



[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 **IBExU19ATEX1006 X** | Issue 3

[4] Product: **Temperature Transmitter**
Type: MACX MCR-EX-RTD-I(-SP)(-C)(-...)
MACX MCR-EX-TC-I(-SP)(-C)(-...)
IOA MCR-EX-RTD-I(-C)(-...)
IOA MCR-EX-TC-I(-C)(-...)
IOA MCR-EX-T-I(-C)(-...)

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

[6] Address: Flachsmarkstraße 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-24-3-0124.

[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 and EN 60079-11:2012 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:
For MACX MCR-EX-[RTD,TC]-I(-SP)(-C)(-...) and IOA MCR-EX-[RTD,TC,T]-I(-C)(-...):

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

IBExU Institut für Sicherheitstechnik GmbH
Fuchsmühlenweg 7
09599 Freiberg, GERMANY

By order

Dr.-Ing. P. Cimalla



(notified body number 0637)

Tel: + 49 (0) 37 31 / 38 05 0
Fax: + 49 (0) 37 31 / 38 05 10

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, 2026-01-06

Schedule

Certificate number IBExU19ATEX1006 X | Issue 3

Description of product

The temperature transmitters MACX MCR-Ex-[RTD,TC]-I(-SP)(-C)(-...) and IOA MCR-Ex-[RTD,TC,T]-I(-C)(-...) are galvanically isolated temperature transmitters for use with a standard output signal of 4...20 mA. The temperature transmitters MACX MCR-Ex-[RTD,TC]-I(-SP)(-C)(-...) and IOA MCR-Ex-[RTD,TC,T]-I(-C)(-...) have intrinsically safe inputs. While the temperature transmitters of type MACX MCR-Ex-[RTD,TC]-I(-SP)(-C)(-...) are intended for mounting on 35 mm DIN rails, the temperature transmitters IOA MCR-Ex-[RTD,TC,T]-I(-C)(-...) are designed for connection via a VIP-BASE element

The temperature signal may be provided either by means of resistance elements or thermocouple elements.

The temperature transmitters are supplied with a galvanic isolation between input and output circuit and between input circuit and supply, which is useful for voltages for type MACX MCR-EX-[RTD,TC]-I(-SP)(-C)(-...) up to 265 V_{eff} and for type IOA MCR-EX-[RTD,TC,T]-I(-C)(-...) up to 150 V_{eff}.

Special auxiliaries and accessories may be connected to the modules.

Technical data:

		MACX RTD/TC	IOA RTD/TC	IOA T
ambient temperature range	T _{amb}	-40 °C ... +70 °C		
rated insulation voltage		265 V _{eff} / 375 V _{peak}	150 V _{eff} / 212 V _{peak}	150 V _{eff} / 212 V _{peak}
Terminal 1.1-1.2 / P2+, P2-:				
maximum voltage	U _m	253 V AC / 125 V DC	121 V AC / 121 V DC	121 V AC / 121 V DC
nominal voltage	U _n	24 V DC (19,2 ... 30 V DC)		
Terminal 3.1-3.2 / Chn+, Chn-:				
as associated apparatus	U _m	253 V AC / 125 V DC	121 V AC / 121 V DC	121 V AC / 121 V DC
in zone 2 / EPL Gc	U _{max}	30 V DC		
Terminal 4.1-4.2 / nA, nC; Terminal 5.1-5.2 / nB, nD (Ex ia):				
maximum output voltage	U _o	6 V	6 V	6 V
RTD 4-wire	I _o	16.6 mA	16.6 mA	7.8 mA
RTD 3-wire	I _o	13.0 mA	13.0 mA	4.7 mA
Potentiometer	I _o	13.0 mA	13.0 mA	4.7 mA
RTD 2-wire	I _o	7.1 mA	7.1 mA	2.9 mA
TC + external CJC	I _o	16.8 mA	16.8 mA	7.9 mA
TC + plugged CJC connector	I _o	7.1 mA	7.1 mA	2.9 mA
mV input	I _o	4.3 mA	4.3 mA	3.4 mA
RTD 2x2 wire	I _o	16.6 mA	16.6 mA	7.8 mA
maximum output power	P _o	25.2 mW (linear, max.)	25.2 mW (linear, max.)	11.8 mW (linear, max.)
effective internal capacitance	C _i	44 nF		
effective internal inductance	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 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.

Terminal 4.1-4.2, 5.1-5.2 / nA, nC, nB, nD:

	Ex ia IIC	Ex ia IIB/IIC	Ex ia IIA, Ex ia I
C_o	40 μF	1000 μF	1000 μF
L_o	100 mH	460 mH	850 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) $\geq 1\%$ of the L_o value and
- the total C_i of the external circuit (excluding the cable) $\geq 1\%$ of the C_o value.

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.

Terminal 4.1-4.2, 5.1-5.2 / nA, nC, nB, nD:

	Ex ia IIC	Ex ia IIB/IIA, Ex ia IIIC, Ex ia I
C_o	600 nF	1 μF
L_o	100 mH	100 mH

If using the device in altitudes between 2000 m and 5000 m above sea level the advices for derating from the instructions have to be taken into account.

Derating T_{amb} , U_m and $U_{isolation}$ according to IEC 61131-2:2017 and IEC 61010-1:2010 as elevation above sea level increases for type **MACX**:

Altitude:	T_{amb} :	U_m :	$U_{isolation}$:
≤ 2000 m	-40 °C ... +70 °C	253 V AC / 125 V DC	375 V_{peak} / 300 V_{eff}
> 2000 m ... ≤ 3000 m	-40 °C ... +63 °C	190 V AC / 110 V DC	190 V
> 3000 m ... ≤ 4000 m	-40 °C ... +56 °C	60 V	60 V
> 4000 m ... ≤ 5000 m	-40 °C ... +49 °C	60 V	60 V

Derating T_{amb} , U_m and $U_{isolation}$ according to IEC 61131-2:2017 and IEC 61010-1:2010 as elevation above sea level increases for type **IOA**:

Altitude:	T_{amb} :	U_m :	$U_{isolation}$:
≤ 2000 m	-40 °C ... +70 °C	121 V AC / 121 V DC	212 V_{peak} / 150 V_{eff}
> 2000 m ... ≤ 3000 m	-40 °C ... +63 °C	121 V AC / 121 V DC	212 V_{peak} / 150 V_{eff}
> 3000 m ... ≤ 4000 m	-40 °C ... +56 °C	121 V AC / 121 V DC	212 V_{peak} / 150 V_{eff}
> 4000 m ... ≤ 5000 m	-40 °C ... +49 °C	33 V AC / 33 V DC	89 V_{peak} / 63 V_{eff}

Variations compared to issue 2 of this EU-type examination certificate:

Variation 1

Add of the two new types IOA MCR-EX-T-I.

Variation 2

The temperature range at an altitude ≥ 2000 m (≤ 80 kPa) has been adjusted.

Variation 3

U_m was reduced for IOA MCR-EX*** types.

Variation 4

The rated isolating voltage has been changed.

Variation 5

The intrinsic safety capability of the μUSB configuration interface was removed.

[16] Test report

The test results are recorded in the confidential test report IB-24-3-0124 of 2025-12-12.
The test documents are part of the test report and they are listed there.

Summary of the test results

The temperature transmitter mentioned under [4] fulfils the requirements of explosion protection on an associated apparatus for Equipment Group I, Category M1 as well as Group II and Category 1 G and 1 D in type of protection intrinsic safety.

[17] Specific conditions of use

- The temperature signal conditioner type IOA MCR-EX-... with type of protection "ia" must only be used in circuits with overvoltage category I or II in accordance with IEC 60664-1, and must be mounted in a suitable enclosure, which complies with the requirements of EN IEC 60079-0 and provides a degree of protection not less than IP54. As an alternative to the IP54 enclosure, the type IOA MCR-EX-... is restricted to installation and use in environments providing pollution degree 2 or better according to IEC 60664-1.
- When the temperature signal conditioners type MACX... and type IOA... are installed in Zone 2 applying type of protection "ec", the pollution level shall be limited to pollution degree 2 or better as defined in IEC 60664-1, and the modules must be mounted in a suitable enclosure which complies with the requirements of EN IEC 60079-0 and provides a degree of protection not less than IP54. Furthermore, the clearance and creepage distances requirements of EN IEC 60079-7 must be observed.
- The permitted ambient temperature range is -40 °C...+70 °C.
- Detailed information for the intrinsically safe parameter are mentioned in the installation notes.
- The µUSB programming interface must not be connected, disconnected or used in potentially explosive atmospheres.
- Connecting and disconnecting of non-intrinsically safe circuits in Zone 2 is only permitted in a de-energized state or when no potentially 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:

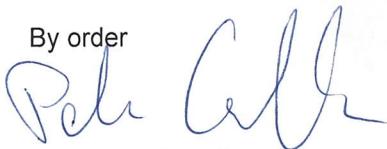
Altitude correction factors according to IEC 61131-2:2017 and IEC 61010-1:2010

[19] Drawings and Documents

The documents are listed in the test report.

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