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

Certificate No.:	IECEx KEM 10.0022X issue No.:1	Certificate history: Issue No. 1 (2012-7-24) Issue No. 0 (2010-3-3)
Status:	**Current**	
Date of Issue:	**2012-07-24**	Page 1 of 4

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

Electrical Apparatus: **Universal Converter, Type 9116B.**
Optional accessory: Display, type 4501

Type of Protection: **Ex i, Ex n**

Marking: Ex nA nC IIC T4 Gc
[Ex ia Ga] IIC/IIB/IIA
[Ex ia Da] IIIC
[Ex ia Ma] I

Approved for issue on behalf of the IECEx Certification Body: C.G. van Es

Position: Certification Manager

Signature:
(for printed version)

Date: 2012-07-24

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:

DEKRA Certification B.V.
Utrechtseweg 310
6812 AR Arnhem
The Netherlands

All testing, inspection, auditing and certification activities of the former KEMA Quality are an integral part of the DEKRA Certification Group.

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

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:

IEC 60079-0 : 2011 Edition: 6.0	Explosive atmospheres - Part 0: General requirements
IEC 60079-11 : 2011-06 Edition: 6.0	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
IEC 60079-15 : 2005-03 Edition: 3	Electrical apparatus for explosive gas atmospheres Part 15: Construction, test and Marking of Type of Protection "n" electrical apparatus
IEC 60079-26 : 2006 Edition: 2	Explosive atmospheres - Part 26: Equipment with equipment protection level (EPL) Ga

*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:
NL/KEM/ExTR10.0020/00 NL/KEM/ExTR10.0020/01

Quality Assessment Report:

NL/KEM/QAR07.0004/03

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Schedule

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

General product information:

Universal Converters, 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 1 to Certificate of Conformity IECEx KEM 10.0022X, Issue 1.pdf".

CONDITIONS OF CERTIFICATION: 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 IEC60664-1.

If the Universal Converter is installed in an explosive atmosphere where equipment protection level Gc is required, the following special conditions for safe use apply:

The Universal Converter shall be installed in an enclosure in type of protection Ex n or Ex e, providing a degree of protection of at least IP54. 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):

- application of annex F of the IEC60079-11: 2011. As a result, the fuse does not need to be encapsulated in a plastic box anymore, and therefore the PCB-layout changed
- assessment for mines susceptible to firedamp
- upgrade to the IEC60079-0: 2011 and IEC60079-11: 2011

Annexe: Annex 1 to Certificate of Conformity IECEx KEM 10.0022X, issue 1.pdf

Annex 1 to Certificate of Conformity IECEx KEM 10.0022 X, Issue 01

Electrical data

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.
If the Universal Converter is installed outside the hazardous area, the following data for the Relay output apply: U ≤ 30 Vdc or 250 Vac, I ≤ 2 Adc or I ≤ 2 Aac respectively.

Status-Relay output (terminals 33, 34): U ≤ 32 Vac or 32 Vdc, I ≤ 0.5 Aac or I ≤ 1 Adc respectively.
If the Universal Converter is installed outside the hazardous area, the following data for the relay contacts apply: U ≤ 110 Vdc or 125 Vac, I ≤ 0.3 Adc or I ≤ 0.5 Aac 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 9116B1:
U_o = 28 V; C_o = 80 nF (IIC) or 640 nF (IIB) or 2.1 µF (IIA);
For Universal Converter, Type 9116B2:
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 9116B1:
U_o = 28 V; C_o = 80 nF (IIC) or 640 nF (IIB) or 2.1 µF (IIA);
For Universal Converter, Type 9116B2:
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);

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 9116B1:
U_o = 28 V; C_o = 80 nF (IIC) or 640 nF (IIB) or 2.1 µF (IIA);

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For Universal Converter, Type 9116B2:
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.