IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification Scheme for Explosive Atmospheres

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

Certificate No.: IECEx PTB 11.0095

Issue No: 1

Certificate history:
Issue No. 1 (2017-11-16)
Issue No. 0 (2012-04-02)

Status: **Current**

Date of Issue: **2017-11-16**

Applicant: **Hans Turck GmbH & Co. KG**
Witzlebenstr. 7
45472 Mühlheim
Germany

Equipment: **Excom module, type TI40Ex**

Optional accessory:

Type of Protection: **Intrinsic Safety "i", Protection by Intrinsic Safety "iD"**

Marking:

Ex ib [ia Ga] IIC T4 Gb or Ex ib [ia Ga] IIC T4

[Ex ia Da] IIIC or [Ex ia] IIIC

Approved for issue on behalf of the IECEx Certification Body: Dr.-Ing. F. Lienesch

Position: Department Head "Intrinsic Safety and Safety of Systems"

Signature:
(for printed version)

Date: 16.11.17

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 the Official IECEx Website.

Certificate issued by:

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

Physikalisch-Technische Bundesanstalt
Braunschweig und Berlin

IECEx Certificate of Conformity

Certificate No:	IECEx PTB 11.0095	Issue No: 1
Date of Issue:	**2017-11-16**	Page 2 of 5
Manufacturer:	**Hans Turck GmbH & Co. KG** Witzlebenstr. 7 45472 Mühlheim **Germany**	

Additional Manufacturing location(s):

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 electrical apparatus 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 : 2011 Edition:6.0	Explosive atmospheres - Part 0: General requirements
IEC 60079-11 : 2011 Edition:6.0	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"

*This Certificate **does not** indicate compliance with electrical 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/ExTR11.0106/01

Quality Assessment Report:

DE/PTB/QAR06.0013/04

IECEx Certificate of Conformity

Certificate No: IECEx PTB 11.0095 Issue No: 1

Date of Issue: **2017-11-16**

Schedule

EQUIPMENT:

Equipment and systems covered by this certificate are as follows:

See the attachement of this certificate.

SPECIFIC CONDITIONS OF USE: NO

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DETAILS OF CERTIFICATE CHANGES (for issues 1 and above):

The modifications concern the adaptation to the standards. The internal structure has been adapted. The changes concern the use of alternative components in the electronic circuitry.

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Date of Issue: **2017-11-16** Page 5 of 5

Additional information:

Annex:

COCA110095-01.pdf

Applicant: Hans Turck GmbH & Co.KG
Witzlebenstraße 7, 45472 Mülheim, Germany

Electrical Apparatus: Excom Module, type TI40EX

Description of equipment

The Excom module, type TI40EX is used to record measured temperature values from thermocouples or resistance thermometers or other encoders with defined resistance and DC voltage values and output digital intrinsically safe signals in intrinsically safe signals circuits (CAN bus). It is designed in type of protection Intrinsic Safety "i" and it is intended to be used within the I/O Fieldbus system type excom® with the module subrack, type MT according to PTB 00 ATEX 2194 U.

The excom module, type TI40EX ensures the electrical isolation for the various circuits. These isolate the external measuring circuits from the internal data buses and the internal supply voltage.

The operation of the excom module, type TI40EX inside of an enclosure with a degree protection of at least IP54 is ensured by the application within the I/O Fieldbus system type excom® in potentially explosive atmospheres.

The permissible ambient temperature range is: -20°C up to +60°C

Electrical data

I.) AC-supply circuit

type of protection Intrinsic Safety Ex ib IIC;
only for connection with the module subrack, type MT according PTB 00 ATEX 2194 U
P = 1 W (power consumption)

The intrinsically safe AC-supply circuit is safely electrically isolated from ground and up to a peak value of the nominal voltage of 60V from all other intrinsically safe circuits.

II.) Signal circuit (CAN-BUS)

type of protection Intrinsic Safety Ex ib IIC;
only for connection with the module subrack type MT according PTB 00 ATEX 2194 U

III.) Address encoding

type of protection Intrinsic Safety Ex ib IIC;
only for connection with the module subrack type MT according PTB 00 ATEX 2194 U

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IV.) Measuring circuits

Connection terminals on the module rack type MT:

Channel 1: 11 - 14
Channel 2: 21 - 24
Channel 3: 31 - 34
Channel 4: 41 - 44

type of protection Intrinsic Safety
[Ex ia Ga] IIC/IIB or [Ex ia Da] IIIC
Maximum values per channel:

U_o = 5.5 V

I_o = 25 mA

P_o = 35 mW

Linear characteristic

$C_i \leq 60$ nF

L_i negligibly low

Maximum values for common external reactances (C_i is taken into account):

(the values below correspond to the ISpark program 6.2)

	IIC	IIB
L_o (mH)	C_o (µF)	C_o (µF)
2	2.6	15
1	2.9	17
0.5	3.6	21
0.2	4.5	27

When the measuring circuits are connected to active sensors with the following maximum values per sensor:
type of protection Intrinsic Safety Ex ia IIC/IIB or Ex ia IIIC according to separate certificate;

U_o = 1.2 V

I_o = 50 mA

P_o = 60 mW

C_i negligibly low

L_i negligibly low

For the interconnection of a channel with an active sensor, the values for the following permissible common external reactances apply (Ci is taken into account):

(the values below correspond to the ISpark program 6.2)

	IIC	IIB
L_o (mH)	C_o (µF)	C_o (µF)
2	1.6	9.8
1	1.9	12
0.5	2.3	14
0.2	3.0	19

The intrinsically safe channels of the measuring circuits are safely electrically isolated from ground and up to a peak value of the nominal voltage of 30V from each other and from intrinsically safe signal circuits (CAN-bus) and the address encoding. In each channel, the inputs for passive and active sensors are electrically interconnected.

The intrinsically safe signal circuits (CAN-BUS) and the address encoding are electrically isolated from earth and electrically interconnected to each other.

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

Certificate No.: IECEx PTB 11.0095

Issue No: 0

Certificate history:
Issue No. 0 (2012-04-02)

Status: **Current**

Date of Issue: **2012-04-02**

Applicant: **Hans Turck GmbH & Co. KG**
Witzlebenstr. 7
45472 Mühlheim
Germany

Equipment: **Excom module, type TI40Ex**
Optional accessory:

Type of Protection: **Intrinsic Safety "i", Protection by Intrinsic Safety "iD"**

Marking: Ex ib [ia Ga] IIC T4 Gb and [Ex ia III C Da] alternatively Ex ib [ia] IIC T4 and [Ex ia IIIC]

Approved for issue on behalf of the IECEx Certification Body: Dr.-Ing. U. Johannsmeyer

Position: Department Head "Intrinsic Safety and Safety of Systems"

Signature:
(for printed version)

Date:

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Braunschweig und Berlin

IECEx Certificate of Conformity

Certificate No: IECEx PTB 11.0095 Issue No: 0

Date of Issue: **2012-04-02** Page 2 of 3

Manufacturer: **Werner Turck GmbH & Co. KG**
Goethestr. 7
58553 Halver
Germany

Additional Manufacturing location(s):

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 electrical apparatus 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 : 2007-10 Edition:5	Explosive atmospheres - Part 0:Equipment - General requirements
IEC 60079-11 : 2006 Edition:5	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
IEC 61241-11 : 2005 Edition:1	Electrical apparatus for use in the presence of combustible dusts - Part 11: Protection by intrinsic safety 'iD'

*This Certificate **does not** indicate compliance with electrical 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/ExTR11.0106/00

Quality Assessment Report:

DE/PTB/QAR06.0012/02

IECEx Certificate of Conformity

Certificate No: IECEx PTB 11.0095 Issue No: 0

Date of Issue: **2012-04-02**

Schedule

EQUIPMENT:

Equipment and systems covered by this certificate are as follows:

General product information:
The 4-channel Excom module, type TI40Ex is used for data logging in combination with sensors, which can be installed in the Ex-zone. These sensors can be thermocouples, resistance thermometers or other sensing components, if defined resistances or direct voltage potentials are measurable.
All Excom modules have to be inserted into the module rack type MT… to guarantee the degree of protection IP20.

For further information see schedule.

SPECIFIC CONDITIONS OF USE: NO

Annex:

C110095_schedule_.pdf

The excom module, type TI40Ex is used for data logging in combination with sensors. thermocouples, resistance thermometers or other sensing components with defined resistance and direct voltage quantities are alternatively connected as sensors. The excom module, type TI40Ex forms part of the fieldbus system *excom* according to the separate examination certificate PTB 00 ATEX 2194 U. The excom module, type TI40Ex can be plugged and operated in the module subrack with backplane of the fieldbus system *excom*. The degree of protection IP20 is safeguarded in combination with the housing of the module subrack.

The permissible range of the ambient temperature is: -20 °C up to +60 °C.

Electrical data

I.) AC-supply circuit

type of protection Intrinsic Safety Ex ib IIC/IIB only for connection to the certified intrinsically safe circuit according to PTB 00 ATEX 2194 U.

Maximum values:

U = 20 V AC (amplitude)
f = 300 kHz … 314 kHz
P = 1 W (power consumption)
C_i negligibly low
L_i negligibly low

The intrinsically safe AC-supply circuit is safely electrically isolated from ground and - up to a peak value of the nominal voltage of 60 V - from all other intrinsically safe circuits.

II.) Signal circuit (CAN-BUS)
(system-internal circuit, no external connection facilities)

III.) Adress encoding
(system-internal circuit, no external connection facilities)

IV.) Measuring circuits
(terminals at the system module subrack for:
channel 1: 11 through 14
channel 2: 21 through 24
channel 3: 31 through 34
channel 4: 41 through 44)

type of protection Intrinsic Safety Ex ia IIC/IIB;
or Ex ia IIIC
Maximum values per channel:
U_o = 5.5 V
I_o = 25 mA
P_o = 35 mW
characteristic: linear
C_i = 60 nF
L_i negligibly low

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Maximum permissible external values for:
(the values below correspond to the calculation program acc. to PTB-report ThEx-10)

L_o (mH)	**IIC** C_o (µF)	**IIB** C_o (µF)
2	2.6	15
1	2.9	17
0.5	3.6	21
0.2	4.5	27

When the measuring circuits are connected to active sensors with the following maximum values per sensor:

U_o = 1.2 V
I_o = 50 mA
P_o = 60 mW
C_i negligibly low
L_i negligibly low

the tabulated maximum permissible values apply for the interconnection of one channel and one sensor:
(the values below correspond to the calculation program acc. to PTB-report ThEx-10)

L_o (mH)	**IIC** C_o (µF)	**IIB** C_o (µF)
2	1.6	9.8
1	1.9	12
0.5	2.3	14
0.2	3.0	19

The intrinsically safe measuring circuits are safely electrically isolated from ground and - up to a peak value of the nominal voltage of 30 V - from each other and from the intrinsically safe signal circuits (CAN-BUS) and the address encoding circuit.
The intrinsically safe signal circuits (CAN-BUS) and the address encoding circuit are electrically interconnected and safely electrically isolated from ground.

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