



# 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](http://www.iecex.com)

Certificate No.: IECEx IBE 08.0001X

Issue No: 4

Certificate history:

Status: **Current**

Issue No. 4 (2018-01-30)

Issue No. 3 (2017-08-24)

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

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Issue No. 2 (2016-04-14)

Issue No. 1 (2012-07-27)

Issue No. 0 (2008-05-08)

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)*

*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:

<b>IEC 60079-0 : 2011</b> Edition:6.0	Explosive atmospheres - Part 0: General requirements
<b>IEC 60079-11 : 2011</b> Edition:6.0	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
<b>IEC 60079-15 : 2010</b> 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](#)



# IECEX Certificate of Conformity - Annex

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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)
<b>supply current circuit (non-intrinsically safe)</b>		
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 $\mu$ F	26 $\mu$ F	210 $\mu$ F
$L_o$	300 mH	1000 mH	1000 mH

The values of  $L_o$  and  $C_o$  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)  $\geq$  1 % of the  $L_o$  value and
- the total  $C_i$  of the external circuit (excluding the cable)  $\geq$  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 $\mu$ F	1 $\mu$ F	1 $\mu$ F	1 $\mu$ F
$L_o$	100 mH	50 mH	5 mH	1 mH	10 $\mu$ H	100 mH	5 mH	1 mH	10 $\mu$ H

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



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