



# 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](http://www.iecex.com)

Certificate No.:	<b>IECEX KEM 10.0022X</b>	Page 1 of 4	<u>Certificate history:</u>
Status:	<b>Current</b>	Issue No: 5	Issue 4 (2018-04-06)
Date of Issue:	2022-04-21		Issue 3 (2016-08-25)
Applicant:	<b>PR electronics A/S</b> Lerbakken 10 8410 Rønede Denmark		Issue 2 (2016-07-13)
Equipment:	<b>Universal Converter, Type 9116A1, Type 9116A2, Type 9116B1 and Type 9116B2</b>		
Optional accessory:	Display, type 4501		
Type of Protection:	<b>Ex ec nC, [Ex ia]</b>		
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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Netherlands





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

Manufacturing locations: **PR electronics A/S**  
Lerbakken 10  
8410 Rønne  
Denmark

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):  $U = 19.2 \dots 31.2$  Vdc.

Outputs (terminals 11, 12):  $I = 0/4 \dots 20$  mA.

Relay output (terminals 13, 14):  $U \leq 32$  Vac or 30 Vdc,  $I \leq 2$  Aac or  $I \leq 2$  Adc respectively.

Status-Relay output (terminals 33, 34):  $U \leq 32$  Vac or 32 Vdc,  $I \leq 0.5$  Aac or  $I \leq 1$  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;  $C_o = 7$   $\mu$ F (IIC) or 73  $\mu$ F (IIB) or 1000  $\mu$ F (IIA);

$L_o = 207$  mH (IIC) or 828 mH (IIB) or 1000 mH (IIA);

$L_o/R_o = 1$  mH/ $\Omega$  (IIC), 5 mH/ $\Omega$  (IIB) or 10 mH/ $\Omega$  (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);

$L_o/R_o = 54$   $\mu$ H/ $\Omega$  (IIC), 218  $\mu$ H/ $\Omega$  (IIB) or 436  $\mu$ H/ $\Omega$  (IIA);

For Universal Converter, Type 9116.1:

$U_o = 28$  V;  $C_o = 80$  nF (IIC) or 640 nF (IIB) or 2.1  $\mu$ F (IIA);

For Universal Converter, Type 9116.2:

$U_o = 21.4$  V;  $C_o = 0.16$   $\mu$ F (IIC) or 1.13  $\mu$ F (IIB) or 4.15  $\mu$ F (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;  $L_i = 1$   $\mu$ H;

$I_o = 1.1$  mA;  $P_o = 8$  mW;  $L_o = 1000$  mH (all groups);

$L_o/R_o = 4$  mH/ $\Omega$  (IIC), 17 mH/ $\Omega$  (IIB) or 35 mH/ $\Omega$  (IIA);

For Universal Converter, Type 9116.1:

$U_o = 28$  V;  $C_o = 80$  nF (IIC) or 640 nF (IIB) or 2.1  $\mu$ F (IIA);

For Universal Converter, Type 9116.2:

$U_o = 21.4$  V;  $C_o = 0.16$   $\mu$ F (IIC) or 1.13  $\mu$ F (IIB) or 4.15  $\mu$ F (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;  $L_i = 1$   $\mu$ H;

$U_o = 8.3$  V;  $I_o = 0.2$  mA;  $P_o = 0.4$  mW;  $C_o = 7$   $\mu$ F (IIC) or 73  $\mu$ F (IIB) or 1000  $\mu$ F (IIA);

$L_o = 1000$  mH (all groups);  $L_o/R_o = 100$  mH/ $\Omega$  (IIC), 400 mH/ $\Omega$  (IIB) or 800 mH/ $\Omega$  (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:

$U_i = 30 \text{ V}$ ;  $I_i = 120 \text{ mA}$ ;  $P_i = 900 \text{ mW}$ ;  $C_i = 3 \text{ nF}$ ;  $L_i = 2 \text{ }\mu\text{H}$ ;

$I_o = 93 \text{ mA}$ ;  $P_o = 650 \text{ mW}$ ;  $L_o = 4 \text{ mH}$  (IIC) or  $16 \text{ mH}$  (IIB) or  $32 \text{ mH}$  (IIA);

$L_o/R_o = 54 \text{ }\mu\text{H}/\Omega$  (IIC),  $218 \text{ }\mu\text{H}/\Omega$  (IIB) or  $436 \text{ }\mu\text{H}/\Omega$  (IIA);

For Universal Converter, Type 9116.1:

$U_o = 28 \text{ V}$ ;  $C_o = 80 \text{ nF}$  (IIC) or  $640 \text{ nF}$  (IIB) or  $2.1 \text{ }\mu\text{F}$  (IIA);

For Universal Converter, Type 9116.2:

$U_o = 21.4 \text{ V}$ ;  $C_o = 0.16 \text{ }\mu\text{F}$  (IIC) or  $1.13 \text{ }\mu\text{F}$  (IIB) or  $4.15 \text{ }\mu\text{F}$  (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:

$U_i = 30 \text{ V}$ ;  $I_i = 120 \text{ mA}$ ;  $P_i = 900 \text{ mW}$ ;  $C_i = 6 \text{ nF}$ ;  $L_i = 2 \text{ }\mu\text{H}$ ;

$U_o = 16.6 \text{ V}$ ;  $I_o = 0.2 \text{ mA}$ ;  $P_o = 0.8 \text{ mW}$ ;  $C_o = 0.4 \text{ }\mu\text{F}$  (IIC) or  $2.3 \text{ }\mu\text{F}$  (IIB) or  $9.5 \text{ }\mu\text{F}$  (IIA);

$L_o = 1000 \text{ mH}$  (all groups);  $L_o/R_o = 25 \text{ mH}/\Omega$  (IIC),  $100 \text{ mH}/\Omega$  (IIB) or  $200 \text{ mH}/\Omega$  (IIA);

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

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