Marine & Offshore

Certificate number: 77041/A0 BV
File number: MPA2400643
Product code: 2899I

This certificate is not valid when presented without the full attached schedule composed of 7 sections

www.veristar.com

TYPE APPROVAL CERTIFICATE

This certificate is issued to

V.E.B.R.A.T.

SAINT-ANDRE-DES-EAUX - FRANCE

for the type of product

LITHIUM-ION BATTERY SYSTEM

K31 Battery modules.

Requirements:
Bureau Veritas Rules for the Classification of Steel Ships/Naval Ships/Inland Navigation Vessels.

EC Code: 41

For information only

This certificate is issued to attest that Bureau Veritas Marine & Offshore did undertake the relevant approval procedures for the product identified above which was found to comply with the relevant requirements mentioned above.

This certificate will expire on: 12 May 2030

For Bureau Veritas Marine & Offshore,
At BV SAINT-NAZAIRE, on 12 May 2025

This certificate was created electronically and is valid without signature

This certificate remains valid until the date stated above, unless cancelled or revoked, provided the conditions indicated in the subsequent page(s) are complied with and the product remains satisfactory in service. This certificate will not be valid if the applicant makes any changes or modifications to the approved product, which have not been notified to, and agreed in writing with Bureau Veritas Marine & Offshore. Should the specified regulations or standards be amended during the validity of this certificate, the product(s) is/are to be re-approved prior to it/they being placed on board vessels to which the amended regulations or standards apply. This certificate is issued within the scope of the General Conditions of Bureau Veritas Marine & Offshore available on the internet site www.veristar.com. Any Person not a party to the contract pursuant to which this document is delivered may not assert a claim against Bureau Veritas Marine & Offshore for any liability arising out of errors or omissions which may be contained in said document, or for errors of judgement, fault or negligence committed by personnel of the Society or of its Agents in establishment or issuance of this document, and in connection with any activities for which it may provide.

THE SCHEDULE OF APPROVAL

1. PRODUCT DESCRIPTION :

K31 Battery module for marine application. It mainly consists of 32 cells, 4 integrated slave BMS cards, 8 temperature sensors and 5 ventilation fans.

1.1 - K31 Module Specifications:

Parameter	Value	Condition
Output voltage	80-116.8 V	
Nominal Capacity	304 Ah	
Standard charge/discharge current	152 A	0.5C
Max Standard charge/discharge current	304 A	1C, 25°C
Max instantaneous charge current	608 A	60s, 2C, ≥ 30% SOC, 25°C
Max instantaneous discharge current	912 A	60s, 3C, ≤ 80% SOC, 25°C
Cycle life	4000 cycles 2000 cycles	at 25°C at 45°C
Ambient temperature	-20°C to +55°C	
Charging temperature	0°C to +65°C	
Discharging temperature	-35°C to +65°C	
IP protection	IP 44	
Signal(Slave BMS)	CAN bus	slave BMS

1.2 - Cell Specifications:

Parameter	Value	Condition
Cell Type	LF304	
Nominal Voltage	3.2 V	0.5C 2.5 -3.65V
Nominal Capacity	304Ah	0.5C 25±2°C 2.5 -3.65V
Weight	5.42 kg ±0.3 kg	
Standard Charge/Discharge Curren	152A	0.5C
Maximum Charge Current	304A	1C, ≤ 80% SOC
Maximum Discharge Current	304A	1C

For information only

1.3 - Slave BMS Specifications:

Parameter	Value	Comment
Type	DCB12-M	
Cells per card	5 - 12	Adjustable by jumper at input connector
Card voltage	4V - 55V	
Balancing current	0.45 A	balancing resistance = 7.8 Ω
Operating temperatur	40°C to 70°C	

1.4 - Ventilation Specifications:

Parameter	Value	Comment
Type	AF120	II 3 G Ex ec IIC T3 Gc
Nominal Voltage	24V	16 - 28 V
Speed	6500 RPM	PWM 100%, 25kHz

4. APPLICATION / LIMITATION :

4.1 - BV Rules for the Classification of Steel Ships/Naval Ships/Inland Navigation Vessels.

4.2 - Approval also valid for ships to be granted for the notations: **AUT-UMS, AUT-CCS, AUT-PORT, AUT-IMS, AUT-QAS, AUT-IAS & BATTERY SYSTEM.**

4.3 - BUREAU VERITAS Environmental Category, **EC Code: 41.**
4.4 - The equipment fulfils the EMC requirements for installation in General Power Distribution Zones.
4.5 - The installation and ventilation arrangement shall comply with the Manufacturer's recommendation described in the above-referenced documentation.
4.6 - Battery System Risk Analysis document (referenced in 2) should inform project-specific battery room risk analysis.
4.7 - For BV vessels with additional notation **BATTERY SYSTEM**, the documentation required on BV NR467, Pt C, Ch.2, Sec.7, Article 5 shall be submitted for approval.
4.8 - The battery system shall only be operated with a fire suppression system in accordance with Manufacturer's recommendation.
4.9 - Only Hardware and Firmware successfully tested together in compliance with the rules as referred to in cover page, according to the declaration of the manufacturer are covered by this certificate.
4.10 - Any modification of the hardware, firmware having an impact on the product performance or functionality has to be validated with type testing.
4.11 - The battery system must be installed in a space whose temperature is regulated in accordance with the installation manual.
4.12 - EX-certification is not covered by this certificate. Application in hazardous areas are to be approved in each case according to the Rules and Conditions for Safe Use specified in a valid Ex-Certificate issued by a Notified or Recognised Certification Body
4.13 - Equipment covered by this Type Approval certificate has been tested according to requirements of IACS UR E10 rev 9.

***** END OF CERTIFICATE *****

For information only