

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Automatic Battery Charger**with type designation(s)
HPO

Issued to

**CRISTEC
Quimper, France**is found to comply with
DNV GL rules for classification – Ships, offshore units, and high speed and light craft**Application :****Products approved by this certificate are accepted for installation on all vessels classed by DNV GL.**

Voltage output	12 and 24 V DC
Power	up to 2400 VA
Temperature class	A
Vibration class	A
Humidity class	B
Degree of protection	IP23

Issued at **Høvik** on **2019-06-21**This Certificate is valid until **2024-06-20**.DNV GL local station: **Le Havre**Approval Engineer: **Nicolay Horn**for **DNV GL**

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Trond Sjøvåg
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.



Name and place of manufacturer

DNV GL Id Nos. 105994 and 10640103

Product description

Battery charger. Charging of 12 and 24 V open and closed lead acid (gel, AGM or wet) batteries, lithium batteries and power simultaneously power loads. Power supply mode provides stabilised output voltage for wintering and supply loads.

Type	Input Voltage	Input Current	Output (at 45 °C)	Enclosure
HPO12-90-CERT	1 ph 230/115 V AC, 50/60 Hz, ± 15 %	6.0 A at 230 V AC	12 V DC / 90 A	IP 23
HPO24-45-CERT	1 ph 230/115 V AC, 50/60 Hz, ± 15 %	6.0 A at 230 V AC	24 V DC / 45 A	IP 23
HPO24-60-CERT	1 ph 230/115 V AC, 50/60 Hz, ± 15 %	8.0 A at 230 V AC	24 V DC / 60 A	IP 23
HPO24-80-CERT	1 ph 230/115 V AC, 50/60 Hz, ± 15 %	11.0 A at 230 V AC	24 V DC / 80 A	IP 23
HPO24-100-CERT	1 ph 230/115 V AC, 50/60 Hz, ± 15 %	14.0 A at 230 V AC	24 V DC / 100 A	IP 23

Application/Limitation

EMC Class A.

Type Approval documentation

Tests carried out

EMC, Dry heat & Vibration in accordance to DNVGL-CG-0339 Class A, Humidity/ Damp heat in accordance DNVGL-CG-0339 Class B. Type tests in accordance with IEC 60335-2-29.

Marking of product

CRISTEC – HPO12 or 24-XXX – charger input – charger output.

Periodical assessment

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

The main elements of the periodical 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 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 to be performed at 2 and 3.5 year and at renewal.

END OF CERTIFICATE