DNV·GL

Certificate No:
TAA00000JD

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Peripheral Equipment

with type designation(s)
Signal conditioning units 9106, 9107, 9113, 9116, 9202, 9203,
Power control unit 9410,
Modbus communication enabler 4511

Issued to
PR electronics A/S
Rønde, Denmark

is found to comply with
DNV GL rules for classification – Ships and offshore units

Application :

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.

Location classes:

Type	Temp.	Humidity	Vibration	EMC	Enclosure
Signal conditioning units	D	B	A	B	Required protection
Power control unit	D	B	A	B	according to relevant rules
Modbus communication enabler	D	B	A	B	shall be provided upon installation on board

This Certificate is valid until **2021-06-30**.
Issued at **Høvik** on **2016-07-05**

DNV GL local station: **Aalborg**

Approval Engineer: **Ståle Sneen**

for **DNV GL**
Digitally Signed By: Nesvåg, Odd Magne
Location: DNV GL Høvik, Norway
Signing Date: 2016-07-05

Odd Magne Nesvåg
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.

Product description

Signal conditioning units and power control unit as listed below:

Model	Description	Function
9202B2A	NAMUR isolator – relay NO	NAMUR in (from Ex) to relay out
9202B3A	NAMUR isolator – relay NC	NAMUR in (from Ex) to relay out
9202B1A	NAMUR isolator	NAMUR in (from Ex) to digital out
9202B2B	2 Ch. NAMUR isolator – relay NO	2x NAMUR in (from Ex) to 2x relays out
9202B3B	2 Ch. NAMUR isolator – relay NC	2x NAMUR in (from Ex) to 2x relays out
9202B1B	2 Ch. NAMUR isolator	2x NAMUR in (from Ex) to 2x digital out
9203B1A	Solenoid/alarm driver L	digital in to safe digital out (to Ex IIC)
9203B2A	Solenoid/alarm driver H	digital in to safe digital out (to Ex IIB)
9203B1B	2 Ch. Solenoid/alarm driver	2x digital in to 2x safe digital out (to Ex)
9106B1A	HART-transparent repeater	mA in (from Ex) to mA out with HART transparency
9106B1B	2 Ch. HART-transparent repeater	2x mA in (from Ex) to 2x mA out with HART transparency
9107BA	HART-transparent driver	mA in to mA out (to Ex) with HART transparency
9107BB	2 Ch. HART-transparent driver	2x mA in to 2x mA out (to Ex) with HART transparency
9113BA	Temperature/mA converter	temperature in (from Ex) to mA out
9113BB	2 Ch. temperature/mA Converter	2x temperature in (from Ex) to 2x mA out
9116B1	Universal converter	universal analog in (from Ex) to analog (V/mA) + trip relay out
9116B2	Universal converter Low Voltage	universal analog in (from Ex) to analog (V/mA) + trip relay out
9410	Power Control Unit	Supply Voltage distribution to Power Rail
4511	Modbus communication enabler	Modbus RTU protocol interface over RS-485 for 4000 and 9000 modules

Power control unit 9410 tested for power supply voltage 24 Vdc ±10%.
Modbus communication enabler is powered from the module to which it is attached.
Other units tested for power supply voltage 24 Vdc +30% and 24 Vdc -20%.

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

To satisfy the class requirements for power supply variations, the units are to be installed with a power supply of approved type.

Ex-certification is not covered by this certificate. Application in hazardous area 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.

Type Approval documentation

Drawings / data sheets:
Data sheet Frontplate with interface for 4501, dated 2011-09-18
Drawing PB4511-11-UL, drawing no. d_4511_front, rev. A
Drawing PB4511-22-UL, drawing no. d_4511_back, rev. A
Drawing PB 5000 F31, dated 2010-06-07
Data sheet 9000 Transmitter enclosure, dated 2011-09-18
Drawing PB 9000 HUS, drawing no. PB9000S1-UL, dated 2010-09-06
Label for System 9000, drawing no. 9000-S101, dated 2011-09-18

Layout drawings:
Schematic Layout 4511-1-05 dated 2013-06-20
Schematic Layout 9106-1-05 dated 2011-10-31
Schematic Layout 9107-1-01 dated 2011-10-10
Schematic Layout 9113-1-05 dated 2009-10-27
Schematic Layout 9116-1-03 dated 2010-01-26
Schematic Layout 9202-1-06 dated 2011-10-13
Schematic Layout 9203-1-07 dated 2011-08-25
Schematic Layout 9410-1-03 dated 2009-04-02

Manuals:
Manual for 4511 – 4511V100-UK
Manual for 9106 – 9106V100-UK
Manual for 9107 – 9107V100-UK
Manual for 9113 – 9113V103-UK
Manual for 9116 – 9116V102-UK
Manual for 9202 – 9202V103-IN
Manual for 9203 – 9202V102-IN
Manual for 9410 – 9410V100-IN

Test Reports:
4511 Acceptance Test Report, V2R0 dated 2013-07-12
9000 DNV Test Record, V0R1 dated 2012-03-23
9000 Marine Test Report, V2R0 dated 2012-06-01
9106 Acceptance Test Report, V4R0 dated 2012-02-23
9107 Acceptance Test Report, V3R0 dated 2012-02-23
9113 Acceptance Test Report, V11R0 dated 2012-02-28
9116 Acceptance Test Report, V6R0 dated 2012-03-07
9202 Acceptance Test Report, V9R0 dated 2011-12-02
9203 Acceptance Test Report, V9R0 dated 2011-09-22
9410 Acceptance Test Report, V2R0 dated 2012-02-16
DELTA Vibration Test Report No. DANAK-1910183, dated 2008-06-03
DELTA Vibration Test Report No. DANAK-1911457, dated 2011-07-06
DELTA Vibration Test Report No. DANAK-19/13166, dated 2013-06-18

Tests carried out

Applicable tests according to Standard for Certification No. 2.4, April 2006.

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 at least every second year and at renewal of this certificate.

END OF CERTIFICATE