CERTIFICATE

(1) EC-Type Examination

(2) **Equipment and protective systems intended for use in potentially explosive atmospheres - Directive 94/9/EC**

(3) EC-Type Examination Certificate Number: **DEKRA 11ATEX0244 X** Issue Number: **1**

(4) Equipment: **HART-Transparent Repeater, Type 9106B1A, Type 9106B1B, Type 9106B2A and Type 9106B2B**

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

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

(7) This equipment 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 9 of the Council Directive 94/9/EC of 23 March 1994, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems 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/**.

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

EN 60079-0 : 2009 **EN 60079-11 : 2007** **EN 60079-15 : 2005**
EN 60079-26 : 2007 **EN 61241-11 : 2006**

(10) If the sign "X" is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the schedule to this certificate.

(11) This EC-Type Examination Certificate relates only to the design, examination and tests of the specified equipment according to the Directive 94/9/EC. Further requirements of the directive apply to the manufacturing process and supply of this equipment. These are not covered by this certificate.

(12) The marking of the equipment shall include the following:

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

This certificate is issued on 2 December, 2011 and, as far as applicable, shall be revised before the date of cessation of presumption of conformity of (one of) the standards mentioned above as communicated in the Official Journal of the European Union.

DEKRA Certification B.V.

C.G. van Es
Certification Manager

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(13) **SCHEDULE**

(14) **to EC-Type Examination Certificate DEKRA 11ATEX0244 X** Issue No. **1**

(15) **Description**

HART-Transparent Repeater, Type 9106B1A, Type 9106B1B, Type 9106B2A and Type 9106B2B, 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, Type 9106B*A is a one channel version and Type 9106B*B is a two channel version.

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

Marking

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

Electrical data

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

Status-Relay output (terminals 33, 34):
U ≤ 32 Vac or 32 Vdc, I ≤ 0,5 Aac or I ≤ 1 Adc respectively.
If the Repeater 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.

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

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

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 = 28 V; I_o = 93 mA; P_o = 0,65 W;
C_o = 0,08 µF (IIC) or 0,6 µF (IIB) or 2,15 µF (IIA) or 3,76 µF (I);
L_o = 3 mH (IIC) or 12 mH (IIB) or 25 mH (IIA) or 30 mH (I);

for Type 9106B2A and Type 9106B2B:
U_o = 25,6 V; I_o = 100 mA; P_o = 0,64 W;
C_o = 0,10 µF (IIC) or 0,80 µF (IIB) or 2,75 µF (IIA) or 4,65 µF (I);
L_o = 2 mH (IIC) or 9 mH (IIB) or 15 mH (IIA) or 25 mH (I).
For group IIIC, the parameters of group IIB apply.

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 V; Ii = 120 mA; Pi = 0,85 W; C_i = 2 nF; L_i = 0 µH;
U_o = 0 V; I_o = 0 mA; P_o = 0 mW.

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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 = 28 V; I_o = 93 mA; P_o = 0,65 W;
C_o = 0,08 µF (IIC) or 0,6 µF (IIB) or 2,15 µF (IIA) or 3,76 µF (I);
L_o = 3 mH (IIC) or 12 mH (IIB) or 25 mH (IIA) or 30 mH (I);

for Type 9106B2A and Type 9106B2B:
U_o = 25,6 V; I_o = 100 mA; P_o = 0,64 W;
C_o = 0,10 µF (IIC) or 0,80 µF (IIB) or 2,75 µF (IIA) or 4,65 µF (I);
L_o = 2 mH (IIC) or 9 mH (IIB) or 15 mH (IIA) or 25 mH (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 V; Ii = 120 mA; Pi = 0,85 W; C_i = 4 nF; L_i = 0 µH;
U_o = 0 V; I_o = 0 mA; P_o = 0 mW.

Installation instructions

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

(16) **Test Report**

No. NL/DEK/ExTR11.0097/**.

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(17) **Special conditions for safe 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 (9).

(19) **Test documentation**

As listed in Test Report No. NL/DEK/ExTR11.0097/**.