

TYPE APPROVAL CERTIFICATE**This is to certify:****That the Peripheral Equipment**

with type designation(s)

Isolators/converters/repeaters type 3103, 3104, 3105, 3108, 3109, 3114, 3405, 3185, 3186, 3117, 3118, 3101, 3102, 3111, 3112, 3113, 3337, 3331, 3333

Issued to

**PR electronics A/S
Rønde, Midtjylland, Denmark**

is found to comply with

DNV GL rules for classification – Ships, offshore units, and high speed and light craft**Application :****Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.****Location classes:**

Temperature	D
Humidity	B
Vibration	B
EMC	B
Enclosure	Required protection according to relevant rules shall be provided upon installation on board

Issued at **Høvik** on **2020-10-05**for **DNV GL**This Certificate is valid until **2023-03-08**.DNV GL local station: **Denmark CMC**Approval Engineer: **Ståle Sneen****Marta Alonso Pontes
Head of Section**

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid. The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV GL AS, its parent companies and subsidiaries as well as their officers, directors and employees ("DNV GL") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.



Job Id: **262.1-010635-10**
Certificate No: **TAA00001RW**
Revision No: **2**

Product description

Isolators, converters, and repeaters as listed below:

Type	Model	Name
FIX-SUP – Fixed input converters, supplied	3103	Isolated repeater
FIX-SUP – Fixed input converters, supplied	3104	Isolated converter
FIX-SUP – Fixed input converters, supplied	3105	Isolated converter
FIX-SUP – Fixed input converters, supplied	3108	Isolated repeater/splitter
FIX-SUP – Fixed input converters, supplied	3109	Isolated converter/splitter
UNI-SUP – Universal input converter, supplied	3114	Isolated universal converter
Flexible supply	3405	Power connector unit
PAS-ISO – Passive isolator, input loop powered	3185A1	1 channel loop-powered isolator
PAS-ISO – Passive isolator, input loop powered	3185A2	2 channel loop-powered isolator
PAS-ISO – Passive isolator, output loop powered	3186A1	1 channel transmitter isolator
PAS-ISO – Passive isolator, output loop powered	3186A2	2 channel transmitter isolator
PAS-ISO – Passive isolator, output loop powered	3186B1	1 channel current isolator
PAS-ISO – Passive isolator, output loop powered	3186B2	2 channel current isolator
BIPOL-SUP – Bipolar isolators, supplied	3117	Isolated converter
BIPOL-SUP – Bipolar isolators, supplied	3118	Isolated converter/splitter
TEMP-SUP – Temperature converters, supplied	3101	Non-isolated TC converter
TEMP-SUP – Temperature converters, supplied	3102	Non-isolated Pt100 converter
TEMP-SUP – Temperature converters, supplied	3111	Isolated TC converter
TEMP-SUP – Temperature converters, supplied	3112	Isolated Pt100 converter
HART® – Temperature converters	3113	HART® isolated temperature converter
HART® – Temperature converters	3337	2-wire HART®-LOOP isolated temp. converter
TEMP-LOOP – Temperature converter, output loop powered	3331	2-wire isolated temperature converter
TEMP-LOOP – Temperature converter, output loop powered	3333	Non-isolated 2-wire Pt100 converter

The 3xxx-N versions are without power rail connection.

Approval conditions

The Type Approval covers hardware listed under Product description. When the hardware is used in applications to be classed by DNV GL, documentation for the actual application is to be submitted for approval by the manufacturer of the application system in each case. Reference is made to DNV GL rules for classification of ships Pt.4 Ch.9 Control and monitoring systems.


Application/Limitation

EMC in the range 2 GHz to 6 GHz according to DNVGL-CG-0339, December 2019 has not been documented. EMC up to 6 GHz must additionally be documented for installation on ships contracted for construction on or after 2022-01-01.

Ex installations to be approved in each case according to the Rules and Ex-Certification/Special Condition for Safe Use listed in valid Ex-certificate issued by a notified/recognized Certification Body.

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Ex-certification is not covered by this certificate and the following paragraph, which is for information only, is based on information received from the manufacturer, but not verified by DNV GL.

Information on Ex-Certification received from manufacturer – Not verified by DNV GL		
Equipment	Certified	Certificate No.
Isolators and converters of system3000 Type 3...	 II 3 G Ex nA IIC T4 Gc	KEMA 10ATEX0147 X issue No. 8
	Ex nA IIC T4 Gc	IECEx KEM 10.0068X issue No. 7

Type Approval documentation

Data sheets:

Silicon Labs Digital Isolators, drawing no. Si8410/20/21 / SI8422/23, rev.01 dated June 2010
Optocoupler S-IC-1008, drawing no. S-IC-1008-D001.xls dated 2010-09-07
Digital Isolator S-IC-8420, drawing no. S-IC-8420-1-D002.xls dated 2010-09-10
VISHAY optocoupler TCLT10 Series, drawing no. 83515, rev.2.2 dated 2008-11-21
Label for System 3000, drawing no. 3000S1 revision 04
System 3000 overview, drawing no. 3000G001 V12R0 dated 2016-12-14
3186 2-wire transmitter isolator / current isolator, data sheet no. 3186-020818

Specifications:

S-TR040-UL-01, V0R3 dated 2010-12-06
S-TR040-UL-01A, V1R0 dated 2016-03-31
S-TR041-UL-01, V0R3 dated 2010-12-06
S-TR041-UL-01A, V1R0 dated 2016-03-31
S-TR042-UL-01, V0R3 dated 2010-12-06
S-TR042-UL-01A, V1R0 dated 2016-03-31
S-TR042-UL-01, V0R3 dated 2010-12-06
S-TR043-UL-01A, V1R0 dated 2016-03-31
S-TR050-UL-21, V0R2 dated 2011-09-05
S-TR050-UL-22, V0R9 dated 2016-02-16

Layout drawings:

PCB Terminals, drawing no. 3 48129 rev. 00 dated 2009-10-13
PCB Terminals, drawing no. C 48129 rev. 03 dated 2011-10-04
Housing, drawing no. 2 61738 rev. 05 dated 2018-06-14
Housing, drawing no. 3 61738 rev. 05 dated 2018-06-14
Housing, drawing no. 61739 rev. 03 dated 2020-06-17
Cover, drawing no. C 48135 rev. 04 dated 2010-02-11
Cover, drawing no. C 50631 rev. 03 dated 2010-02-11
Bus Connector, drawing no. C 50979 rev. 02 dated 2010-05-26
Schematic Layout 3109-1-07 dated 2012-06-29
Schematic Layout 3112-1-07 dated 2013-12-09
Schematic Layout 3114-1-02 dated 2010-09-24
Schematic Layout 3185-1-05 dated 2011-10-14
Schematic Layout 3186-1-06 dated 2016-10-13

Manuals:

Manual for 3114 – Isolated universal converter, drawing no. 3114V102-UK
Manual for 3117 – Bipolar isolated converter, drawing no. 3117V101-UK
Manual for 3118 – Bipolar isolated converter / splitter, drawing no. 3118V101-UK
Manual for 3185 – Loop powered isolator, drawing no. 3185V100-UK
Manual for 3186A – 2-wire transmitter isolator/3186B-2-wire current isolator, drawing no. 3186V101-UK
Manual for 3000 Series – 6mm Series of Temperature Converters, drawing no. 3000V103-UK
Manual for 3100 Series – 6mm Series of Isolators and Converters, drawing no. 3100V107-UK
Project Overview 6mm Series Phase 1, drawing no. v4r0 PR.doc dated 2010-09-17
Brochure 3100 Series 6 mm Isolators and converters, drawing no. 1031W01UK(1019)
Project Overview 6mm Series Phase 2 v0r9 WI dated 2013-06-12

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Installation guide SN3000_113(1741)

Test Reports:

3109/3114 Damp Heat Test Report, V2R0 dated 2011-01-14
3109 Acceptance test report V10R0 dated 2011-01-20
3109 Integration Test Report V9R0 dated 2010-08-31
3109 Routine Test Specification V6R0 dated 2010-09-01
3114 Acceptance Test Report V3R0 dated 2011-01-20
3114 Routine Test Specification V2R0 dated 2010-10-22
3114 Integration test report V2R0 dated 2010-09-17
3109/3114 Marine Test Report, V3R0 dated 2011-03-18
3118 Acceptance Test Report V2R0 dated 2012-07-06
Delta Vibrations Test Report no. DANAK-1911132 dated 2010-11-15
3185 Acceptance Test Report V3R0 dated 2011-10-26
3186 Acceptance Test Report V7R0 dated 2017-04-25
Delta Vibrations Test Report no. DANAK-1911455 / DELTA-T200103 dated 2011-07-06
3112 Marine Test Report V2R0 dated 2013-06-21
3000 GL Edition 2012 Dry Heat Test Report V1R0 dated 2013-09-02

Type approval renewal assessment report for TAA00001RW, DNV GL Aalborg 2018-03-08

Tests carried out

Applicable tests according to class guideline DNVGL-CG-0339, November 2016.

Marking of product

The products to be marked with model name, manufacturer name and serial number.

Periodical assessment

The scope of the periodical assessment is to verify that the conditions stipulated for the type are complied with, and that no alterations are made to the product design or choice of systems, software versions, components and/or materials.

The main elements of the assessment are:

- Ensure that type approved documentation is available
- Inspection of factory samples, selected at random from the production line (where practicable)
- Review of production and inspection routines, including test records from product sample tests and control routines
- Ensuring that systems, software versions, components and/or materials used comply with type approved documents and/or referenced system, software, component and material specifications
- Review of possible changes in design of systems, software versions, components, materials and/or performance, and make sure that such changes do not affect the type approval given
- Ensuring traceability between manufacturer's product type marking and the type approval certificate

Periodical assessment is to be performed after 2 years and after 3.5 years. A renewal assessment will be performed at renewal of the certificate.

END OF CERTIFICATE