Certificate no.:
TAA00003J6

TYPE APPROVAL CERTIFICATE

This is to certify:

that the Programmable Electronic System

with type designation(s)
CPU and PMM drive control system

issued to
INGETEAM Power Technology S.A.
Zamudio, Bizkaia, Spain

is found to comply with
DNV 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.

Location classes:

Temperature	**A**
Humidity	**B**
Vibration	**A**
EMC	**A**
Enclosure	**A: IP20**

Issued at **Høvik** on **2025-07-04**

This Certificate is valid until **2030-07-03**.

for **DNV**

DNV local unit: **Area NB/CMC Iberia**

Approval Engineer: **Nikolai Arntzen**

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 USD 300 000.

Product description

The distributed frequency converter control system developed by Ingeteam, is based around two different modules, the Power Management Module (PMM) and the Control Process Unit (CPU)

- The PMM AR Series, is in charge of managing the power electronic devices according to application requirements.
- The AR2105 CPU is the core of the distributed architecture of the control electronics and centralizes the processes of regulation and control.

Technical data – PMM AR2515, AR2516, AR2601, AR2532 and AR2533	
Power supply	24VDC ± 15%
Consumed energy	Start 3,5 A Stationary 0.8A
Cooling	Natural convection

Technical data – CPU AR2105	
Power supply	24VDC ± 15%
Consumed energy	Start 3,8 A Stationary 1A
Cooling	Natural convection

Manufactured by:

Ingeteam Power Technology SA
Parque Tecnológico de Bizkaia,
Edificio 108, 48170,
Zamudio,
Spain

Application/Limitation

The Type Approval covers hardware listed under Product description. When the hardware is used in applications to be classed by DNV, 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 rules for classification of ships Pt.4 Ch.9 Control and monitoring systems.

Product certificate

Each delivery of the application system is to be certified according to Pt.4 Ch.9 Sec.1. 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 the clause for application software control will be put into force.

Software control

All changes in software are to be recorded as long as the system is in use on board. Documentation of major changes is to be forwarded to DNV for evaluation and approval before implemented on board. Certification of modified functionality may be required for the particular vessel.

Type Approval documentation

Tests carried out
Applicable tests according to DNV CG-0339, August 2021.

Marking of product
The products to be marked with:
- manufacturer name
- model name
- 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.