



Certificate No:
TAA000031R

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Power Management System

with type designation(s)
SISHIP/SINAVY PMA72

Issued to

Siemens Energy Global GmbH & Co. KG
Hamburg, Germany

is found to comply with

DNV rules for classification – Ships, offshore units, and high speed and light craft
DNV rules for classification – Naval vessels

Application :

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

Location classes:

Temperature	None*
Humidity	None*
Vibration	None*
EMC	None*
Enclosure	None*

* Software System Certificate

Issued at **Hamburg** on **2022-02-07**

This Certificate is valid until **2027-02-06**.

for **DNV**

DNV local station: **Hamburg – CMC North/East**

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.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") 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.



Form code: TA 251

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Product description

Power Management Automation system SISHIP/SINAVY PMA72 is controlling the power system whether to supply the amount and quality of electrical power as demanded by the various consumers in an efficient and safe way.

System and Hardware Requirements:

All PMA72 units are communicating with each other in a PROFINET ring using MRP (Media Redundancy Protocol) which allows a ring configuration within an ethernet network. This allows a wire brake between two stations without effects on the system and can handle "broadcast storm" events. Using the ISO-on-TCP communication supports the highly availability of the cross communication.

Each PMA72 unit has to equipped with its own PLC, protection and synchronizing unit, I/O station and operator panel (HMI), based on type approved certified standard components as requested in the E10231-Y1105-Y007 PMA72 system description

Operating modes:

- Local semi-automatic mode
- Remote semi-automatic mode
- Automatic mode (local and remote)

Functions:

- Standby start selection of Diesel Generator Unit
- Circuit/tie breaker control
- Load sharing symmetrical or asymmetrical
- Blackout recovery
- Emergency Generator control
- Shore connection
- Heavy Consumer Start/Stop control
- Harbor Mode for Emergency Generators
- DP-Mode (Dynamic positioning)
- Shaft Generator control

Software Version: V1.05

Application/Limitation

The hardware which is used in this system must be DNV type approved.

The Type Approval covers the software design principle and basic application software listed under Product description. The possibility hardware and function listed under E10231-Y1105-Y007 PMA72 system description; E10231-Y1105-Y008 PMA72 user interface manual and E10231-Y1105-Y009 PMA72 Parameter list manual and commissioning guide.

Approval conditions

The following documentation of the actual application is to be submitted for ship project approval in each case:

- System Block Diagramms
- Equipment list with type approved hardware
- Power supply arrangement (may be part of the System block diagram)
- Software version used in specific delivery
- Project Interface, Functional and System design description
- Failure modes and effects analysis (FMEA)
- List of control & monitored points (including alarms, shutdowns, setpoints)
- Test procedure base on the rule requirements and the above-mentioned description and FMEA

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

Each delivery of the application system is to be certified according to Pt.4 Ch.9 Sec.1 or Pt.3 Surface ships Ch.4 Sec.8. The certification test is to be performed at the manufacturer of the application system before the system is shipped to the yard. After the certification all software modifications made after the certification test and as long as the system is in use onboard, are to be recorded. The records, together with the software version(s) in use are to be available for evaluation at request by DNV. Major software changes are to be approved before being installed onboard.

Type Approval documentation

Test Reports:

- E10231-Y1105-Y005 PMA72 test manual Version 1.6 Stamped
- E10231-Y1105-Y005 PMA72 test manual Version 1.7 Stamped

Documents:

- E10231-Y1105-Y007 PMA72 system description, rev. 1.5
- E10231-Y1105-Y008 PMA72 user interface manual, rev. 1.3
- E10231-Y1105-Y009 PMA72 Parameter list manual and commissioning guide, rev. 1.05
- E10231-Y1105-Y004 PMA72 FMEA, rev. 1.2
- E10231-Y1105-Y010 PMA72 Software Quality Plan, rev. 1.2
- E10231-Y1105-Y012 Traceability Matrix, rev. 1.0
- E10231-Y1105-Y011 PMA72 Software Release Change Log V1.04
- E10231-Y1105-Y011 PMA72 Software Release Change Log V1.05

Tests carried out

Type test of software as performed according to test reports and documents listed in section "Type Approval Documentation".

Marking of product

Basic software version is displayed in the system graphical user interface.

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