

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Safety Unit for Rotating Machinery

with type designation(s)
N3000-SAP

Issued to

NORIS Automation GmbH
Nürnberg Bayern, Germany

is found to comply with
DNV GL rules for classification – Ships, offshore units, and high speed and light craft

Application :

Location classes:

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

Temperature B

Humidity B

Vibration B

EMC A

Enclosure Required protection according to the Rules shall be provided upon installation on board

This Certificate is valid until **2023-04-16**.

Issued at **Hamburg** on **2018-04-17**

DNV GL local station: **Augsburg**

for **DNV GL**

Approval Engineer: **Heinz Scheffler**

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Joannis Papanuskas
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.

Certificate No: **TAA00001NJ**
File No: **852.90**
Job Id: **262.1-001965-5**

Product description

The N3000-SAP module will serve as an independent device for overspeed protection, remote emergency stop and automatic shutdown on up to five signal inputs, for example for lube oil pressure, cooling water pressure or temperature and crank case explosive condition (oil mist). The module is designed for duplicated power supply (18-72V DC), redundant speed pickups and redundant shutdown coils. All input loops and the coil loops are monitored for broken circuit. Pickups are checked for consistency (alarm if speed is detected by only one). All input circuits are monitored for earth fault.

The adaption of the module to specific engine types (number of speed pulses per revolution and overspeed limit) is done by two hex (0-F) position switches, S1 and S2.

The function logic is stored in firmware with two different segments. The released version numbers are listed in the Software Release document Info 610 which by the time of issue had version no. 1.28 dated 2014-09-14.

SA677-xxG Amplifier Relay with integrated wire break monitor will be supplied when the shutdown valve needs higher amounts of current than the N3000-SAP is capable of driving.

Approval conditions

The Type Approval covers hardware and software (firmware) listed under Product description.

When the type approved software is revised (affecting all future deliveries) DNVGL is to be informed by forwarding updated software version documentation (overview and release note). If the changes are judged to affect functionality for which rule requirements apply a new function type test may be required and the certificate may have to be renewed to identify the new software version.

The following documentation is to be submitted for approval in each case where DNVGL classification applies:

- Reference to this Type Approval Certificate
- List of installed software (firmware) versions (if different from those identified above)
- System block diagram
- Power supply arrangement (may be part of the System block diagram)
- Lists of alarm and safety signals

The responsible for the above submittal may be the maker of the module, the engine maker, the maker of the control panel or the yard.

Product certificate

As long as the units are covered by the Type Approval, no Product certificate will be required according to Pt.4 Ch.9 Sec.1 A 202. Correct configuration and set up for each delivery to be tested during engine certification or during commissioning after installation. After commissioning the following clause for application software applies.

Clause for application software control

Any replacement of firmware is to be recorded and the records are to be kept onboard. A major change of functionality is to be approved before being installed.

Application/Limitation

Neither duplicated power supply nor standby power is required by the Rules. Assuming that loss of the module is monitored by the main alarm system a single rectifier power supply may be looped to both Batt.1 and Batt.2 terminals.

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Type Approval documentation

Test Reports:

Final performance test at the test engine 6M25C dated 080604; N3000-SAP-x "Product test report" Nov./Dec. 2006; Humidity test, Device: N3000-SAP dated 11.12.2006; Vibration test, Device: N3000-SAP dated 06.12.2006; No. 26 1928 RP1 (EMC emissions) dated 15. Januar 2007; No. 26 1928 RP2 (EMC immunity) dated 15. Januar 2007; No. E 4.042 SINUS vibrationtest dated 09. Februar 2007

Documents:

I609E_V1.50_N3000-SAP; I610E_V1.43_N3000-SAP_SoftwareRevision; FMEA -Produkt- Rev_C für N3000-SAP.pdf (rev. C dated 21.02.07); I619E_V105_AmpliferRelay SA677 dated 2012-11-06; Block N3000-SAP_Rev K_140204 dated 2014-02-04

Tests carried out

Applicable tests according to class guideline DNVGL-CG-0339, November 2016.
Functional Type Test together with an engine at Caterpillar, Kiel, 2008.06.04.

Marking of product

On front panel of the module:

N3000-SAP *NORIS* or

PD-N3000 CAT MaK when supplied together with Caterpillar MaK engines or

N3000-SAP YANMAR when supplied together with YANMAR engines

On the type plate:

N3000-SAP-klmn (klmn according to marking tables on last page of Info610E)

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