

# CERTIFICATE

## UK Type Examination

- (1) **Product or Protective System Intended for use in Potentially Explosive Atmospheres - UKSI 2016:1107 (as amended) – Schedule 3A, Part 1**
- (2) UK Type Examination Certificate Number: **DEKRA 23UKEX0104X** Issue Number: **0**
- (3) Product: **Universal Converter, Type 9116B1 and Type 9116B2**
- (4) Manufacturer: **PR electronics A/S**
- (5) Address: **Lerbakken 10, 8410 Rønne, Denmark**
- (6) This product and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.
- (7) DEKRA Certification UK Ltd., Approved Body number 8505 in accordance with Regulation 42 of the Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres Regulations 2016, UKSI 2016:1107 (as amended), 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 Schedule 1 of the Regulations.  
The examination and test results are recorded in confidential report **EX22090003-002** Issue **0**.
- (8) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:  
**EN IEC 60079-0 : 2018** **EN 60079-11 : 2012**  
except in respect of those requirements listed at item 18 of the Schedule to this certificate.
- (9) 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.
- (10) This UK Type Examination Certificate relates only to the design and construction of the specified product. Further requirements of the Regulations apply to the manufacturing process and supply of this product. These are not covered by this certificate.
- (11) The marking of the product shall include the following:

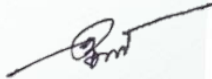


**II (1) G [Ex ia Ga] IIC/IIB/IIA**  
**II (1) D [Ex ia Da] IIIC**  
**I (M1) [Ex ia Ma] I**

Date of certification: 26 October 2023



DEKRA Certification UK Ltd.

  
Abul Kashem  
Certification Manager

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(13) **SCHEDULE**

(14) **to UK Type Examination Certificate DEKRA 23UKEX0104X**

Issue No. 0

(15) **Description**

Universal Converter, 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 the use of apparatus of equipment category 3 G is required, the following electrical data applies:

Supply (terminals 31, 32 and rear contacts):  $U = 19,2 \dots 31,2 \text{ Vdc}$ .

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

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

Status-Relay output (terminals 33, 34):  $U \leq 32 \text{ Vac}$  or  $32 \text{ Vdc}$ ,  $I \leq 0,5 \text{ Aac}$  or  $I \leq 1 \text{ Adc}$  respectively.

For all circuits above:  $U_m = 253 \text{ Vac}$  (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:

$U_o = 8,3 \text{ V}$ ;  $I_o = 13,1 \text{ mA}$ ;  $P_o = 27,3 \text{ mW}$ ;  $C_o = 7 \mu\text{F}$  (IIC) or  $73 \mu\text{F}$  (IIB) or  $1000 \mu\text{F}$  (IIA);

$L_o = 207 \text{ mH}$  (IIC) or  $828 \text{ mH}$  (IIB) or  $1000 \text{ mH}$  (IIA);

$L_o/R_o = 1 \text{ mH}/\Omega$  (IIC),  $5 \text{ mH}/\Omega$  (IIB) or  $10 \text{ mH}/\Omega$  (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:

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

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

For Universal Converter, Type 9116B1:

$U_o = 28 \text{ V}$ ;  $C_o = 80 \text{ nF}$  (IIC) or  $640 \text{ nF}$  (IIB) or  $2,1 \mu\text{F}$  (IIA);

For Universal Converter, Type 9116B2:

$U_o = 21,4 \text{ V}$ ;  $C_o = 0,16 \mu\text{F}$  (IIC) or  $1,13 \mu\text{F}$  (IIB) or  $4,15 \mu\text{F}$  (IIA).

Loop input circuit (terminals 51-53):

in type of protection intrinsic safety Ex ia IIC/IIB/IIA/IIIC/I, with following maximum values:

$U_i = 30 \text{ V}$ ;  $I_i = 120 \text{ mA}$ ;  $P_i = 900 \text{ mW}$ ;  $C_i = 3 \text{ nF}$ ;  $L_i = 1 \mu\text{H}$ ;

$I_o = 1,1 \text{ mA}$ ;  $P_o = 8 \text{ mW}$ ;  $L_o = 1000 \text{ mH}$  (all groups);

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

For Universal Converter, Type 9116B1:

$U_o = 28 \text{ V}$ ;  $C_o = 80 \text{ nF}$  (IIC) or  $640 \text{ nF}$  (IIB) or  $2,1 \mu\text{F}$  (IIA);

For Universal Converter, Type 9116B2:

$U_o = 21,4 \text{ V}$ ;  $C_o = 0,16 \mu\text{F}$  (IIC) or  $1,13 \mu\text{F}$  (IIB) or  $4,15 \mu\text{F}$  (IIA);



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(14) **to UK Type Examination Certificate DEKRA 23UKEX0104X**

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Loop input supply circuit (terminals 51-52):

in type of protection intrinsic safety Ex ia IIC/IIB/IIA/IIIC/I, with following maximum values:

$U_i = 30 \text{ V}$ ;  $I_i = 120 \text{ mA}$ ;  $P_i = 900 \text{ mW}$ ;  $C_i = 3 \text{ nF}$ ;  $L_i = 1 \text{ }\mu\text{H}$ ;

$U_o = 8,3 \text{ V}$ ;  $I_o = 0,2 \text{ mA}$ ;  $P_o = 0,4 \text{ mW}$ ;  $C_o = 7 \text{ }\mu\text{F}$  (IIC) or  $73 \text{ }\mu\text{F}$  (IIB) or  $1000 \text{ }\mu\text{F}$  (IIA);

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

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

$I_o = 93 \text{ mA}$ ;  $P_o = 650 \text{ mW}$ ;  $L_o = 4 \text{ mH}$  (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 9116B1:

$U_o = 28 \text{ V}$ ;  $C_o = 80 \text{ nF}$  (IIC) or  $640 \text{ nF}$  (IIB) or  $2,1 \text{ }\mu\text{F}$  (IIA);

For Universal Converter, Type 9116B2:

$U_o = 21,4 \text{ V}$ ;  $C_o = 0,16 \text{ }\mu\text{F}$  (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.

**Installation instructions**

The instructions provided with the product shall be followed in detail to assure safe operation.

(16) **Report Number**

EX22090003-002 Issue 0.

(17) **Specific conditions of use**

The Universal Converter shall be installed in a controlled environment with suitably reduced pollution, limited to pollution degree 2 or better.

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

(18) **Essential Health and Safety Requirements**

In addition to the Essential Health and Safety Requirements covered by the standards listed at item 9, all other requirements are demonstrated in the relevant reports.

(19) **Test documentation**

As listed in Report number EX22090003-002 Issue 0.