

CERTIFICATE

(1) EU-Type Examination

(2) **Equipment or protective systems intended for use in potentially explosive atmospheres - Directive 2014/34/EU**

(3) EU-Type Examination Certificate Number: **DEKRA 11ATEX0244 X** Issue Number: **4**

(4) Product: **HART-Transparent Repeater, Types 9106B1A, 9106B1B, 9106B2A , 9106B2B and Types 9106A1A, 9106A1B, 9106A2A , 9106A2B**

(5) Manufacturer: **PR electronics A/S**

(6) Address: **Lerbakken 10, 8410 Rønede, Denmark**

(7) This product and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

(8) DEKRA Certification B.V., Notified Body number 0344 in accordance with Article 17 of Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014, 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 Annex II to the Directive.

The examination and test results are recorded in confidential test report number NL/DEK/ExTR11.0097/04.

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN IEC 60079-0 : 2018

EN 60079-11 : 2012

EN 60079-15 : 2019

EN 60079-7 : 2015 + A1 : 2018

except in respect of those requirements listed at item 18 of the Schedule.

(10) 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.

(11) This EU-Type Examination Certificate relates only to the design and construction of the specified product. Further requirements of the Directive apply to the manufacturing process and supply of this product. These are not covered by this certificate.

(12) 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: 23 June 2020

DEKRA Certification B.V.

R. Schuller
Certification Manager



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(15) **Description**

HART-Transparent Repeater, Types 9106B1A, 9106B1B, 9106B2A, 9106B2B and Types 9106A1A, 9106A1B, 9106A2A, 9106A2B for rail mounting, are 24 V powered isolating barriers that serve as a repeater.

The repeater transfers the intrinsically safe 4 - 20 mA current signal (with HART communication) of either a loop powered transmitter or an active current source to a non-intrinsically safe 4 - 20 mA output signal (with HART communication).

The Repeater 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 Repeater.

The HART-Transparent Repeater, Types 9106B*A, 9106A*A are one channel version and Types 9106B*B, 9106A*B are two channel version.

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

Marking

The equipment marking may additionally include the code II 3 G Ex ec nC IIC T4 Gc.

Electrical data

All Repeater Types

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

Status-Relay output (terminals 33, 34):

$U \leq 32$ Vac or 32 Vdc, $I \leq 0,5$ Aac or $I \leq 1$ Adc respectively.

If the Repeater is installed outside the hazardous area, the following data for the relay contacts apply: $U \leq 110$ Vdc or 125 Vac, $I \leq 0,3$ Adc or $I \leq 0,5$ Aac respectively.

Outputs (terminals 11, 12 resp. 13, 14): $I = 4 \dots 20$ mA.

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

Repeater Types 9106B1A, 9106B1B, 9106B2A, 9106B2B

Loop current input (terminals 43, 44 resp. terminals 53, 54):

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

for Type 9106B1A and Type 9106B1B:

$U_o = 27,5$ V; $I_o = 92,6$ mA; $P_o = 0,64$ W;

$C_o = 0,084$ μ F (IIC) or 0,67 μ F (IIB) or 2,23 μ F (IIA) or 3,94 μ F (I);

$L_o = 4,15$ mH (IIC) or 16,59 mH (IIB) or 33,17 mH (IIA) or 54,42 mH (I);

$L_o/R_o = 223$ μ H/ Ω (IIB) or 447 μ H/ Ω (IIA) or 733 μ H/ Ω (I)

for Type 9106B2A and Type 9106B2B:

$U_o = 25,3$ V; $I_o = 96$ mA; $P_o = 0,61$ W;

$C_o = 0,104$ μ F (IIC) or 0,818 μ F (IIB) or 2,85 μ F (IIA) or 4,74 μ F (I);

$L_o = 3,86$ mH (IIC) or 15,43 mH (IIB) or 30,86 mH (IIA) or 50,64 mH (I).

$L_o/R_o = 234$ μ H/ Ω (IIB) or 468 μ H/ Ω (IIA) or 769 μ H/ Ω (I)

For group IIIC, the parameters of group IIB apply.

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Current input (terminals 41, 42 resp. terminals 51, 52):
in type of protection intrinsic safety Ex ia IIC/IIB/IIA/IIIC/I, for connection to a certified intrinsically safe circuit, with following maximum values:
 $U_i = 30 \text{ V}$; $I_i = 120 \text{ mA}$; $P_i = 0,85 \text{ W}$; $C_i = 2 \text{ nF}$; $L_i = 0 \text{ }\mu\text{H}$;
 $U_o = 0 \text{ V}$; $I_o = 0 \text{ mA}$; $P_o = 0 \text{ mW}$.

Current input and Loop current input of one channel are not applied simultaneously.

Both channels (terminals 41...44 and terminals 51...54) are infallibly galvanically isolated from each other and from the non-intrinsically safe supply and output circuits

Combination of Loop current input of channel 1 (terminals 43, 44) and Current input of channel 2 (terminals 51, 52) in series, where terminal 43 is connected to terminal 51:

Loop current circuit (terminals 44 and 52) is in type of protection intrinsic safety Ex ia IIC/IIB/IIA/IIIC/I, with following maximum values:

for Type 9106B1A and Type 9106B1B:

$U_o = 27,5 \text{ V}$; $I_o = 92,6 \text{ mA}$; $P_o = 0,64 \text{ W}$;

$C_o = 0,084 \text{ }\mu\text{F}$ (IIC) or $0,67 \text{ }\mu\text{F}$ (IIB) or $2,23 \text{ }\mu\text{F}$ (IIA) or $3,94 \text{ }\mu\text{F}$ (I) ;

$L_o = 4,15 \text{ mH}$ (IIC) or $16,59 \text{ mH}$ (IIB) or $33,17 \text{ mH}$ (IIA) or $54,42 \text{ mH}$ (I);

$L_o/R_o = 223 \text{ }\mu\text{H}/\Omega$ (IIB) or $447 \text{ }\mu\text{H}/\Omega$ (IIA) or $733 \text{ }\mu\text{H}/\Omega$ (I)

for Type 9106B2A and Type 9106B2B:

$U_o = 25,3 \text{ V}$; $I_o = 96 \text{ mA}$; $P_o = 0,61 \text{ W}$;

$C_o = 0,104 \text{ }\mu\text{F}$ (IIC) or $0,818 \text{ }\mu\text{F}$ (IIB) or $2,85 \text{ }\mu\text{F}$ (IIA) or $4,74 \text{ }\mu\text{F}$ (I);

$L_o = 3,86 \text{ mH}$ (IIC) or $15,43 \text{ mH}$ (IIB) or $30,86 \text{ mH}$ (IIA) or $50,64 \text{ mH}$ (I).

$L_o/R_o = 234 \text{ }\mu\text{H}/\Omega$ (IIB) or $468 \text{ }\mu\text{H}/\Omega$ (IIA) or $769 \text{ }\mu\text{H}/\Omega$ (I)

For group IIIC, the parameters of group IIB apply.

Combination of both Current inputs (terminals 41, 42 resp. 51, 52) in series, where terminal 41 is connected to terminal 52:

Current input (terminals 42 and 51) is in type of protection intrinsic safety Ex ia IIC/IIB/IIA/IIIC/I, for connection to a certified intrinsically safe circuit, with following maximum values:

$U_i = 30 \text{ V}$; $I_i = 120 \text{ mA}$; $P_i = 0,85 \text{ W}$; $C_i = 4 \text{ nF}$; $L_i = 0 \text{ }\mu\text{H}$;

$U_o = 0 \text{ V}$; $I_o = 0 \text{ mA}$; $P_o = 0 \text{ mW}$.

Installation instructions

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

(16) **Report Number**

No. NL/DEK/ExTR11.0097/04.

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(17) **Specific conditions of use**

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

The non intrinsically safe circuits shall be limited to overvoltage category I/II as defined in EN 60664-1.

If the HART-Transparent Repeater is installed in an explosive atmosphere where the use of apparatus of equipment category 3 G is required, the following specific conditions of use apply:

The HART Transparent Repeater 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 fulfil the same requirements.

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

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

Covered by the standards listed at item (9)

(19) **Test documentation**

As listed in Report No. NL/DEK/ExTR11.0097/04.

(20) **Certificate history**

Issue 1 - 214940700 initial certificate
Issue 2 - 215635200 changes to the construction and standards update
Issue 3 - 219950900 changes to the electrical data
Issue 4 - 224396500 assessed per latest edition of the standards
addition of 9106Axx models