IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification System for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate history:
Issue 0 (2021-01-13)

Certificate No.: **IECEx PTB 20.0035X**

Status: **Current**

Issue No: 1

Date of Issue: 2024-02-16

Applicant: **ABB AG**
Schillerstraße 72
Minden 32425
Germany

Equipment: **Temperature measuring transducer**

Optional accessory: type TTH300, TTH300-N, TTH200, TTR200, TTF300, TTF300-N, TTF200 (all HW rev. 2.0)

Type of Protection: **intrinsic safety, increased safety, non sparking device**

Marking:
Ex ia IIC T6 ... T1 Ga
Ex [ia IIC Ga] ib IIC T6 ... T1 Gb
Ex [ia IIIC Da] ib IIC T6 ... T1 Gb
Ex ec IIC T6 ... T1 Gc
Ex nA IIC T6 ... T1 Gc

Approved for issue on behalf of the IECEx Certification Body: **Dr. Ing. Thomas Horn**

Position: **Head of Working Group "Intrinsic Safety"**

Signature:
(for printed version)

Date:
(for printed version)

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting www.iecex.com or use of this QR Code.

Certificate issued by:

Physikalisch-Technische Bundesanstalt (PTB)
Bundesallee 100
38116 Braunschweig
Germany

Physikalisch-Technische Bundesanstalt
Braunschweig und Berlin

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Manufacturer:
ABB AG
Schillerstraße 72
Minden 32425
Germany

Manufacturing locations:

ABB Engineering (Shanghai) Ltd.
No.4528, KangXin Highway,
PuDong New District,
Shanghai, , 201319
China

ABB Bulgaria EOOD – Rakovski Branch
Industrial Zone Trakia
16, Nedyalka Shileva Str.
Plovdiv 4023
Bulgaria

ABB India Limited
Process Automation - Measurement Products
Plot No. 5 & 6, 2nd Phase, Peenya Industrial Area
Bangalore - 560058
India
India

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 equipment 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

IEC 60079-0:2017 Explosive atmospheres - Part 0: Equipment - General requirements
Edition:7.0

IEC 60079-11:2011 Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
Edition:6.0

IEC 60079-15:2010 Explosive atmospheres - Part 15: Equipment protection by type of protection "n"
Edition:4

IEC 60079-7:2017 Explosive atmospheres - Part 7: Equipment protection by increased safety "e"
Edition:5.1

This Certificate **does not** indicate compliance with 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/PTB/ExTR20.0037/00

Quality Assessment Reports:

DE/TUN/QAR06.0012/08 GB/FME/QAR10.0007/13 GB/ITS/QAR16.0002/04

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EQUIPMENT:
Equipment and systems covered by this Certificate are as follows:

In combination with temperature sensors or detecting elements the temperature measuring transducers are used for the detection, amplification and transmission of measurands in intrinsically safe circuits. The acquisition of measured values is carried out alternatively by means of RTD´s, thermo-couples or sensors with defined resistance or direct voltage quantities. The output signal which corresponds to the measured input quantity can be provided as a 4mA … 20mA-signal and as a HART-protocol-signal.

Temperature range, temperature classes, type codes and electrical data are given in the attachment.

SPECIFIC CONDITIONS OF USE: YES as shown below:
Specific Conditions are listed in the attachment.

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DETAILS OF CERTIFICATE CHANGES (for issues 1 and above)
Name of applicant/manufacturer changed.
New manufacturer location added (ABB India Limited).
QARs updated.

No technical changes were made to the product.

Annex:

COCA200035-01.pdf

Applicant: ABB Automation Products GmbH

Electrical Apparatus: Temperature measuring transducer

type TTH300, TTH300-N, TTH200, TTR200,
TTF300, TTF300-N, TTF200
(each HW Rev. 2.0)

Description of equipment

In combination with temperature sensors or detecting elements the temperature measuring transducers are used for the detection, amplification and transmission of measurands in intrinsically safe circuits. The acquisition of measured values is carried out alternatively by means of RTD´s, thermo-couples or sensors with defined resistance or direct voltage quantities. The output signal which corresponds to the measured input quantity can be provided as a 4 mA … 20 mA-signal and as a HART-protocol-signal.

The temperature measuring transducers are intended for the application in hazardous areas for the following ambient temperature ranges:

Temperature class	Ambient temperature range
T6, T5	-50°C … +56°C
T4 … T1	-50°C … +85°C

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Type code

TT * * -* ** * H …**

Temperature-measuring transducer

H	Head-type installation
F	Field device
R	DIN-rail installation

200	1 Measuring channel
300	2 Measuring channels

	Standard measurement
N-	Non-invasive measurement

E1	ATEX Intrinsic Safety
H1	IECEx Intrinsic Safety
E2	ATEX Non-sparking device or Increased Safety
H2	IECEx Non-sparking device or Increased Safety

Enclosure for TTFx00

A.	AGLF without indicator
B.	AGSF without indicator
C.	AGLFD with display
D.	AGSFD with display
E.	AGLFD with display
F.	AGSFD with display

HART variant

Manufacturer-specific extensions

Electrical data in the type of protection Intrinsic Safety

The device is supplied as a category 1 equipment or as category 2 equipment in the type of protection Intrinsic Safety. The measuring circuit and the terminals of the display/service interface are intrinsically safe.

Supply circuit

(terminals '+' and '-' or '8+' and '7-')

Type of protection Intrinsic Safety Ex ia IIB/IIC or Ex ib IIB/IIC only for connection to a certified intrinsically safe circuit

Maximum values:

U_i = 30 V
I_i = 130 mA
P_i = 0.8 W

C_i = 0.57 nF
L_i = 160 µH

Measuring circuit

(terminals '1', '2', '3', '4' or '1', '2', '3', '4', '5', '6')

Type of protection Intrinsic Safety Ex ia IIC/IIB/IIIC

Maximum values:

U_o = 6.5 V
I_o = 17.8 mA
P_o = 29 mW

linear characteristic

C_i = 49 nF
L_i negligibly low

Passive sensors:

For maximum values for commonly occurring external reactances, reference is made to the table. The effective internal capacitance C_i of the measuring circuit has already been taken into consideration.

(acc. to Ispark 6.2)

IIC		**IIB / IIIC**	
L_o / mH	C_o / µF	L_o / mH	C_o / µF
5	1.65	5	8.85

Active sensors

With the following maximum values:

U_o = 1.2 V
I_o = 50 mA
P_o = 60 mW

For maximum values for commonly occurring external reactances, reference is made to the table. The effective internal capacitance C_i of the measuring circuit has already been taken into consideration.

(acc. to Ispark 6.2)

IIC		**IIB / IIIC**	
L_o / mH	C_o / µF	L_o / mH	C_o / µF
5	1.15	5	6.35

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

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Display / Service interface

(plug connector)

TTH*, TTF*****

Type of protection Intrinsic Safety Ex ia IIB/IIC or Ex ib IIB/IIC

Maximum values:

U_o = 6.2 V
I_o = 65.2 mA
P_o = 101 mW

Linear characteristic

C_i negligibly low
L_i negligibly low

For maximum values for commonly occurring external reactances, reference is made to the table.

(acc. to Ispark 6.2)

IIC		IIB	
L_o / mH	C_o / µF	L_o / mH	C_o / µF
5	1.4	5	8.9

TTR*

Type of protection Intrinsic Safety Ex ia IIB/IIC or Ex ib IIB/IIC

Maximum values:

U_o = 6.2 V
I_o = 65.2 mA
P_o = 101 mW

Linear characteristic

C_i = 30 nF
L_i negligibly low

For maximum values for commonly occurring external reactances, reference is made to the table. The effective internal capacity C_i of the display / service interface has already been taken into consideration.

(acc. to Ispark 6.2)

IIC		IIB	
L_o / mH	C_o / µF	L_o / mH	C_o / µF
5	1.37	5	8.87

Electrical data in the types of protection Increased Safety or Non-sparking device

The device is completely designed as a category 3 equipment in types of protection Increased Safety "ec" or Non-sparking device "nA". The following electrical maximum values apply to the supply and measuring circuits.

Supply circuit (terminals '+' and '-' or '8+' and '7-')	Type of protection Increased Safety Ex ec IIC resp. Non-sparking device Ex nA IIC Operating voltage (maximum value of rated voltage) U_s = 30 V Nominal fuse current I_s = 32 mA
Measuring circuit (terminals '1', '2', '3', '4' or '1', '2', '3', '4', '5', '6')	Type of protection Increased Safety Ex ec IIC resp. Non-sparking device Ex nA IIC Output values: U_o = 6.5 V I_o = 17.8 mA P_o = 29 mW
Display / Service interface (plug connector)	The display / service interface shall not be used in the type of protection "nA" and "ec".

Special conditions for safe use

1. The service temperature inside the enclosure of the TTFx00 temperature measuring transducer represents the specified permissible ambient temperature. With the installation it shall be ensured that this service temperature cannot be exceeded.
2. Heat-resistant connection cables shall be used if the temperature at the cable entries or inside the enclosure of the TTFx00 temperature measuring transducer is higher than 70°C.
3. 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.
4. For operation as a category 1 equipment or category 2 equipment in type of protection Intrinsic Safety, the temperature transmitter TTHx00 and TTRx00 shall be installed in an enclosure that complies with a minimum degree of protection of IP20 according to EN 60529.
5. 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
6. For installation as a category 3 equipment in types of protection Increased Safety "ec" or Non-sparking device "nA", the enclosure shall provide a minimum degree of protection of IP54 according to EN 60529 and a minimum pollution degree of 2 according to IEC 60664-1.
7. For operation as a category 3 equipment in types of protection Increased Safety "ec" or Non-sparking Device "nA", the connecting cables shall be firmly laid and secured against tensile loads.
8. For the operation as category-3 equipment in type of protection Increased Safety "ec" or Non-sparking Device "nA", a fuse acc. to IEC 60127 having a rated fuse current of 32 mA shall be connected in series to the temperature measuring transducer. The fuse may be accommodated in the associated supply unit or shall be connected in series separately. The rated fuse voltage shall be equal to or higher than 30 V. The breaking capacity of the fuse link shall be equal to or higher than the maximum short-circuit current to be assumed at the place of installation (usually 1500 A).
9. The specified operating voltage U_S = 30 V represents the maximum permissible value of the supplying source acc. to EN IEC 60079-0:2017, clause 3.93. This voltage shall not be exceeded for the operation as category-3 equipment in types of protection “Increased Safety ec or Non-sparking device "nA". Furthermore, a transient overvoltage protection shall be provided. This shall be adjusted to a value of max. 140 % of the operating voltage U_s at the supply terminals of the equipment.

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