



Certificate no.:
TAE000058N

TYPE APPROVAL CERTIFICATE

This is to certify:

that the **Low Voltage Switchgear and Control Gear Assemblies**

with type designation(s)
DC Grid Cabinet

issued to

Promeco Oy
Kankaanpää, Finland

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.

Rated voltage (V)	500-800 VDC
Rated current (A)	885A
Rated frequency (Hz)	-
Degree of protection	44

Issued at **Høvik** on **2026-04-13**

This Certificate is valid until **2031-04-12**.

for **DNV**

DNV local unit: **Finland CMC**

Approval Engineer: **Qiang William Guo**

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 **DC-Grid electrical enclosure** is designed to integrate and distribute traction-voltage power within an electric propulsion system. The enclosure houses copper busbars and overcurrent-protection fuses forming the DC-Grid, enabling both battery-pack charging and power supply to the propulsion system during vessel operation.

The system provides local voltage monitoring through a DVC-1000 voltage transducer (4–20 mA output, 0–1000 VDC scale) and includes a Hazardous Voltage Interlock Loop (HVIL) to ensure safe operation and door-open detection via a dedicated door switch.

Electrical Characteristics

Parameter	Value
Upper extreme traction voltage, 5 s	800–1100 VDC
Upper traction-voltage range	750–800 VDC
Nominal traction-voltage range	500–750 VDC
Control voltage	24VDC
Copper busbar (40 ×10 mm) rated current capacity	885 A DC
Dimension (Lx W x D mm)	760x760x300

Application/Limitation

The Type Approval covers hardware and software listed under Product description. a product certificate according to Pt.4 Ch.9 Sec.1 and Pt 4 Ch 8 Sec. 1 will not be required. Correct configuration and set up for each delivery to be tested during commissioning after installation.

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 in accordance with DNV Rules Pt 4 Ch 9.

The instruction manual from maker should be observed and followed,

Environmental class location according to DNV-CG-0339 AUG.2021

Temperature class	B
Humidity class	B
Vibration class	A
Enclosure class	B

Type Approval documentation

Manufactured by:

Tests carried out

Type test in accordance with DNV-RU-SHIP Pt.4 Ch.8 Sec.4, Edition July 2025, DNV-CG-0339 AUG.2021 i.e. Performance test, High voltage, insulation resistance, Electrical power supply failure, power supply variation, vibration, dry heat, cold damp heat, IP test.

Marking of product

Volvo Penta Part number – AX 1073.000, Serial No., Factory ID, Production date etc.

Periodical assessment

The scope of the periodical assessment is to verify that the conditions stipulated for the Type approval are complied with and that no alterations are made to the product design or choice of materials.

The main elements of the assessment are:

- Inspection on factory samples, selected at random from the production line (where practicable)
- Results from Routine Tests (RT) checked (if not available tests according to RT to be carried out)
- Review of type approval documentation
- Review of possible change in design, materials and performance
- Ensuring traceability between manufacturer's product type marking and 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



Job ID: **262.1-044140-1**
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