



Marine &amp; Offshore

Certificate number: 74748/A0 BV

File number: MPA2300562

Product code: 2899I

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

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## TYPE APPROVAL CERTIFICATE

*This certificate is issued to*  
**TRANSFLUID SpA**  
 Gallarate (VA) - ITALY

*for the type of product*  
**LITHIUM-ION BATTERY SYSTEM**  
 Transfluid TF-Lithium battery System

### Requirements:

BV Rules for the Classification of Steel Ships/Naval Ships/Yachts/Inland Navigation Vessels.  
 IEC 62619:2022.  
 IEC 62620:2014  
 EC Code:21

**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: 27 Jun 2029**

**For Bureau Veritas Marine & Offshore,**  
 At BV NAPOLI, on 27 Jun 2024

***This certificate was created electronically and is valid without signature***

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## THE SCHEDULE OF APPROVAL

### 1. PRODUCT DESCRIPTION :

Transfluid TF-Lithium battery System is a modular and scalable solution for battery-powered, hybrid vessels and off-shore units. The system consists in three basic battery modules 51.2V-210Ah, 102.4V-105Ah, 102.4V- 210Ah. They can be connected in series to form a string obtaining up to 409,6 VDC and/or paralleled up to 32 parallels to increase the total capacity.

All modules are equipped with integrated Battery Management System (BMS) that monitors relevant parameters, the modules are interconnected electrically and by means of a communication bus that provides an interface with external systems/control devices.

#### 1.1 - Cells

##### 1.1.1 - Single cell Specifications:

Producer	EVE
Product Model	LF105
Cell chemistry	LiFePO4
Nominal Capacity	105 Ah
Nominal Voltage	3.20 V
Weight	1.98 kg
Housing	Prismatic Aluminium case
Cycle Life	≥ 2000 cycles

##### 1.1.2 - Cells Assembly:

Product Model	G03072	G03075
Nominal Capacity	105Ah	210Ah
Nominal Voltage	25.6	12.8
Cells connection	8S1P	4S2P

#### 1.2 - Battery Modules:

##### 1.2.1 - Basic stand alone modules:

EnergyProduct code	Architecture	Nominal Voltage	Capacity	Energy	Cells Type	Firmware release
KBP0063042	single element	51.2 V	210 Ah	10.7 kWh	210 Ah	4.0.26
KBP0063046	single element	102.4 V	105 Ah	10.7 kWh	105 Ah	4.0.26
KBP0063053	single element	102.4 V	210 Ah	21.5 kWh	210 Ah	4.0.26

##### 1.2.2 - Basic Module Specifications:

Maximum Charging current	0.8C, 84A - 105Ah module; 168A - 210Ah module
Maximum Discharging current	2C, 210A - 105Ah module; 420A - 210Ah module
work temperature range	-10°C to + 45°C
External Box Material	Stainless steel AISI 316L
IP Grade Protection	IP65
Power Connection	Two connectors with interlock function for charge and discharge
User System Connection	Connector for communication, services and enable battery
Other	Heating system for operate at low temperature

##### 1.2.3 -Series of modules:

Product code	Architecture	Nominal Voltage	Capacity	Energy	Firmware release
KBP0063056	Series of 51,2 V-210 Ah modules	up to 153,6 V	210 Ah	up to 32.2 kWh	6.0.4
KBP0063054	Series of 102,4 V-105 Ah modules	307,2 V	105 Ah	32.2 kWh	6.0.4
KBP0063052	Series of 102,4 V-210 Ah modules	307,2 V	210 Ah	64.5 kWh	6.0.4
KBP0063055	Series of 102,4 V-105 Ah modules	409,6 V	105 Ah	43 kWh	6.0.4
KBP0063047	Series of 102,4 V-210 Ah modules	409,6 V	210 Ah	86 kWh	6.0.4

**1.2.4 - Parallels of above mentioned modules**

Product code	Architecture	Nominal Voltage	Capacity	Energy	Cells Type	Firmware release
KBP0063XXX	1S - 2 to 32P	51.2 V	from 420 to 6720 Ah	max 344 kWh	210 Ah	6.0.4
KBP0063XXX	1S - 2 to 32P	102.4 V	from 210 to 6720 Ah	max 688.1 kWh	105 or 210 Ah	6.0.4
KBP0063XXX	3S - 2 to 32P	up to 153.6 V	from 420 to 6720 Ah	max 1032,2 kWh	210 Ah	6.0.4
KBP0063XXX	3S - 2 to 32P	307.2 V	from 210 to 6720 Ah	max 2064,4 kWh	105 or 210 Ah	6.0.4
KBP0063XXX	4S - 2 to 32P	409.6 V	from 210 to 6720 Ah	max 2752,5 kWh	105 or 210 Ah	6.0.4

**1.3 - Control Modules:**

The parallel battery configuration requires an additional element with the specific function of control the whole system(MCR). When more than 8 parallels are required for the application one or more expanders modules (EXP) are added to the master controller. The expander has the same identical MCR enclosure, same connectors but there is no electronic inside and it is provided for easy plug and play connection

Module internal Code	MCR	EXP
External Box Material	Stainless steel 316L	Stainless steel 316L
IP Grade Protection	IP65	IP65
Connection from modules	Standard 4 expandable up to 8	Up to 8 channels for modules communication
Other	Intergrate the electronic control for parallel battery system	Electronic control not present, used only as port expander for multiple parallel battery lines

**4.APPLICATION / LIMITATION :**

- 4.1 - BV Rules for the Classification of Steel Ships/Naval Ships/Yachts/Inland Navigation Vessels.
- 4.2 - Approval also valid for ships to be granted with the notations: **AUT-UMS, AUT-CCS, AUT-FORT, AUT-IMS & BATTERY SYSTEM.**
- 4.3 - BUREAU VERITAS Environmental Category, **EC Code: 21**
- 4.4 - The equipment fulfils the EMC requirements for installation in General Power Distribution Zones.
- 4.5 - The installation shall comply with the Manufacturer's recommendation described in the above-referenced documentation.
- 4.6 - The Risk Analysis document (referenced in 2) should inform project-specific battery room risk analysis.
- 4.7 - The maximum charger of battery is limited to 80% of nominal capacity of battery.
- 4.8 - A special charger, fully managed by the battery BMS, is required for the charging. This will be selected by Transfluid according to the specific battery configuration to grant the max. charging current approved limits (according to TA.02.10)
- 4.9 - The battery system shall only be operated with a fire suppression system, for example a water mist system or a foam based system. The installation and arrangement shall be performed in accordance with Manufacturer's recommendation.
- 4.10 - The Documentation according the Battery System required on BV NR467, Pt.F, Ch.14, Sec.1 Battery System shall be submitted for approval for each Project.
- 4.11 - On Yachts, in addition of 4.10, the installation requirements on BV NR500, Pt.C, Ch.2 shall be taking in account and particular requirements from the Flag Administration.
- 4.12 - Only Hardware and Firmware / Software 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.
- 4.13 - Any modification of the hardware, firmware or software having an impact on the product performance or functionality has to be validated with type testing.
- 4.14 - Equipment covered by this Type Approval certificate has been tested according to requirements of IACS UR E10 rev 8.

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