



(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 14 ATEX 2010 X



(4) Equipment: Wireless temperature sensor, type TSP3a1-W bb ccc ... dd ee ...
and temperature transducer, type TTF300-W aa b ...

(5) Manufacturer: ABB Automation GmbH

(6) Address: Schillerstraße 72, 32425 Minden, 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 test report PTB Ex 14-24181.

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

EN 60079-0:2012

EN 60079-11:2012

(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 T4 Ga

Konformitätsbewertungsstelle, Sektor Explosionsschutz

Braunschweig, November 20, 2014

On behalf of PTB:

Dr.-Ing. T. Horn
Regierungsrat



sheet 1/5

(13)

SCHEDULE

(14)

EC-TYPE-EXAMINATION CERTIFICATE PTB 14 ATEX 2010 X

(15) Description of equipment

The wireless temperature sensor, type TSP3a1-W bb ccc ... dd ee ... and the temperature measuring transducer, type TTF300-W aa b ... are intrinsically safe equipment intended for autarkic temperature measurement with integrated (TSP3a1-W bb ccc ... dd ee ...) or externally connectable (TTF300-W aa b ...) resistance sensors or thermo-elements. The measured values are transmitted wireless using the WirelessHART® radio standard. Power supply is realized by a replaceable primary battery and type TSP3a1-W bb ccc ... dd ee ... is additionally provided with an optional Energy-Harvester using the temperature difference between process connection and ambient. The enclosure of the equipment can be made alternatively from aluminium or stainless steel. Furthermore an LCD-display is applicable. An intrinsically safe interface in the equipment is intended for connection of certified HART-configuration terminals.

Type code:

Temperature-measuring transducer, type TTF300-W aa b ...

aa : Explosion protection

A6: ATEX, type of protection Intrinsic Safety

H6: IECEx, type of protection Intrinsic Safety (Not subject matter of this EC-type examination certificate)

b : Gehäuse / Anzeiger

A: Aluminium enclosure, without LCD-display

B: Stainless steel enclosure, without LCD-display

C: Aluminium enclosure, with LCD-display

D: Stainless steel enclosure, with LCD-display

Temperature sensor, type TSP3a1-W bb ccc ... dd ee ...

a : Basic model

1: Temperature sensor, for installation into an existing conduit

2: Temperature sensor, welded conduit with neck tube, undivided

3: Temperature sensor, with neck tube and drilled conduit

4: Temperature sensor, for surface-mounting

bb : Explosion protection

A6: ATEX, type of protection Intrinsic Safety

H6: IECEx, type of protection Intrinsic Safety (Not subject matter of this EC-type examination certificate)

ccc : Retaining plate (only for TSP341-W)

Y11: Surface measurement, 90° angle to conduit
 Y22: Surface measurement, along the conduit, 1.4571
 Y23: Surface measurement, along the conduit, 1.4404

dd : Connection head

L2: Aluminium, with screwed cap
 L4: Aluminium, with screwed cap and LCD-display
 S2: Stainless steel, with screwed cap
 S4: Stainless steel, with screwed cap and LCD-display

ee : Measuring transducer

W1: WirelessHART
 W3: WirelessHART + Energy-Harvester

The permissible range of the ambient temperature for the wireless temperature measuring transducer, type TTF300-W aa b ... is $-50\text{ °C} \leq T_a \leq 70\text{ °C}$.

The permissible range of the ambient temperature for the wireless temperature sensor, type TSP3a1-W bb ccc ... dd ee ... is $-40\text{ °C} \leq T_a \leq 70\text{ °C}$.

Electrical data:

Supply circuit built-in SOCl_2 / Lithium battery
 Type: ABB 3KXT00029U0000
 3.6 V

HART Service Port type of protection Intrinsic Safety Ex ia IIB / IIC
 (clamping lug) with the following maximum values:

$U_o = 5.4\text{ V}$
 $I_o = 25\text{ mA}$
 $P_o = 34\text{ mW}$
 linear characteristic
 $C_i = 1.2\text{ }\mu\text{F}$
 $L_i \approx 0$

Type of protection	Ex ia	
	IIC	IIB
L_o	5 mH	5 mH
C_o	1.1 μF	11.8 μF

only for connection of certified intrinsically safe

HART-configuration equipment

Maximum values:

$$U_i = 2.6 \text{ V}$$

$$I_i = 18 \text{ mA}$$

linear characteristic

resulting to the following maximum permissible external inductances and capacitances:

Type of protection	Ex ia	
	IIC	IIB
L_o	1 mH	5 mH
C_o	400 nF	4.7 μ F

TTF300-W aa b ...

Sensor circuit.....type of protection Intrinsic Safety Ex ia IIC/IIB
(terminals 1, 2, 3, 4, 5 and 6) with the following maximum values:

$$U_o = 5.4 \text{ V}$$

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

$$P_o = 34 \text{ mW}$$

linear characteristic

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

$$L_i \approx 0$$

The maximum permissible external inductances 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	2.25 μ F	12.95 μ F

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	1.45 μ F	8.35 μ F

(16) Test report PTB Ex 14-24083

(17) Special conditions for safe use

Variants designed with aluminium (TSP3x1-W A6 ccc ... Ld ee ... or TSP3x1-W A6 ccc ... dd W3 ... or TSP341-W A6 Y11 ... dd ee ... or TTF300-W A6 A ... or TTF300-W A6 C ...) shall be additionally protected mechanically when they are installed in hazardous areas requiring the application of EPL-Ga equipment.


(18) Essential health and safety requirements

met by compliance with the standards mentioned above

Konformitätsbewertungsstelle, Sektor Explosionsschutz

Braunschweig, November 20, 2014

On behalf of PTB



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