[1] EU-TYPE EXAMINATION CERTIFICATE - Translation

[2] Equipment or protective systems
intended for use in potentially explosive atmospheres, Directive 2014/34/EU

[3] EU-type examination certificate number **IBExU10ATEX1005 X** | Issue 2

[4] Product: **NAMUR Switch Isolating Amplifier**
Type: MACX ****-EX-SL-xNAM-yR-UP(-SP)***

[5] Manufacturer: PHOENIX CONTACT GmbH & Co. KG

[6] Address: Flachsmarktstraße 8
32825 Blomberg
GERMANY

[7] This product and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

[8] IBExU Institut für Sicherheitstechnik GmbH, notified body number 0637 in accordance with Article 17 of Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014, certifies that this product has been found to comply with the essential health and safety requirements relating to the design and construction of products intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in the confidential test report IB-21-3-0210/2.

[9] Compliance with the essential health and safety requirements has been assured by compliance with:
EN IEC 60079-0:2018, EN IEC 60079-7:2015/A1:2018, EN 60079-11:2012 and
EN IEC 60079-15:2019
except in respect of those requirements listed at item [18] of the schedule.

[10] If the sign "X" is placed after the certificate number, it indicates that the product is subject to the specific conditions of use specified in the schedule to this certificate.

[11] This EU-type examination certificate relates only to the design and construction of the specified product. Further requirements of the Directive apply to the manufacturing process and supply of this product. These are not covered by this certificate.

[12] The marking of the product shall include the following:

Ex I (M1) [Ex ia Ma] I
Ex II (1) G [Ex ia Ga] IIC
Ex II (1) D [Ex ia Da] IIIC
Ex II 3(1) G Ex ec [ia Ga] nC IIC T4 Gc

$-40\ °C \leq T_{amb} \leq +60\ °C / +70\ °C$

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(notified body number 0637)

Certificates without signature and seal are not valid. Certificates may only be duplicated completely and unchanged. In case of dispute, the German text shall prevail.

Freiberg, 2021-12-21

[13] **Schedule**

[14] **Certificate number IBExU10ATEX1005 X** | Issue 2

[15] **Description of product**
The NAMUR Switch Isolating Amplifiers MACX ***-EX-SL-xNAM-yR-UP(-SP)*** are used for the intrinsically safe and galvanically isolated operation of proximity switches with NAMUR behaviour or potential-free switches and resistance-connected switches. They are equipped with a wide voltage range supply. The equipment is provided for installation in zone 2 or in the safe area as associated apparatus. The intrinsically safe signal circuits may be routed into areas that require EPL Ma, Ga (Zone 0) or Da (Zone 20).
The voltage difference between input and output circuit or supply can be up to 375 V peak. The modules are equipped with a circuit for the detection of line faults.

Technical data:

Environmental conditions

Ambient temperature range	-40 °C up to +60 °C -40 °C up to +70 °C (with ≥ 6 mm distance to other devices)
Degree of protection	≥ IP20 (acc. to EN 60529)

Electrical data

1. **Power Supply (1.1 and 1.2) and TBUS**

rated voltage range	U_n	24 ... 230 V DC or AC
supply current	I_n	< 42 mA (24 V DC); max. < 80 mA (20 V AC)
power consumption	P_n	< 1.1 W
maximum r.m.s. or d.c. voltage	U_m	253 V AC / 125 V DC
galvanically separated up to a peak voltage	U_p	375 V

2. **Intrinsically safe sensor circuit (4.1 and 4.3/ 5.1 and 5.3)**

maximum output voltage	U_o	9.56 V
maximum output current	I_o	10.3 mA
maximum output power	P_o	25 mW
characteristic		linear (928 Ω)
effective internal capacity	C_i	negligible
effective internal inductivity	L_i	negligible

3. **Relay output (2.1 and 2.3 / 3.1 and 3.3)**

maximum Switching voltage	U_s	250 V AC (2 A) / 120 V DC (0.2 A) / 30 V DC (2 A)
maximum switching power	P_s	500 VA

Safety instructions:

For circuits including inductances and capacitances the following has to be observed:
The values for L_o and C_o, mentioned in the EU-Type Examination 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 L_o and C_o determined in the EU-Type Examination 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.

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.

	Ex ia IIC					Ex ia IIB/IIA, Ex ia IIIC			
C_o	510 nF	580 nF	600 nF	600 nF	600 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

When using the device at altitudes between 2000 and 5000 m above sea level, the instructions in the operating manual must be observed.

Derating T_{amb}, U_m and $U_{Isolation\ „ec"}$ as elevation above sea level increases:

Height:	T_{amb}:	T_{amb} with Derating*:	U_m:	$U_{Isolation\ „ec"}$:
≤ 2000 m	-40 °C...+60 °C	-40 °C...+70 °C	253 V AC / 125 V DC	265 V
>2000 m ... ≤ 3000 m	-40 °C...+54 °C	-40 °C...+63 °C	190 V AC / 110 V DC	190 V
>3000 m ... ≤ 4000 m	-40 °C...+48 °C	-40 °C...+56 °C	60 V	60 V
>4000 m ... ≤ 5000 m	-40 °C...+42 °C	-40 °C...+49 °C	60 V	60 V

* T_{amb} with derating: With 6mm distance around all sides of the housing and only when mounted vertically (DIN rail horizontally).

Variations compared to issue 1 of this certificate:

Variation 1
The ambient temperature range has been extended to +70 °C.

[16] **Test report**
The test results are recorded in the confidential test report IB-21-3-0210/2 of 2021-12-13.
The test documents are part of the test report and they are listed there.

Summary of the test results
The NAMUR Switch Isolating Amplifiers type MACX ***-EX-SL-xNAM-yR-UP(-SP)*** mentioned under [4] further fulfil the requirements of explosion protection on an associated apparatus for Group I and II and Category M1 and 1G or 1D in type of protection intrinsic safety.
Additionally the NAMUR Switch Isolating Amplifiers fulfil the requirements of explosion protection of an electrical equipment for Equipment Group II and Category 3G in type of protection increased safety in combination with type of protection "n", sealed device "nc" and intrinsic safety.

[17] **Specific conditions of use**

- The NAMUR Switch Isolating Amplifiers MACX ***-EX-SL-xNAM-yR-UP(-SP)*** have to be installed in a certified housing fulfilling the requirements of EN IEC 60079-0 (min. IP54) or another recognized type of protection when installed in Zone 2 (category 3).
- Connecting and disconnecting of non-intrinsically safe circuits are not allowed in energized state in Zone 2.
- The DIP Switches may only be used if no explosive atmosphere is present.

[18] **Essential health and safety requirements**
In addition to the essential health and safety requirements (EHSRs) covered by the standards listed at item [9], the following are considered relevant to this product, and conformity is demonstrated in the test report:

None

[19] **Drawings and Documents**
The documents are listed in the test report.

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Freiberg, 2021-12-21