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 TUN 16.0047X

Issue No: 3

Certificate history:
Issue No. 3 (2019-01-29)
Issue No. 2 (2017-12-08)
Issue No. 1 (2017-09-19)
Issue No. 0 (2017-02-20)

Status: **Current**

Date of Issue: **2019-01-29**

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

Equipment: **Frequency transducer type IMX12-FI**-*SF-**(**)-C*(*)/24VDC(/**)**

Optional accessory:

Type of Protection: **Intrinsic safety, increased safety, type of protection "n"**

Marking:

[Ex ia Ga] IIC

[Ex ia Da] IIIC

Ex ec [ia Ga] IIC T4 Gc

Ex ec nC [ia Ga] IIC T4 Gc

and see attachment of issue no. 0 of this certificate for further markings.

Approved for issue on behalf of the IECEx Certification Body: Andreas Meyer

Position: Head of IECEx Certification Body

Signature:
(for printed version)

Date: 2019-01-29

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:

TÜV NORD CERT GmbH
Hanover Office
Am TÜV 1, 30519 Hannover
Germany

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Manufacturer:

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

Additional Manufacturing location(s):

Werner Turck GmbH & Co. KG
Goethestraße 7
58553 Halver
Germany

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 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"
IEC 60079-15 : 2010 Edition:4	Explosive atmospheres - Part 15: Equipment protection by type of protection "n"
IEC 60079-7 : 2015 Edition:5.0	Explosive atmospheres – Part 7: Equipment protection by increased safety "e"

*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/TUN/ExTR16.0066/03

Quality Assessment Report:

DE/PTB/QAR06.0012/04 DE/PTB/QAR06.0013/05

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Schedule

EQUIPMENT:

Equipment and systems covered by this certificate are as follows:

The frequency transducer type IMX12-FI**-*SF-**(**)-C*(*)/24VDC(/ * *) is used for monitoring and evaluation of frequencies, rotation speeds and pulse trains as well as for the safe galvanic separation between the intrinsically safe measuring circuits and all non intrinsically safe circuits.

The device is executed with 1 or 2 channels.

The permissible ambient temperature range is -25 °C ... 70 °C.

Changes:

For each of the both measuring circuits, also new electrical data are valid.

See See attachment for further details.

SPECIFIC CONDITIONS OF USE: YES as shown below:

Special conditions for safe use" (only for zone 2 applications)

1. According to IEC 60079-7:2015, section 4.10.1, the following is valid for this apparatus:

The apparatus has to be mounted in a housing tested according to IEC 60079-0, that meets the requirements of degree of protection IP54.

The apparatus may be installed in an area of not more than pollution degree 2.

2. The connecting and disconnecting of energized non intrinsically safe circuits and the operation of the switches for parametrizing is only permitted, if no explosion hazardous atmosphere is available.

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

Annex:

attachment_issue3 TUN 16.0047 X IMX12_FI.pdf

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Product:

The frequency transducer type IMX12-FI**-*SF-**(**)-(C)*(*)/24VDC(/**) is used for monitoring and evaluation of frequencies, rotation speeds and pulse trains as well as for the safe galvanic separation between the intrinsically safe measuring circuits and all non intrinsically safe circuits.

The device is executed with 1 or 2 channels.
1 channel version: IMX12-FI**-1SF-(1I)1R-(C)*(*)/24VDC(/**)
2 channel version: IMX12-FI**-2SF-2I-C*(*)/24VDC(/**)

The permissible ambient temperature range is -25°C ... 70°C.

Additional permissible marking:
[Ex ia] IIC
[Ex ia] IIIC
Ex ec [ia] IIC T4
Ex ec nCc [ia] IIC T4

Ex ec [ia IIIC Da] IIC T4 Gc
Ex ec nC [ia IIIC Da] IIC T4 Gc

Ex ec [ia IIIC] IIC T4
Ex ec nCc [ia IIIC] IIC T4

Electrical Data

All types

Supply circuit	U = 10 ... 30 V d. c., ca. 3 W
(X11-contacts 15[+], 16[-]	U_m = 253 V a. c. / d. c.
or X30-contacts 4[+], 5[-])	

If available

Failure signal output	U = 30 V d. c., 100 mA; potential free contact
(X30-contacts 1, 2)	U_m = 253 V a. c. / d. c.

IMX12-FI-2SF-2I-C*(*)/24VDC(/**)**

Front side jack socket	for connection to a serial interface RS232
	U_m = 253 V a. c. / d. c.

IMX12-FI-*SF-2I-C*(*)/24VDC(/**)**

Current output circuits	U_ = 22 V (max. 30 V)
(X13-contacts 11[+], 12[-]	4...20 mA
(X14-contacts 9[+], 10[-])	U_m = 253 V a. c. / d. c.

IMX12-FI-1SF-1I1R-C*(*)/24VDC(/**)**

Current output circuit	U_ = 22 V (max. 30 V)
(X14-contacts 9[+], 10[-])	4...20 mA
	U_m = 253 V a. c. / d. c.
Relay output	U = 250 V a. c., I = 2 A; S = 500 VA
(X12-contacts 13, 14)	U = 125 V d. c., I = 0.5 A resp.
	U = 30 V d. c., I = 2 A; P = 60 W

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IMX12-FI-1SF-1R-(C)*(*)/24VDC(/**)**

Relay output	U = 250 V a. c., I = 2 A; S = 500 VA
(X13 N/O contacts 11, 12	U = 125 V d. c., I = 0.5 A resp.
X13 N/C contact 12	U = 30 V d. c., I = 2 A; P = 60 W
X14 N/C contact 10)	

IMX12-FI-1SF-1I1R-C*(*)/24VDC(/**)**

SUD (Start Up Delay) signal input	High >10 V, Low <3 V
(X13-contacts 11[+], 12[-])	U_m = 253 V a. c. / d. c.

IMX12-FI-1SF-1R-(C)*(*)/24VDC(/**)**

SUD (Start Up Delay) signal input	High >10 V, Low <3 V
(X12-contacts 13[+], 14[-])	U_m = 253 V a. c. / d. c.

All versions

Measuring circuits	in type of protection
(Channel 1:	Intrinsic Safety Ex ia IIC/IIB resp. Ex ia IIIC
X23-contacts 5[+], 6[-]	Maximum values:
Channel 2:	U_o = 9.3 V
X24-contacts7[+], 8[-])	I_o = 21.1 mA (cummulative value at X23/X24)
	P_o = 49 mW (cummulative value at X23/X24)
	Characteristic line: linear
	The effective internal capacitance is negligibly small.
	Effective internal inductance: 0.3 mH

Table 1a

Ex ia	IIC			IIB / IIIC		
max. permissible external inductance	0.7 mH	4.7 mH	9.7 mH	0.7 mH	9.7 mH	19.7 mH
max. permissible external capacitance	1.2 µF	0.84 µF	0.73 µF	6.6 µF	3.9 µF	3.4 µF

The maximum values of the table 1 are also allowed to be used up to the permissible limits as concentrated capacitances and as concentrated inductances.

Table 2a

Ex ia	IIC	IIB / IIIC
max. permissible external inductance	80 mH	80 mH
max. permissible external capacitance	4.1 µF	31 µF

The maximum values of the table 2a are only allowed to be used up to the permissible limits as cable reactances.

Tables 1a and 2a:
The values for IIC are also permissible for explosive dust atmospheres.
The values for IIB and for IIC are the cumulative values at the connectors X23 and X24.

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All versions

Measuring circuits	in type of protection
(Channel 1:	Intrinsic Safety Ex ia IIC/IIB resp. Ex ia IIIC
X23-contacts 5[+], 6[-]	Maximum values for each of the measuring circuits:
Channel 2:	U_o = 9.3 V
X24-contacts7[+], 8[-])	I_o = 10.5 mA
	P_o = 24.5 mW
	Characteristic line: linear
	The effective internal capacitance is negligibly small.
	Effective internal inductance: 0.15 mH

Table 1b

Ex ia	IIC			IIB / IIIC		
max. permissible external inductance	1.85 mH	4.8 mH	9.8 mH	9.8 mH	19.8 mH	48.8 mH
max. permissible external capacitance	1 µF	0.89 µF	0.79 µF	4 µF	3.6 µF	3.1 µF

The maximum values of the table 1b are also allowed to be used up to the permissible limits as concentrated capacitances and as concentrated inductances.

Table 2b

Ex ia	IIC	IIB / IIIC
max. permissible external inductance	100 mH	100 mH
max. permissible external capacitance	4.1 µF	31 µF

The maximum values of the table 2b are only allowed to be used up to the permissible limits as cable reactances.

Tables 1b and 2b:
The values for IIC are also permissible for explosive dust atmospheres.

The intrinsically safe measuring circuits are safely galvanically separated from the non intrinsically safe circuits up to the peak value of the voltage of 375 V.

Changes:

-New type of the frequency transducer with 8 rotary coding switches for parametrizing (not via computer).
-New type designation for this type with only 1 channel: **IMX12-FI**-1SF-(1I)1R-(C)*(*)/24VDC(/**)**
-New pc board
-New housing with holes for operating the switches for parametrizing
-Change of "Special Conditions for safe use": The connecting and disconnecting of energized non intrinsically safe circuits and the operation of the switches for parametrizing is only permitted, if no explosion hazardous atmosphere is available.

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Special conditions for safe use (only for zone 2 applications)

1. According to IEC 60079-7:2015, section 4.10.1, the following is valid for this apparatus:
   The apparatus has to be mounted in a housing tested according to IEC 60079-0, that meets the requirements of degree of protection IP54.
   The apparatus may be installed in an area of not more than pollution degree 2.

2. The connecting and disconnecting of energized non intrinsically safe circuits is only permitted, if no explosion hazardous atmosphere is available.