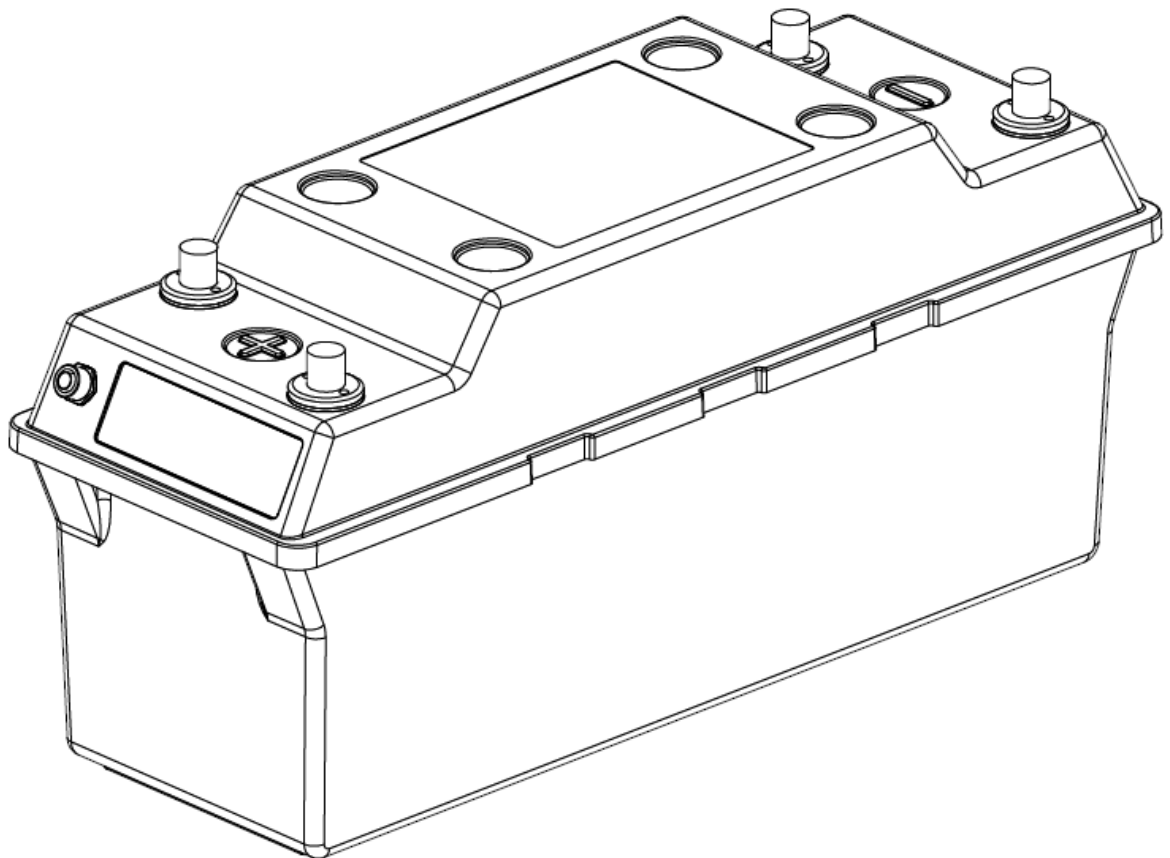


**Operation Manual for
Torqeedo Power 26-77**



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1. Introduction

Torqueedo Power 26 – 77 is a high performance battery for extreme applications.


In general they are used where ever low weight; high electric capacity and high current are needed.


The last generation of lithium-manganese cells (LIMA) is used in the Torqueedo batteries. Batteries with these cells offer the following advantages:

- **Increased energy density over lead batteries:** the high-power batteries of the Torqueedo Power range are lithium based and have an enormous energy density. This is a decisive advantage when you consider the limited volume and weight in the boat. There are also significant advantages over heavy lead batteries when it comes to handling.
- **Improved resistance to high current:** conventional batteries can only provide a fraction of their nominal capacity in the case of load in the typical power range of larger electric motors. Torqueedo Power batteries, on the other hand, never let you down even when faced with the utmost loads on a boat.
- **Higher charge stability:** Torqueedo Power batteries remain charged for several months even when they are stored. This is particularly important for the use of the electric drive as an auxiliary motor. Making it way superior to conventional batteries.
- **Improved performance in the cold:** lead batteries hardly perform at all at cold external temperatures. The Torqueedo power, on the other hand, releases practically its full power even at cold outside temperatures. This is a tremendous advantage should an electric motor be used in cold weather situations.
- **Higher safety standard than all other lithium-ion based battery systems:** the LIMA lithium-manganese cells used by Torqueedo are currently the only lithium-ion batteries which also withstand all safety standards when the safety electronics are switched off. Nevertheless, each and every cell of the Torqueedo Power battery has its own safety mechanism. Torqueedo is the first provider to make the LIMA cells available for boat drives.


2. About this operating manual


This operating manual will help you to use your Torqueedo Power safely and efficiently. All information is given accordingly to our latest knowledge and is subject to technical changes.

	Indicates a danger or a procedure that may cause injury and property damage.
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3. Safety instructions

	<ul style="list-style-type: none">• Please read this manual carefully and respect the safety instructions.• The connecting of several batteries must only be carried out by qualified personnel.• When connecting the motor or other electrical device only use suitable wire cross sections (see chapter „Installation“).• Please complete your electrical installation with a battery main switch, which is approved for at least 125A and a fuse of 125A or use a cable set that is equipped with both.• Please make sure that the junctions of the contacts are well done.• Protect Torqeedo Power against wet conditions.• Check the housing regularly for mechanical damages.• Only use charger, which are approved for lithium-ion batteries and respect the maximum final charge voltage and the maximum charge current.• Do not open or drill any holes in the housing.• Protect the Torqeedo Power battery against sliding and inclining.
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	<ul style="list-style-type: none">• Protect Torqeedo Power battery against direct sun exposure.• The battery should have a remaining capacity of 80% to 100% if you want to store it for a longer period of time.
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4. Conformity declaration

We, Torqeedo GmbH, with sole responsibility, declare the conformity of Torqeedo Power 26-77 with the following provisions:

Small water vehicles
Electrical system
Low voltage direct current (DC) systems
(DIN EN ISO 10133:2000)

Starnberg, May 2008

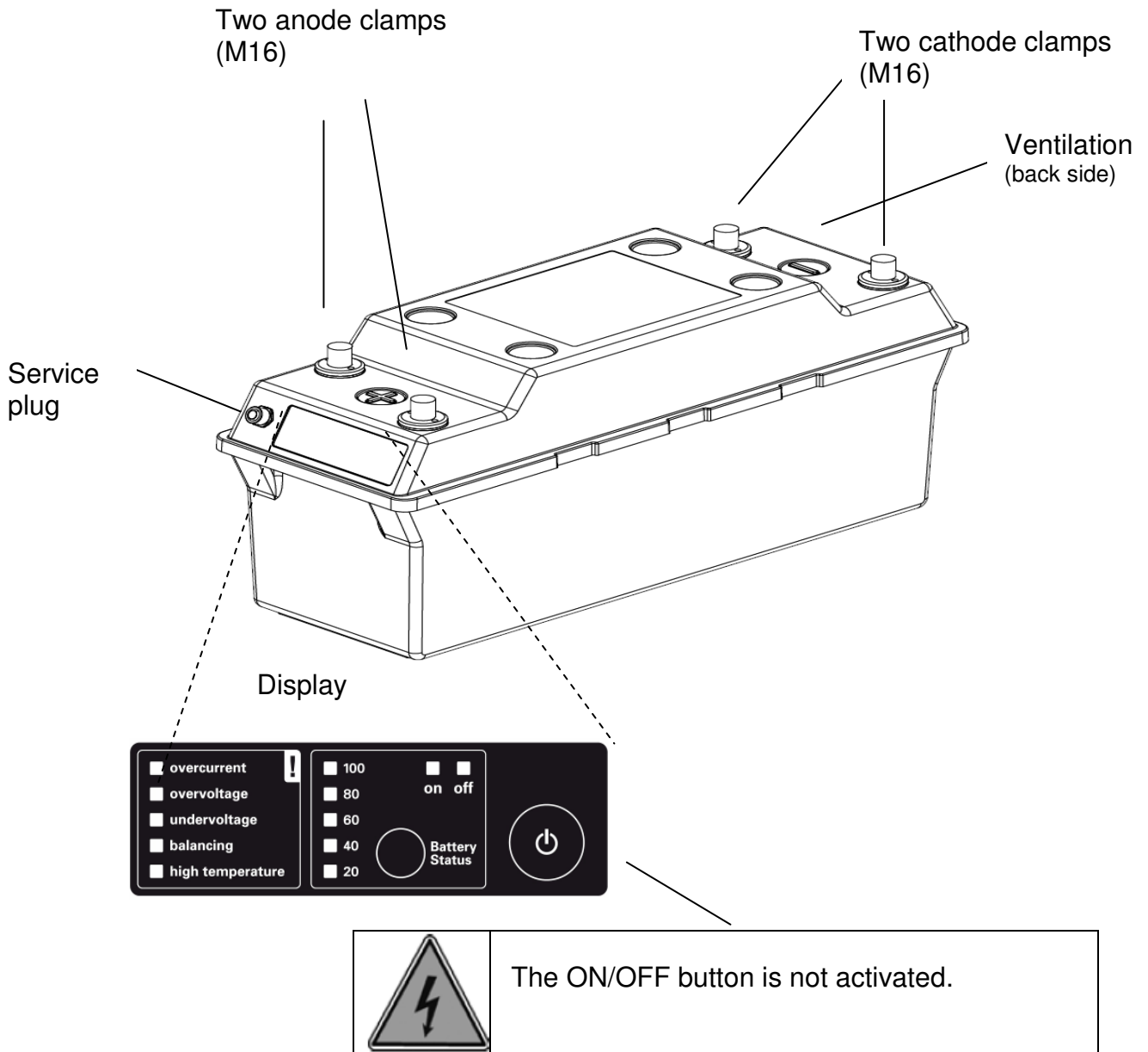


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Signature Managing Director

The above mentioned company has the following technical documents available for viewing:

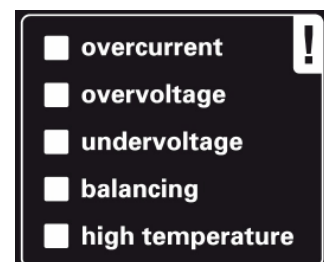
- Required operating manual
- Plans/software source code (EU authorities only)
- Inspection records (EU authorities only)
- Other technical documentation (EU authorities only)

5. Operating elements



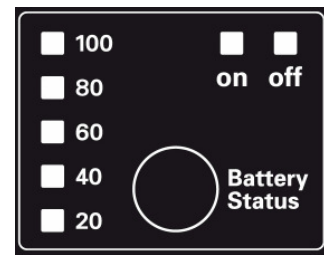
5.1 Status display

Overcurrent: not active
 Overvoltage: Voltage above 29.4 V.
 Undervoltage: Voltage below 17.5V.
 Balancing: not active
 High Temperature: The temperature of the battery is higher than 70 °C.



5.2 Battery state of charge display

LED	Description
20 blinking	Remaining charge below 19%
20 constant	Remaining charge between 20% – 39%
40 constant	Remaining charge between 40% - 59%
60 constant	Remaining charge between 60% - 79%
80 constant	Remaining charge between 80% - 97%
100 constant	The battery is fully charged (over 97%)



The LED's on and off do not have any function.

5.3 Ventilation

In order to avoid any over pressure Torqeedo Power is equipped with a ventilation on the backside of the hermetically closed housing and a hydrophobic membrane.

	<ul style="list-style-type: none"> • Do not damage the ventilation. • Do not cover the ventilation. • In case of damage please contact the Torqeedo Service.
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6. Installation

Only qualified personnel are allowed to install Torqeedo-Power batteries.

Please take care that the wire cross section corresponds to the mentioned values in the table.

Cable loss in Watts depending on wire cross section and length of cable.

For Torqeedo Cruise 2.0, 24V, 2.000 W

Wire cross section in mm²

cable losses < 2.5%

cable losses > 2.5%

We do not recommend using wire cross sections smaller than 25mm².

	50	35	25	16	10	6	4	2
Length of cable								
1	2,3	3,3	4,7	7,3	11,7	19,5	29,3	58,6
3	7,0	10,0	14,1	22,0	35,1	58,6	87,8	175,7
5	11,7	16,7	23,4	36,6	58,6	97,6	146,4	292,8
7	16,4	23,4	32,8	51,2	82,0	136,6	204,9	409,9
10	23,4	33,5	46,8	73,2	117,1	195,2	292,8	585,6


7. Charging

To charge the Torqeedo Power Battery please make sure to use only charging units which were approved by Torqeedo. In case you use a “none approved” charging unit the 2 year warranty will be voided.

Charging times of approved charging units:

Charge power	Charging times to 100%
450 W	approx. 4.8 h
900 W	approx. 2.6 h

Please respect the following security instruction independently from the used charger.

	<ul style="list-style-type: none">• Each cell must be charged separately in case of serial connected batteries.• Please make sure of sufficient ventilation in order to evacuate the generated heat.• Please make sure that the opening of the ventilation of the battery is not covered.• Please make sure that the connected motor or electrical device is switched off during the loading process.
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Please respect the following instructions for the Torqeedo charging unit:

1. Please connect the battery with the charger first.
2. Please plug the charger.
3. The charging process is starting automatically.
4. The charging process terminates automatically as soon as the battery is fully loaded (100%).

For any other charger please respect the operating instructions of the used charger.

8. Storage and care instructions

You can use all commercially available detergents, which are suitable for plastics for cleaning Torqeedo Power. Please use contact oil to service cathode and anode.

The optimal storage temperature is between 5° and 15°C. Please notice that the battery should have a remaining capacity between 80% and 100% if you want to store it for a longer period.

9. Technical Data

General Data	Value
Capacity	2,0 kWh
Charge	77 Ah
Rated Voltage	25,9 V
Final rated voltage	29,4 V
Maximum charge current	35 A
Maximum yield	3,1 kW
Maximum power consumption	120 A
Operating temperature	-20 °C to +65 °C
Optimal storage temperature	+5 °C to +15 °C
Ambient air temperature	0 °C to +45 °C

10. Disposal instructions



All Torqeedo products are manufactured in accordance with EU Directive 2002/96. This directive regulates the disposal of electrical and electronic devices for the protection of the environment.

You can, in line with regional regulations, hand in the battery at a collecting point. From there it will be professionally disposed.

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