



IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION IEC Certification System for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.:	IECEx BVS 08.0016X	Page 1 of 4	<u>Certificate history:</u>
Status:	Current	Issue No: 6	Issue 5 (2021-10-04)
Date of Issue:	2022-03-22		Issue 4 (2017-09-11)
Applicant:	PHOENIX CONTACT GmbH & Co. KG Flachsmarktstraße 8 32825 Blomberg Germany		Issue 3 (2014-05-12)
Equipment:	Repeater Power Supply and Input Isolating Amplifier types MACX MCR-EX-SL-RPSSI-I*** MACX MCR-EX-SL-RPSSI-I-SP*** IOA MCR-EX-RPSS*** MACX MCR-SL-RPSSI-I*** MACX MCR-SL-RPSSI-I-SP*** IOA MCR-RPSS***		Issue 2 (2010-10-11)
Optional accessory:			Issue 1 (2009-11-06)
Type of Protection:	Intrinsic Safety "i", Increased Safety "e"		Issue 0 (2008-05-26)
Marking:	MACX MCR-EX-SL-RPSSI-I*** MACX MCR-EX-SL-RPSSI-I-SP*** IOA MCR-EX-RPSS*** [Ex ia Ma] I [Ex ia Ga] IIC [Ex ia Da] IIIC Ex ec [ia Ga] IIC T4 Gc MACX MCR-SL-RPSSI-I*** MACX MCR-SL-RPSSI-I-SP*** IOA MCR-RPSS*** Ex ec IIC T4 Gc		

Approved for issue on behalf of the IECEx
Certification Body:

Dr Franz Eickhoff

Position:

Lead Auditor and officially recognised expert

Signature:
(for printed version)

Date:
(for printed version)

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DEKRA Testing and Certification GmbH
Certification Body
Dinnendahlstrasse 9
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Germany

 **DEKRA**
On the safe side.



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

Manufacturing
locations: **PHOENIX CONTACT GmbH & Co.
KG**
Flachsmarktstraße 8
32825 Blomberg
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 equipment 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 60079-0:2017](#) Explosive atmospheres - Part 0: Equipment - General requirements
Edition:7.0

[IEC 60079-11:2011](#) Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
Edition:6.0

[IEC 60079-7:2017](#) Explosive atmospheres - Part 7: Equipment protection by increased safety "e"
Edition:5.1

This Certificate **does not** indicate compliance with 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/BVS/ExTR08.0019/06](#)

Quality Assessment Report:

[NL/DEK/QAR11.0009/08](#)



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EQUIPMENT:

Equipment and systems covered by this Certificate are as follows:

Types:

MACX MCR-EX-SL-RPSSI-I***

MACX MCR-SL-RPSSI-I***

MACX MCR-EX-SL-RPSSI-I-SP***

MACX MCR-SL-RPSSI-I-SP***

Types with the ending -SP: Spring pressure plug instead of screw. The placeholder *** are not Ex relevant.

IOA MCR-EX-RPSS***

IOA MCR-RPSS***

The types with ...-EX... are associated equipment with intrinsically safe circuits.

General product information

The Repeater Power Supply and Input Isolating Amplifiers are designed for the operation of passive 2-wire transmitters as well as for the connection of active mA current sources (4-wire transmitters). 2-wire transmitters are supplied with power via an active input. 4-wire transmitters or mA current sources can be operated via a passive input. The analogue 0/4...20 measured values are transmitted 1:1 from the input to the output terminals.

Digital (HART) communication signals superimposed on the 4-20 mA signal are transmitted bidirectionally.

The signal circuits are galvanically isolated from each other and from the auxiliary power supply circuit. The intrinsically safe circuits type of protection Ex ia can be led into areas which require EPL Ma, EPL Ga or EPL Da equipment.

While the MACX MCR*** are designed to snap onto a 35 mm top-hat rail, optionally with the TBUS power supply system, the IOA MCR are designed for connection via a VIP/.../-BASE element.

Ratings

See Annex

SPECIFIC CONDITIONS OF USE: YES as shown below:

For all types:

For the installation of the Smart Repeater in areas where EPL Gc (Zone 2) equipment is required, it has to be mounted in enclosures which are in accordance with IEC 60079-7.

For Type IOA MCR-EX-RPSS***:

The device has to be installed in an environment fulfilling overvoltage Category I/II and pollution degree II. The device has to be installed in an enclosure with minimum IP54 in accordance with EN IEC 60079-0.

If the device is installed outside of a hazardous area installation inside an environment fulfilling pollution degree II, instead of installation in an enclosure with IP54 in accordance with IEC 60079-0 is sufficient.

For Type MACX MCR-EX-RPSS***:

The temperature range differs depending on the installation; refer to the parameters.



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DETAILS OF CERTIFICATE CHANGES (for issues 1 and above)

Higher permitted ambient temperatures are added for types MACX MCR-EX-SL-RPSSI-I and MACX MCR-EX-SL-RPSSI-I-SP

Annex:

[BVS_08_0016X_Phoenix_Annex_issue6_1.pdf](#)



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Parameters:

- 1 Types: MACX MCR-SL-RPSSI-I*** and MACX MCR- SL-RPSSI-I-SP*** (terminals 1.1 – 1.2, TBUS)

Nominal voltage	U_n	DC	24 V
Nominal power	P_n		1800 mW

- 2 Types: MACX MCR-EX-SL-RPSSI-I*** and MACX MCR-EX-SL-RPSSI-I-SP***
 - 2.1 Non-intrinsically safe power supply circuit (terminals 1.1 – 1.2, TBUS)

Nominal voltage	U_n	DC	24 V
Nominal power	P_n		1800 mW
Maximum voltage	U_m		
≤ 2000 m above sea level		AC	253 V
		DC	125 V
> 2000 m ≤ 3000 m above sea level		AC	190 V
		DC	110 V
> 3000 m ≤ 5000 m above sea level		AC	60 V
		DC	60 V

 - 2.2 Non-intrinsically safe signal circuits (terminals 2.1 – 2.2 and 3.1 – 3.2)

Nominal signal			0(4) ... 20 mA
Maximum voltage	U_m	AC	253 V
		DC	125 V

 - 2.3 Intrinsically safe circuits
The intrinsically safe circuits are galvanically isolated from the non-intrinsically safe circuits and from earth.

 - 2.3.1 Intrinsically safe output circuit (terminals 4.1 – 4.2)

Maximum output voltage	U_o	DC	25.2V
Maximum output current	I_o		93 mA
Maximum output power	P_o		587 mW

Maximum external inductivity and capacity with separated connection of C_o or L_o , see table:

	Group IIB	Group IIC	IIA	I
C_o	820 nF	107 nF	2.9 μ F	4.8 μ F
L_o	14 mH	3 mH	26 mH	40 mH

Maximum external inductivity and capacity if concentrated C_o and L_o are connected, see tables:

For Group IIA

C_o	470 nF	570 nF	630 nF	720 nF	1.1 μ F	2.9 μ F
L_o	26 mH	20 mH	1 mH	0.5 mH	0.1 mH	0.005 mH



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For Group IIB / III

C _o	370 nF	510 nF	660 nF	820 nF
L _o	16 mH	500 µH	200 µH	100 µH

For Group IIC

C _o	47 nF	49 nF	63 nF	80 nF	107 nF
L _o	2.2 mH	2 mH	1 mH	500 µH	200 µH

For Group I

C _o	0.54 µF	1 µF	2.9 µF	4.15 µF
L _o	37 mH	0.35 mH	0.009 mH	1 nH

2.3.2 Intrinsically safe input circuit (terminals 5.1 – 5.2)

Maximum input voltage	U _i	DC	30 V
Maximum input current	I _i		150 mA
Maximum internal capacitance	C _i		negligible
Maximum internal inductance	L _i		negligible

3 Type: IOA MCR-RPSS***

Non-intrinsically safe power supply circuit (Port 10/11)

Nominal voltage	U _n	DC	24 V
Nominal power	P _n		1800 mW

4 Type: IOA MCR-EX-RPSS***

4.1 Non-intrinsically safe power supply circuit (Port 10/11)

Nominal voltage	U _n	DC	24 V
Nominal power	P _n		1800 mW

Maximum voltage	U _m		
≤ 2000 m above sea level		AC	253 V
		DC	125 V
> 2000 m ≤ 3000 m above sea level		AC	190 V
		DC	110 V
> 3000 m ≤ 5000 m above sea level		AC	60 V
		DC	60 V

4.2 Non-intrinsically safe signal circuits (Port 5/6)

Nominal signal			0(4) ... 20 mA
Maximum voltage	U _m		
≤ 2000 m above sea level		AC	253 V
		DC	125 V
> 2000 m ≤ 3000 m above sea level		AC	190 V
		DC	110 V
> 3000 m ≤ 5000 m above sea level		AC	60 V
		DC	60 V

4.3 Intrinsically safe circuits



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The intrinsically safe circuits are galvanically isolated from the non-intrinsically safe circuits and from earth.

4.3.1	Intrinsically safe output circuit (Port 15/18)			
	Maximum output voltage	U_o	DC	25.2 V
	Maximum output current	I_o		93 mA
	Maximum output power	P_o		587 mW

Maximum external inductivity and capacity with separated connection of C_o or L_o , see table:

	Group IIB	Group IIC	IIA	I
C_o	817 nF	104 nF	2.9 μ F	4.8 μ F
L_o	14 mH	3 mH	26 mH	40 mH

Maximum external inductivity and capacity if concentrated C_o and L_o are connected, see tables:

For Group IIA

C_o	467 nF	567 nF	627 nF	717 nF	1.1 μ F	2.9 μ F
L_o	26 mH	20 mH	1 mH	0.5 mH	0.1 mH	0.005 mH

For Group IIB / III

C_o	367 nF	507 nF	657 nF	817 nF
L_o	16 mH	500 μ H	200 μ H	100 μ H

For Group IIC

C_o	44 nF	46 nF	60 nF	77 nF	104 nF
L_o	2.2 mH	2 mH	1 mH	500 μ H	200 μ H

For Group I

C_o	537 nF	1 μ F	2.9 μ F	4.15 μ F
L_o	37 mH	0.35 mH	0.009 mH	1 nH

4.3.2	Intrinsically safe input circuit (Port 19/22)			
	Maximum input voltage	U_i	DC	30 V
	Maximum input current	I_i		150 mA
	Maximum internal capacitance	C_i		negligible
	Maximum internal inductance	L_i		negligible

5 Ambient temperature range

Types: MACX MCR-EX-SL-RPSSI-I*** and MACX MCR-EX-SL-RPSSI-I-SP***

≤ 2000 m above sea level	$-40\text{ }^{\circ}\text{C} \leq T_a \leq +60\text{ }^{\circ}\text{C}/+70\text{ }^{\circ}\text{C}^*$
> 2000 m ≤ 3000 m above sea level	$-40\text{ }^{\circ}\text{C} \leq T_a \leq +54\text{ }^{\circ}\text{C}/+63\text{ }^{\circ}\text{C}^*$
> 3000 m ≤ 4000 m above sea level	$-40\text{ }^{\circ}\text{C} \leq T_a \leq +48\text{ }^{\circ}\text{C}/+56\text{ }^{\circ}\text{C}^*$
> 4000 m ≤ 5000 m above sea level	$-40\text{ }^{\circ}\text{C} \leq T_a \leq +42\text{ }^{\circ}\text{C}/+49\text{ }^{\circ}\text{C}^*$



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

*Higher ambient temperatures are permitted with a spacing to other devices and separation walls of at least 6 mm around the enclosure.

Types: IOA MCR-EX-RPSS***

≤ 2000 m above sea level

> 2000 m ≤ 3000 m above sea level

> 3000 m ≤ 4000 m above sea level

> 4000 m ≤ 5000 m above sea level

-40 °C ≤ T_a ≤ +70 °C

-40 °C ≤ T_a ≤ +63 °C

-40 °C ≤ T_a ≤ +56 °C

-40 °C ≤ T_a ≤ +49 °C