Certificate no.:
TAE000053A

TYPE APPROVAL CERTIFICATE

This is to certify:

that the Li-Ion Battery System

with type designation(s)
Deep Blue Battery 80 (DB B80)

issued to
Torqeedo GmbH
Wessling, Bayern, **Germany**

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.

Issued at **Høvik** on **2025-10-01**
This Certificate is valid until **2030-09-30**.
DNV local unit: **Augsburg**

for **DNV**

Approval Engineer: **Andreas Andrecht**

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.

Product description

The liquid cooled Deep Blue Battery 80 (DB B80) System consists of one Junction-Box and selectable Battery Modules. Up to 4x parallel battery modules (each 79kWh) could be connected to a junction box which includes independent safety features and the user interface.

The battery module includes 108 cells of type C43F in series connection, which are manufactured within cell blocks. The battery is monitored and controlled by a central BMS architecture. All components for managing the battery module are integrated in a separate iBMS housing within battery module.

LFP Prismatic Cell

Cell Model (Part Number)	C43F (CB 43 A)
Rated Capacity	228Ah
Nominal Voltage	3.2V
Nominal Charge Current	46A / 0.2C
Nominal Discharge Current	46A / 0.2C
Max. Discharge Current	228A / 1C
Charge Cut-off	3.80V/Cell
Discharge Cut-off	2.00V/Cell
Over Temperature Alarm	56°C
Chemistry (Cathode/Anode)	LFP/Gr

Battery Module DB B80

System configuration	108S 1P
Energy (nominal)	79.2kWh
Energy (usable)	77.6kWh
Voltage (nominal)	348V
Voltage Range	270V - 389V
Thermal management	Active water/glycol cooling
DB B80 Continuous Discharge Power	79kW
DB B80 Continuous Charge Power	52kW
Cycle Life (25°C avg cell temp)	3000 cycles (80% retention) (+/- 2%)
Ingress Protection	IP67
Mass Battery Module	550kg
Dimensions Battery Module	1630 x 766 x 229mm
Article Number Torqeedo	**000-1543**
Hardware ID ONE/P/N	**000010878-Ax**
iBMS-Software Version	**8.2.1.6**
iBMS-Hardware Version	**5.1**

Junction Box

The junction box contains the power and communication interface of the battery system and has the following main functions:

- DC-fuse on +/- pole to each battery module
- independent overcharge protection devices (independent from BMS)
- Cooling leakage detection (Water sensor)
- Alarm Display via 3x LED lights

Ingress Protection	IP44
Dimensions Battery Module	500 x 400 x 188
Article Number	**000-01793**
Relay PCB - Hardware ID	**018-00450**
Sensing PCB - Hardware ID	**018-00459**
Water sensor	**015-00193**
Software Series ID - Junction Box	**N/A**

Battery System

Voltage	Modules parallel connected	Energy
348V	1	79.2kWh
348V	2	158.4kWh
348V	3	237.6kWh
348V	4	316.8kWh

Location Classes

Temperature Class	A
Humidity Class	B
Vibration Class	A
EMC Class	A
Enclosure Class	IP66/67

Application/Limitation

EES Space
The EES space shall comply with the requirements as given for design option 1 with integrated off gas duct.

Approval conditions

For each delivery to DNV class the following documentation of the battery system is to be submitted for approval:

Battery system

- Reference to this type approval certificate
- Copy of the safety description
- I130 Project-specific Battery System Block Diagram
- E120 Technical specification of the battery system that is subject for product certification
- E170 Electric schematic diagram of the battery system showing internal arrangement of battery modules, battery strings, switch unit, emergency stop and independent safety system
- Z060 Functional description, including a project-specific overall description of the battery management system
  - software and hardware versions of components
  - capacity calculations for the gas extract ventilation fan
  - other relevant information not covered by the safety description
- Z252 Test program for product certification, including routine tests specified in applicable rules
- Z265 Calculation report, documentation of the SOC and SOH calculation

The Type Approval covers hardware and software listed under product description.

When the type approved software is revised (affecting all future deliveries) DNV is to be informed by forwarding updated software version documentation. If the changes are judged to affect functionality for which rule requirements apply a new functional type test may be required and the certificate may have to be renewed to identify the new software version.

Product certificate
Each delivery of the application system is to be certified according to Pt.6, Ch.2, 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 certification, the clause for application software control will be put into force. The independent cell voltage disconnection is integrated in the system and is not required to be tested during certification. See DNV-RU-SHIP Pt.6 Ch.2 Sec.1, Table 7 Tests of battery systems, item 10.

Application software control
All changes in software are to be recorded as long as the system is in use on board. Documentation of major changes are to be forwarded to DNV for evaluation and approval before implemented on board.

Type Approval documentation

Tests carried out

Type tests for the battery system according to applicable DNV rules and standards as listed below have been carried out. DNV-RU-SHIP Pt.6 Ch.2 Sec.1 (Edition 2024-12), DNV-RU-SHIP Pt.4 Ch.8 (Edition 2024-07), DNV-RU-SHIP Pt.4 Ch.9 (Edition 2024-07), DNV-CG-0339 (Edition: 2021-08), DNV-CP-0418 (Edition: 2021-09).

The Propagation test has been passed in accordance to DNV-RU-SHIP Pt.6 Ch.2 Sec.1 design option 1 no propagation between cells.

Marking of product

The products to be marked with:

- manufacturer name
- part designation with name and number
- serial number
- power supply ratings

Manufacturer

Manufacturer Junction Box
Torqeedo GmbH, Einsteinstrasse 901, 82234 Wessling, Germany

Manufacturer Battery Module
Our Next Energy, Inc., 45145 W 12 Mile Rd Novi, Michigan 48377, USA

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