or B
TTF 350-E1 N.P :	TTH 300-E1P in double-chamber enclosure / without indicator
TTF 350-E1 N.F :	TTH 300-E1F in double-chamber enclosure / without indicator
TTF 350-E1 R.P :	TTH 300-E1P in double-chamber enclosure / LCD-indicator HMI type B
TTF 350-E1 R.F :	TTH 300-E1F in double-chamber enclosure / LCD-indicator HMI type B

# Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin

## SCHEDULE TO EC-TYPE-EXAMINATION CERTIFICATE PTB 09 ATEX 2016 X

### Electrical data

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

Equipment 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...+60 °C

Equipment 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

**Suppli circuit**..... **Profibus PA (FISCO)**  
 (clamps or solder terminations „+“ and „-“) **Fieldbus Foundation FF (FISCO)**  
 TTH 300-E1P, TTH 300-E1F, type of protection Intrinsic Safety Ex ia IIC  
 TTH 200-E1P, TTH 200-E1F, or Ex ia IIB  
 TTR 300-E1P, TTR 300-E1F, FISCO Feldgerät  
 TTR 200-E1P, TTR 200-E1F,  
 TTF 300-E1 A.P, TTF 300-E1 A.F,  
 TTF 300-E1 B.P, TTF 300-E1 B.F,  
 TTF 300-E1 C.P, TTF 300-E1 C.F, oder  
 TTF 300-E1 D.P, TTF 300-E1 D.F,  
 TTF 350-E1 N.P, TTF 350-E1 N.F,  
 TTF 350-E1 R.P, TTF 350-E1 R.F

**Fieldbus Foundation (FF) Entity model I.S.**  
 type of protection Intrinsic Safety Ex ia IIC  
 only for connection to certified intrinsically safe  
 circuits with the following maximum values:

$U_i = 24 \text{ V}$   
 $I_i = 250 \text{ mA}$   
 $P_i = 1.2 \text{ W}$

$C_i = 5 \text{ nF}$   
 $L_i = 10 \text{ } \mu\text{H}$

**Measuring circuit**..... type of protection Intrinsic Safety Ex ia IIC  
 (clamps or solder terminations ..... or Ex ia IIB  
 1, 2, 3, 4, 5 and 6)..... with the following maximum values:

TTH 300-E1P, TTH 300-E1F,  
 TTF 300-E1 A.P, TTF 300-E1 A.F,  
 TTF 300-E1 B.P, TTF 300-E1 B.F,  
 TTF 300-E1 C.P, TTF 300-E1 C.F,  
 TTF 300-E1 D.P, TTF 300-E1 D.F,  
 TTF 350-E1 N.P, TTF 350-E1 N.F,  
 TTF 350-E1 R.P, TTF 350-E1 R.F,  
 300-E1P, TTR 300-E1F

$U_o = 6.5 \text{ V}$   
 $I_o = 25 \text{ mA}$   
 $P_o = 38 \text{ mW}$   
 linear characteristic  
 $C_i = 49 \text{ nF}$   
 $L_i \approx 0$   
 The maximum permissible external inductances TTR  
 and capacitances depend on the connected  
 intrinsically safe circuit as follows:

passive sensors:

type of protection	Ex ia	
	IIC	IIB
$L_o$	5 mH	5 mH
$C_o$	1.55 $\mu\text{F}$	8.75 $\mu\text{F}$

(clamps or solder terminations  
 1, 2, 3, and 4)  
 TTH 200-E1P, TTH 200-E1F,  
 TTR 200-E1P, TTR 200-E1F

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 $\mu\text{F}$	6.15 $\mu\text{F}$

**Display- / service interface**..... type of protection Intrinsic Safety Ex ia IIB / IIC  
 (plug connector)..... or Ex ib IIB / IIC

TTH 300-E1P, TTH 300-E1F, ..... with the following maximum values:  
 TTH 200-E1P, TTH 200-E1F,  
 TTF 300-E1 A.P, TTF 300-E1 A.F,  
 TTF 300-E1 B.P, TTF 300-E1 B.F,  
 TTF 300-E1 C.P, TTF 300-E1 C.F,  
 TTF 300-E1 D.P, TTF 300-E1 D.F,  
 TTF 350-E1 N.P, TTF 350-E1 N.F,  
 TTF 350-E1 R.P, TTF 350-E1 R.F

$U_o = 6.2 \text{ V}$   
 $I_o = 65.2 \text{ mA}$   
 $P_o = 101 \text{ mW}$   
 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 $\mu$ F	8.9 $\mu$ F

(plug connector)  
**TTR 300-E1P, TTR 300-E1F,**  
**TTR 200-E1P, TTR 200-E1F**

type of protection Intrinsic Safety Ex ia IIB / IIC  
 or Ex ib IIB / IIC  
 with the following maximum values:

$U_o = 6.2$  V  
 $I_o = 65.2$  mA  
 $P_o = 101$  mW  
 linear characteristic  
 $C_i = 30$  nF  
 $L_i \approx 0$

type of protection	Ex ia / ib	
	IIC	IIB
$L_o$	5 mH	5 mH
$C_o$	1.37 $\mu$ F	8.87 $\mu$ F

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

(16) Assessment and test report PTB Ex 10-28284

(17) Special conditions for safe use

1. The connection facilities of the temperature measuring transducer, type TTH x00-E1P and type TTH x00-E1F shall be installed as such that a degree of protection of IP 20 according to IEC 60529:1989 is provided as a minimum.
2. Electrostatic charge of the plastic enclosure used for the temperature measuring transducers of types TTH x00-E1P, TTH x00-E1F, TTR x00-E1P as well as TTR x00-E1F shall be prevented and a warning label on the equipment shall point to this danger.

# Physikalisch-Technische Bundesanstalt




Braunschweig und Berlin

SCHEDULE TO EC-TYPE-EXAMINATION CERTIFICATE PTB 09 ATEX 2016 X

(18) Essential health and safety requirements

met by compliance with the standards mentioned above

Zertifizierungssektor Explosionschutz  
By order:

  
Dr.-Ing. U. Gerlach  
Oberregierungsrat



Braunschweig, March 26, 2010


## 1. SUPPLEMENT

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

to EC-TYPE-EXAMINATION CERTIFICATE PTB 09 ATEX 2016 X

(Translation)

Equipment: Temperature measuring transducers, types TTH x00-E1P, TTH x00-E1F, TTF 300-E1 x.P, TTF 300-E1 x.F, TTF 350-E1 x.P, TTF 350-E1 x.F, TTR x00-E1P as well as TTR x00-E1F

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

Manufacturer: ABB Automation Products GmbH

Address: Schillerstraße 72, 32425 Minden, Germany  
formerly  
Borsigstraße 2, 63755 Alzenau, Germany

### Description of supplements and modifications

The modifications concern the adaption to the current state of the standards, the internal construction as well as the plastic enclosures of the temperature measuring transducers of types TTH x00-E1P, TTH x00-E1F, TTF 300-E1 x.P, TTF 300-E1 x.F, TTF 350-E1 x.P und TTF 350-E1 x.F.

The "Electrical data", the "Special conditions" as well as all other specifications apply without changes also to this 1<sup>st</sup> supplement to EC-type examination certificate PTB 09 ATEX 2016 X.

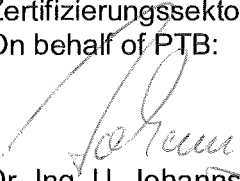
### Applied standards

EN 60079-0:2009      EN 60079-11:2007      EN 60079-27:2008      EN 1127-1:2007

Assessment and test report: PTB Ex 11-20154

Zertifizierungssektor Explosionsschutz  
On behalf of PTB:

Braunschweig, November 17, 2011

  
Dr.-Ing. U. Johannsmeyer  
Direktor und Professor



Sheet 1/1