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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 IBE 08.0001X

Issue No: 4

Certificate history:
Issue No. 4 (2018-01-30)
Issue No. 3 (2017-08-24)
Issue No. 2 (2016-04-14)
Issue No. 1 (2012-07-27)
Issue No. 0 (2008-05-08)

Status: **Current**

Date of Issue: **2018-01-30**

Applicant: **PHOENIX CONTACT GmbH & Co. KG**
Flachsmarktstraße 8
32825 Blomberg
Germany

Equipment: **NAMUR Isolating Amplifier MACX MCR-EX-SL-***

Optional accessory:

Type of Protection: **Intrinsic Safety, Type 'n'**

Marking:

[Ex ia Ga] IIC
[Ex ia Da] IIIC
Ex nA nC [ia Ga] IIC T4 Gc

Approved for issue on behalf of the IECEx Certification Body: Dipl.-Ing. Alexander Henker

Position: Deputy Head of Certification Body

Signature:
(for printed version)

A. Henker

Date: 2018-01-30

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:

IBExU Institut für Sicherheitstechnik GmbH
Certification Body
Fuchsmühlenweg 7
09599 Freiberg
Germany

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Manufacturer:	**PHOENIX CONTACT Electronics GmbH** Dringenauer Straße 30 31821 Bad Pyrmont **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"
IEC 60079-15 : 2010 Edition:4	Explosive atmospheres - Part 15: Equipment protection by type of protection "n"

*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/IBE/ExTR08.0001/00 DE/IBE/ExTR08.0001/01 DE/IBE/ExTR08.0001/02
DE/IBE/ExTR08.0001/03 DE/IBE/ExTR08.0001/04

Quality Assessment Report:

NL/DEK/QAR11.0009/05

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Schedule

EQUIPMENT:

Equipment and systems covered by this certificate are as follows:

The NAMUR Isolating Amplifier MACX MCR-EX-SL-* is used for galvanic isolated excitation and signal transmission of NAMUR initiators. The amplifiers are single- or double-channel types. They have intrinsically safe sensor input circuits and are designed for the operation of proximity switches with NAMUR behaviour and switch contacts into the hazardous area (zone 0, 1, 2, 20, 21 or 22). The device itself is installed in the safe area or in the zone 2.
The isolating amplifiers are supplied with a galvanic isolation between input and output circuit and between input and supply circuit. The voltage difference between input and output circuit or supply can be up to 375 V peak according to table 5 of IEC 60079-11 Ed. 6.

Variations: **MACX MCR-EX-SL-NAM-R(-SP)**

Module with a channel for one proximity switch and one relay output

MACX MCR-EX-SL-NAM-2RO(-SP)

Module with a channel for one proximity switch and two independent relay outputs

MACX MCR-EX-SL-2NAM-RO(-SP)

Module with two channels for two proximity switches and one relay output per channel

The technical data are mentioned in the Annex.

SPECIFIC CONDITIONS OF USE: YES as shown below:

- The intrinsically safe circuit and the non-intrinsically safe circuits are galvanically safe separated up to a peak value of 375 V.
- If installed in hazardous areas which require equipment of zone 2, the NAMUR Isolating Amplifiers have to be installed in in a suitable housing fulfilling the requirements of IEC 60079-15 with a degree protection of at least IP 54 according to IEC 60529 or another recognized type of protection according to IEC 60079-0, Clause 1.
- Connecting and disconnecting of non-intrinsically safe circuits are not permitted.

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

Update of intrinsically safe values

Annex:

Annex2IBE08.0001X_04.pdf

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IECEx Certificate of Conformity - Annex

IBExU

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Technical data:

ambient temperature range	T_{amb}	-20 °C up to +60 °C
degree of protection		≥ IP20 (acc. to. EN 60529)
supply current circuit (non-intrinsically safe)		
rated voltage	U_N	19.2 ... 30 V DC
maximum direct voltage	U_m	125 V
maximum effective value of alternating voltage	U_m	253 V

Relay output circuits:
(terminals: 2.1...2.3 / 3.1...3.3)
Maximum switching voltage: 250 V AC (2 A)
30 V DC (2 A)

intrinsically safe output circuit (linear characteristic)

Sensor circuit
(terminals: 4.1 and 4.3
as well as 5.1 and 5.3)

in type of protection Ex ia IIC

U_o	9.6 V
I_o	10 mA
P_o	25 mW
C_i	11 nF
L_i	negligible

For circuits including inductances and capacitances the following has to be observed:
The values for L_o and C_o, mentioned in the certificate are allowed for:

- distributed inductance and capacitance e.g. as in a cable or,
- if the total L_i of the external circuit (excluding the cable) is < 1 % of the L_o value or
- if the total C_i of the external circuit (excluding the cable) is < 1 % of the C_o value.

	Ex ia IIC	Ex ia IIB/IIIC	Ex ia IIA
C_o	3.6 µF	26 µF	210 µF
L_o	300 mH	1000 mH	1000 mH

The values of Lo and Co determined in the certificate shall be reduced to 50 % or taken from the following table if both of the following conditions are met:

- the total L_i of the external circuit (excluding the cable) ≥1 % of the L_o value and
- the total C_i of the external circuit (excluding the cable) ≥1 % of the C_o value.

	Ex ia IIC					Ex ia IIB/IIA, Ex ia IIIC			
C_o	500 nF	570 nF	590 nF	590 nF	590 nF	1 µF	1 µF	1 µF	1 µF
L_o	100 mH	50 mH	5 mH	1 mH	10 µH	100 mH	5 mH	1 mH	10 µH

The reduced capacitance of the external circuit (including cable) shall not be greater than 1 µF for Groups I, IIA, and IIB and 600 nF for Group IIC.

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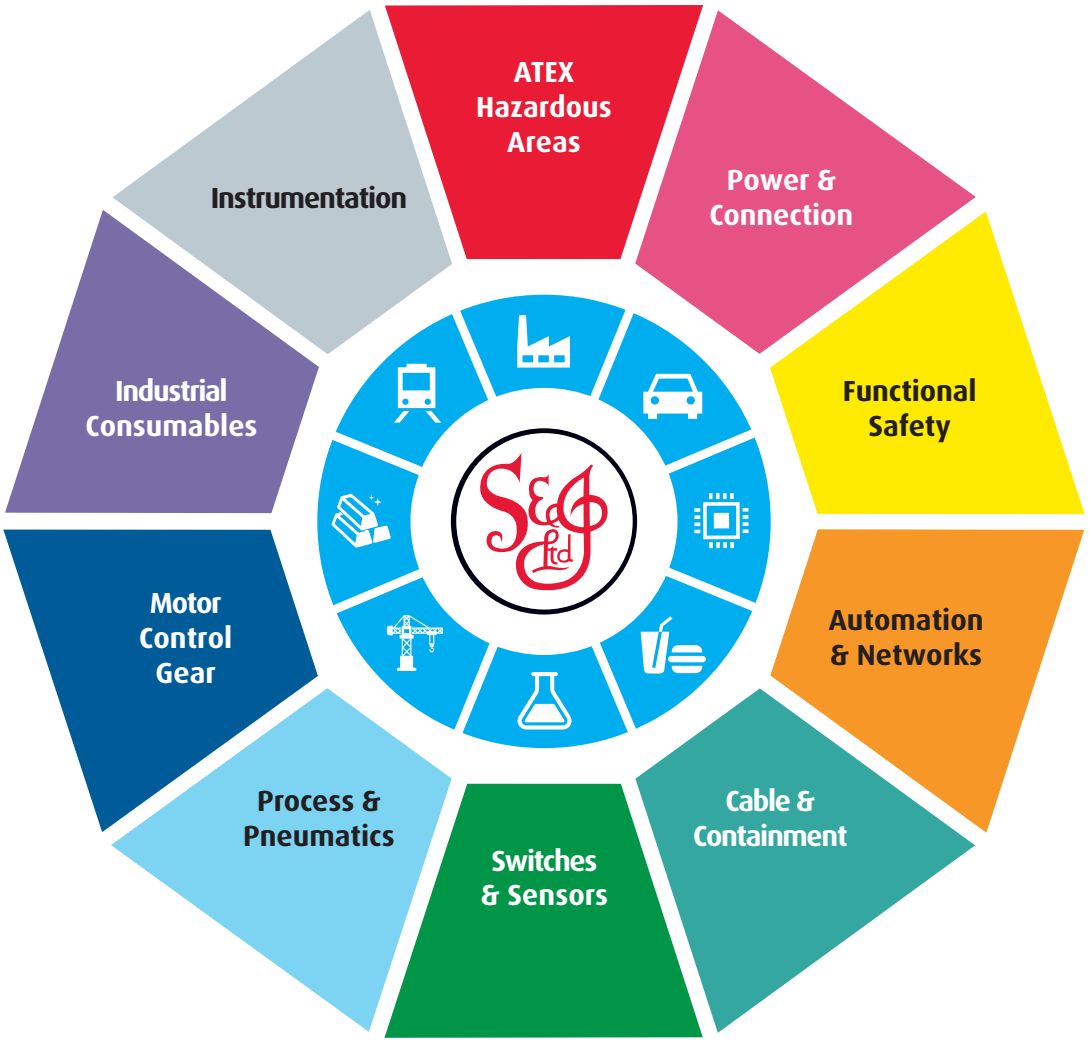

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