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 KEM 10.0022X**

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Certificate history:

Issue 4 (2018-04-06)
Issue 3 (2016-08-25)
Issue 2 (2016-07-13)
Issue 1 (2012-07-24)
Issue 0 (2010-03-03)

Status: **Current**

Issue No: 5

Date of Issue: 2022-04-21

Applicant: **PR electronics A/S**
Lerbakken 10
8410 Rønde
Denmark

Equipment: **Universal Converter, Type 9116A1, Type 9116A2, Type 9116B1 and Type 9116B2**

Optional accessory: Display, type 4501

Type of Protection: **Ex ec nC, [Ex ia]**

Marking:

Ex ec nC IIC T4 Gc	(Type 9116A. and 9116B.)
[Ex ia Ga] IIC/IIB/IIA	(Type 9116B.)
[Ex ia Da] IIIC	(Type 9116B.)
[Ex ia Ma] I	(Type 9116B.)

Approved for issue on behalf of the IECEx Certification Body: **R. Schuller**

Position: **Certification Manager**

Signature:
(for printed version)

Date:
(for printed version)

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2. This certificate is not transferable and remains the property of the issuing body.
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Certificate issued by:

DEKRA Certification B.V.
Meander 1051
6825 MJ Arnhem
Netherlands

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Manufacturer: **PR electronics A/S**
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Manufacturing locations: **PR electronics A/S**
Lerbakken 10
8410 Rønde
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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 60079-15:2017 Explosive atmospheres - Part 15: Equipment protection by type of protection "n"
Edition:5.0

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:

NL/KEM/ExTR10.0020/04

Quality Assessment Report:

NL/DEK/QAR13.0017/04

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EQUIPMENT:
Equipment and systems covered by this Certificate are as follows:

Universal Converters, Type 9116A1, Type 9116A2, Type 9116B1 and Type 9116B2, for rail mounting are 24 V powered isolating barriers, interfacing temperature sensors and loop supplied transmitters located in an explosive atmosphere.
The output to safe area is a 0/4 ... 20 mA signal together with a normally open relay contact.
The Universal Converter is supplied via terminals at the front of the module, or via Power Rail Type 9400. Removable display module 4501 can be used for programming of the Converter.

Ambient temperature range -20 °C to +60 °C.

Electrical data:

Refer to Annex.

SPECIFIC CONDITIONS OF USE: YES as shown below:
The Universal Converter shall be installed in a controlled environment with suitably reduced pollution, limited to pollution degree 2 or better.

The non-intrinsically safe circuits may only be connected to an overvoltage category I or II power source, as defined in IEC 60664-1.

If the Universal Converter is installed in an explosive atmosphere where equipment protection level Gc is required, the following conditions of certification additionally apply:

The Universal Converter shall be installed in an enclosure in type of protection Ex e, providing a degree of protection of at least IP54 in accordance with IEC 60079-0. Cable entry devices and blanking elements shall fulfill the same requirements.

Removable Display Module 4501, when connected to the Universal Converter, may not be damaged and shall be free of dust and moisture.

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DETAILS OF CERTIFICATE CHANGES (for issues 1 and above)
assessed per 60079-0 Ed. 7.0
assessed per 60079-7 Ed. 5.1
assessed per 60079-15 Ed. 5.0

Annex:

225761800-ExTR10.0020.04-Annex1_1.pdf

Annex 1 to: Certificate of Conformity IECEx KEM 10.0022 X
Report NL/KEM/ExTR10.0020/04

Description

Universal Converter, Type 9116A1, Type 9116A2, Type 9116B1 and Type 9116B2, for rail mounting are 24 V powered isolating barriers, interfacing temperature sensors and loop supplied transmitters located in an explosive atmosphere.
The output to safe area is a 0/4 ... 20 mA signal together with a normally open relay contact.

The Universal Converter is supplied via terminals at the front of the module, or via Power Rail Type 9400. Removable display module 4501 can be used for programming of the Converter.

Ambient temperature range -20 °C to +60 °C.

Electrical data

If the Universal Converter is installed in an explosive atmosphere where equipment protection level Gc is required, the following electrical data applies:

Supply (terminals 31, 32 and rear contacts): U = 19.2 ... 31.2 Vdc.
Outputs (terminals 11, 12): I = 0/4 ... 20 mA.
Relay output (terminals 13, 14): U ≤ 32 Vac or 30 Vdc, I ≤ 2 Aac or I ≤ 2 Adc respectively.
Status-Relay output (terminals 33, 34): U ≤ 32 Vac or 32 Vdc, I ≤ 0.5 Aac or I ≤ 1 Adc respectively.

For all circuits above: U_m = 253 Vac (max. frequency 400 Hz).

Sensor circuit (terminals 41 ... 44):
in type of protection intrinsic safety Ex ia IIC/IIB/IIA/IIIC/I, with following maximum values:
U_o = 8.3 V; I_o = 13.1 mA; P_o = 27.3 mW; C_o = 7 µF (IIC) or 73 µF (IIB) or 1000 µF (IIA);
L_o = 207 mH (IIC) or 828 mH (IIB) or 1000 mH (IIA);
L_o/R_o = 1 mH/Ω (IIC), 5 mH/Ω (IIB) or 10 mH/Ω (IIA);

Loop supply circuit (terminals 51-54, 52-54):
in type of protection intrinsic safety Ex ia IIC/IIB/IIA/IIIC/I, with following maximum values:
I_o = 93 mA; P_o = 650 mW; L_o = 4 mH (IIC) or 16 mH (IIB) or 32 mH (IIA);
L_o/R_o = 54 µH/Ω (IIC), 218 µH/Ω (IIB) or 436 µH/Ω (IIA);
For Universal Converter, Type 9116.1:
U_o = 28 V; C_o = 80 nF (IIC) or 640 nF (IIB) or 2.1 µF (IIA);
For Universal Converter, Type 9116.2:
U_o = 21.4 V; C_o = 0.16 µF (IIC) or 1.13 µF (IIB) or 4.15 µF (IIA);

Loop input circuit (terminals 51-53):
in type of protection intrinsic safety Ex ia IIC/IIB/IIA/IIIC/I, with following maximum values:
U_i = 30 V; I_i = 120 mA; P_i = 900 mW; C_i = 3 nF; L_i = 1 µH;
I_o = 1.1 mA; P_o = 8 mW; L_o = 1000 mH (all groups);
L_o/R_o = 4 mH/Ω (IIC), 17 mH/Ω (IIB) or 35 mH/Ω (IIA);
For Universal Converter, Type 9116.1:
U_o = 28 V; C_o = 80 nF (IIC) or 640 nF (IIB) or 2.1 µF (IIA);
For Universal Converter, Type 9116.2:
U_o = 21.4 V; C_o = 0.16 µF (IIC) or 1.13 µF (IIB) or 4.15 µF (IIA);
Loop input supply circuit (terminals 51-52):
in type of protection intrinsic safety Ex ia IIC/IIB/IIA/IIIC/I, with following maximum values:
U_i = 30 V; I_i = 120 mA; P_i = 900 mW; C_i = 3 nF; L_i = 1 µH;
U_o = 8.3 V; I_o = 0.2 mA; P_o = 0.4 mW; C_o = 7 µF (IIC) or 73 µF (IIB) or 1000 µF (IIA);
L_o = 1000 mH (all groups); L_o/R_o = 100 mH/Ω (IIC), 400 mH/Ω (IIB) or 800 mH/Ω (IIA);

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Report NL/KEM/ExTR10.0020/04

Combination of the loop supply circuit (terminals 52-54) of one Universal Converter with the loop input circuit (terminals 51-52) of a second Universal Converter (where terminal 52 of the first Universal Converter is connected with terminal 51 of the second Universal converter):
in type of protection intrinsic safety Ex ia IIC/IIB/IIA/IIIC/I, with following maximum values:
U_i = 30 V; I_i = 120 mA; P_i = 900 mW; C_i = 3 nF; L_i = 2 µH;
I_o = 93 mA; P_o = 650 mW; L_o = 4 mH (IIC) or 16 mH (IIB) or 32 mH (IIA);
L_o/R_o = 54 µH/Ω (IIC), 218 µH/Ω (IIB) or 436 µH/Ω (IIA);
For Universal Converter, Type 9116.1:
U_o = 28 V; C_o = 80 nF (IIC) or 640 nF (IIB) or 2.1 µF (IIA);
For Universal Converter, Type 9116.2:
U_o = 21.4 V; C_o = 0.16 µF (IIC) or 1.13 µF (IIB) or 4.15 µF (IIA);

Combination of the loop input circuit (terminals 51-52) of one Universal Converter in series with the loop input circuit (terminals 51-52) of a second Universal Converter:
in type of protection intrinsic safety Ex ia IIC/IIB/IIA/IIIC/I, with following maximum values:
U_i = 30 V; I_i = 120 mA; P_i = 900 mW; C_i = 6 nF; L_i = 2 µH;
U_o = 16.6 V; I_o = 0.2 mA; P_o = 0.8 mW; C_o = 0.4 µF (IIC) or 2.3 µF (IIB) or 9.5 µF (IIA);
L_o = 1000 mH (all groups); L_o/R_o = 25 mH/Ω (IIC), 100 mH/Ω (IIB) or 200 mH/Ω (IIA);

For Ex ia IIIC, the parameters of group IIB apply.
For Ex ia I, the parameters of group IIA apply.

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