



Original Battery Operating Manual

The manufacturer reserves the right to change the technical specifications of the equipment described in this manual.

The current version of the manual is available for download at www.seacraft.eu

The manufacturer shall not be held responsible for accidents and damage caused by misuse of the product, nor by its use in a manner contrary to or deviating from the rules set forth in this manual.

© Copyright by Marine Tech S.A.

The user manual is protected by copyright laws.

All rights reserved.

Manufacturer:

MARINE TECH SA,

ul. Franciszka Żwirki i Stanisława Wigury 17, 38-400 Krosno, Poland

www.seacraft.eu; office@seacraft.eu; phone: +48 502 741 715

NIP: 7811910188 | REGON: 361492147 | KRS: 0000557411

NCAGE: 99QRH | BDO: 000386158

About the document

Title: BATTERY OPERATING MANUAL

Release date: 02.01.2024

CONTENTS

INTRODUCTION.....	4
SAFETY.....	6
1.1 SAFETY OF USE	6
1.2 EMERGENCY MANAGEMENT	6
MODELS AND PARAMETERS	7
2.1 MODELS AND TECHNICAL PARAMETERS	7
2.2 OTHER PARAMETERS:	8
DESIGN AND OPERATION.....	9
3.1 THE 97 MODEL 97 – A SINGLE SEGMENT.....	9
3.2 DESIGN OF A SINGLE SEGMENT.....	9
3.3 750, 1000, 1500 AND 2000 UNIFORM BATTERY PACKS.....	9
3.4 CHARGING A SINGLE SEGMENT	10
3.5 SINGLE SEGMENT STATUS CHECK	10
3.6 SECURING A SINGLE SEGMENT	10
3.7 THE 600 AND 800 MODULAR BATTERY PACK.....	10
3.8 CHARGING THE MODULAR PACK.....	11
3.9 INSTALLING A MODULAR PACK IN THE UNDERWATER SCOOTER.....	11
3.10 BEHAVIOR OF BATTERY SEGMENTS DURING DISCHARGE.....	11
3.11 PROCEDURE FOR EQUALIZING VOLTAGE AND UNLOCKING SEGMENTS	12
3.12 STORAGE	13
3.13 MAINTENANCE.....	13
3.14 ENVIRONMENTAL PROTECTION AND DISPOSAL	13
3.15 WARRANTY AND POST-WARRANTY SERVICE.....	13
TRANSPORTATION.....	14
4.1 ROAD, WATER AND AIR TRANSPORT	14
APPENDICES.....	15

INTRODUCTION

Read the user manual before operating the battery.
Follow all guidelines, recommendations, dos and don'ts.
Safety guidelines apply to all types of batteries.

If you have any questions, please contact:
Marine Tech SA ul. Żwirki i Wigury 17 38-400 Krosno, Tel +48 502 741 715

This manual uses three types of markings, which have the following meanings:



WARNING

Indicates a procedure or situation that, if disregarded, could lead to equipment damage or a serious accident. It can also indicate incorrect and dangerous practices.



DANGER

Indicates a dangerous situation that, if not resolved, will inevitably lead to a serious accident, including the risk of death or disability.



CAUTION

Indicates a procedure or information that is important for the user

INTENDED PURPOSE

Batteries described in this manual are intended for use exclusively in SEACRAFT underwater scooters. Section 2 describes battery models along with their parameters and purpose. Use battery models suitable for underwater scooter models, as per the table in Section 2. Charge batteries using the correct charger type as indicated in the same table.

LEGAL COMPLIANCE

The manufacturer declares that the product meets safety requirements specified in the following European Union directives:

- RoHS Directive 2011/65/EU on the restrictions on the use of hazardous substances in electrical and electronic equipment

And regulations arising from harmonized standards and other technical standards.

MARKINGS

The following warning and information markings shall be used on the housing of a single battery segment and on the housings that constitute a uniform battery pack:



The CE marking – Conformité Européenne – signifies the manufacturer's declaration that the product is compliant with the essential requirements of the applicable directives and regulations.



The battery has been tested for compliance with the UN 38.3 transportation standard. Due to its capacity of less than 100Wh, the battery can be transported by air in carry-on baggage.



At the end of its service life, the product must not be disposed of together with other household waste.
It should be taken to a lithium-ion battery collection point.



Li-ion

Li-ion batteries must be disposed of in compliance with all applicable local and national regulations.
If not properly disposed of, they can cause danger to human health or the environment.



Li-ion batteries must be disposed of in compliance with all applicable local and national regulations. If not properly disposed of, they can cause danger to human health or the environment.



Important information!

The battery must not come into direct contact with water, moisture, or other liquids.
Read the manual before use! See the manual for information on use!



Do not overheat!

1.1 SAFETY OF USE



Lithium-ion batteries are among the most efficient types of batteries available on the market. This carries serious risks – the amount of energy stored in the batteries is sufficient to cause a fire, explosion, very high temperatures and other life and safety-threatening situations in the case of damage or misuse. It is imperative that the user follow these instructions for use and comply with the recommendations listed below.



When the battery was being designed, safety, convenience of use, and the ability to be transported by air were priorities. However, misuse can lead to serious injury, accident, disaster and death, so always strictly follow all of the following rules:

- Do not use batteries for purposes other than those specified in this manual.
- Do not use batteries in violation of the rules set forth in this manual.
- Do not use and do not transport batteries that show signs of mechanical damage.
- Do not place batteries in checked baggage; transport batteries only in carry-on baggage in manufacturer-dedicated packaging; protect batteries with caps supplied with the product.
- Only charge batteries using the original charger supplied by the manufacturer, in a carefully selected location, so that in the event of a malfunction or fire, there is no danger of the fire spreading, or danger to people.
- Do not store batteries in areas exposed to direct sunlight, in closed and unventilated spaces (such as vehicles), or in the vicinity of heating equipment.
- Do not allow direct contact of the battery with water, moisture, or other liquids.
- Do not allow the use of batteries by children and teenagers under the age of 18 and do not leave batteries unattended.

1.2 EMERGENCY MANAGEMENT

Retain the battery safety data sheet provided with the product. Be familiar with its contents and ensure quick access to the document.

In the event of a leak, contact with battery substances, or a fire, follow the guidelines set forth in the Safety Data Sheet, prepared in accordance with EC Regulation 1907/2006 (REACH), as amended.

MODELS AND PARAMETERS

2.1 MODELS AND TECHNICAL PARAMETERS

Description	Model	Total capacity (Wh)	Voltage (V)		Length (mm)	Weight (kg)	Charging current (A)	Charger type	Intended purpose
			min	max					
Single segment	97	97	26.0	37.8	250	0.54	≤1.5	not applicable	For modular packs 600 and 800
Modular pack	600	582 (6*97)	26.0	37.8	350	4.37	≤9	120W, 240W	Future; GO!
	800	776 (8*97)	26.0	37.8	350	5.45	≤12	120W, 240W	Future
A uniform battery pack	750	751	26.0	37.8	350	4.80	≤12	120W, 240W	Future
	1000	989	26.0	37.8	290	5.25	≤13	120W, 240W, 400W	Future
	1500	1510	26.0	37.8	290	9.44	≤20	120W, 240W, 400W, 900W	Ghost
	2000	2030	26.0	37.8	290	10.8	≤20	120W, 240W, 400W, 900W	Ghost

NOTE:

- The length of the batteries is given including the ballast mounting elements (pins), not including the flexible cables.
- The weight of the batteries is given without added ballast (ballast mounting elements).

2.2 OTHER PARAMETERS:

STORAGE TEMPERATURE

Recommended storage temperature: +10°C...+30°C (+50...+86°F). Storage of batteries at the recommended temperature guarantees:

- the longest possible charge retention period (lowest self-discharge);
- the longest possible battery life (highest number of charge/discharge cycles).

Maximum acceptable storage temperature (not recommended): -20°C...+40°C (-4...+104°F).

Storing batteries at an acceptable temperature guarantees no damage.

The storage period at the acceptable temperature must not exceed 3 months. A loss of stored energy of up to 20% of the total battery capacity is possible.

NUMBER OF CHARGING CYCLES

Each of the listed battery types can withstand a minimum of 300 full charging cycles using an appropriate charger.

The above statement is binding provided that the battery was discharged only through use in the scooter.

The total discharge time must not be less than 40 minutes. (The load must not be too high.) In addition, at no time during charging or discharging must the battery temperature exceed +50°C (+122°F).

NOTE:

- All values are rounded to 3 significant digits by using general rounding rules.
- Due to the wide range of parameters, details of the method used and possible changes in the measurement conditions (temperature, altitude, etc.) the values obtained during random measurement may differ from those specified by the manufacturer by up to 5%.

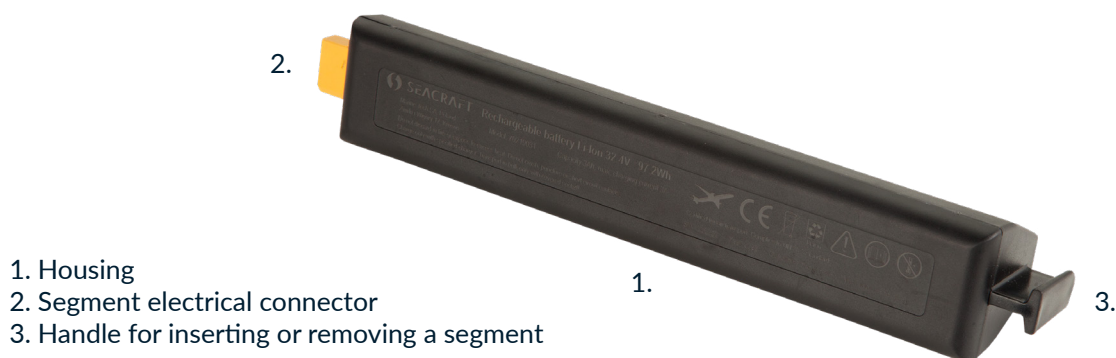
03

DESIGN AND OPERATION

3.1 THE 97 MODEL 97 – A SINGLE SEGMENT

The single battery segment is intended only for assembling battery modules for the 600 and 800 models and for installation in the GO scooter!

3.2 DESIGN OF A SINGLE SEGMENT



3.3 750, 1000, 1500 AND 2000 UNIFORM BATTERY PACKS

These models do not consist of single segments, but are a uniform, non-removable pack that is installed in the scooter as a single component. For guidelines on installation and removal, see user manuals for relevant water scooters.



3.4 CHARGING A SINGLE SEGMENT

Single segments can only be charged in the modular battery pack of the 600 and 800 models.

3.5 SINGLE SEGMENT STATUS CHECK



It is good practice to verify the voltages of individual battery segments each time they are reassembled. Each product containing single 97Wh battery segments as a power source is supplied with a voltage meter that plugs into the segment's electrical connector. Every time before inserting battery segments into the battery pack housing, verify the voltages of all segments – each segment separately – by plugging a voltage meter into the segment's electrical connector, and make sure that the voltage of individual batteries does not differ by more than 0.5V.

If there are differences and a segment needs to be recharged, proceed as described in Section 3.8.

3.6 SECURING A SINGLE SEGMENT



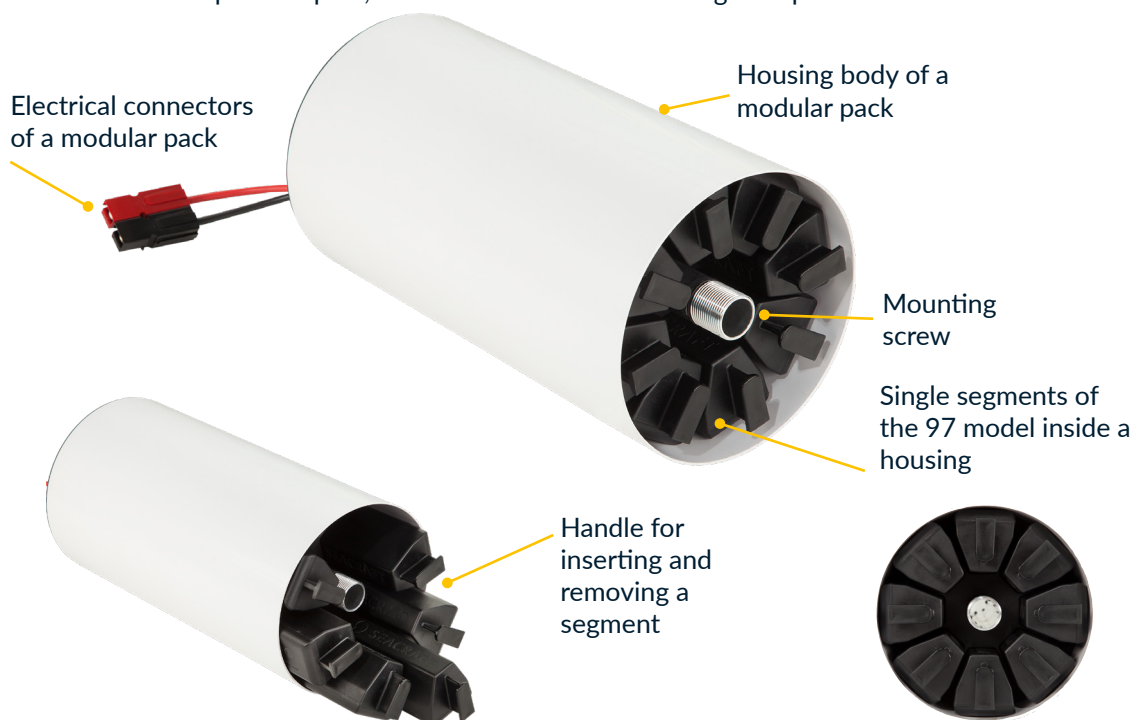
In order to protect the battery connector from potential short-circuiting, after disconnecting the battery, immediately put a protective cap on its connector.

3.7 THE 600 AND 800 MODULAR BATTERY PACK

The 600 and 800 battery pack is formed by a housing in which single segments of the 97-model batteries are placed.

The figure shows the 800 model with eight slots in which the batteries are installed. In order to install and remove batteries, use the handles to clip them in and out. The 600 model has an identical design and six slots filled.

Electrical connectors of the modular pack are used to electrically connect batteries to the scooter. The red connector indicates the positive pole, the black connector is the negative pole.



3.8 CHARGING THE MODULAR PACK

Seacraft underwater scooters are supplied with ready-to-use, installed batteries. The batteries are charged to about 30% for transportation. Before the first use, batteries should be charged to full capacity.

Before charging, read the charger's user manual and the charging instructions of the relevant product model.

When charging, the following rules apply:

- Batteries consisting of several segments of the 97Wh battery should be charged while installed in the product, together, using only original Seacraft chargers.
- Recommended charging temperature: above +10°C; charging at below the required temperature will block the batteries.
- Only a 240W charger can be used to charge one battery. Single segments should not be charged.

Single 97Wh segments have a built-in protection circuit, which, when another battery is added to the modular pack, checks the voltage of the next segment it is being connected to. If the voltage difference is less than 0.5V, the electronic circuits allow the two segments to be connected – and any minimal voltage differences equalize themselves (the segment with the higher voltage charges the segment with the lower voltage).

If the voltage difference is greater than 0.5V, the segment with a lower voltage is blocked.

Therefore, only connect battery segments with a voltage that differs by a maximum of 0.5V. Check segment status using a voltage meter, as described in Section 3.5.

3.9 INSTALLING A MODULAR PACK IN THE UNDERWATER SCOOTER

Carry out the installation as described in the user manual of the underwater scooter.

All batteries included in the above-mentioned products are matched to each other in terms of parameters and the manufacturing series of cells used. If you have several products containing 97Wh batteries, ensure their traceability – for example, by labeling or writing down serial numbers to avoid confusion.



97Wh batteries used with one scooter should not be mixed ("lent out") to another scooter. Such an exchange – while technically possible – is not recommended for a number of reasons.

If you make a mistake and connect batteries with different voltage levels, the lower-charged segments of the battery will be "blocked" and thus inactive. Always consult the manufacturer or an authorized service center before any addition of new battery segments or any replacement of damaged segments.

3.10 BEHAVIOR OF BATTERY SEGMENTS DURING DISCHARGE

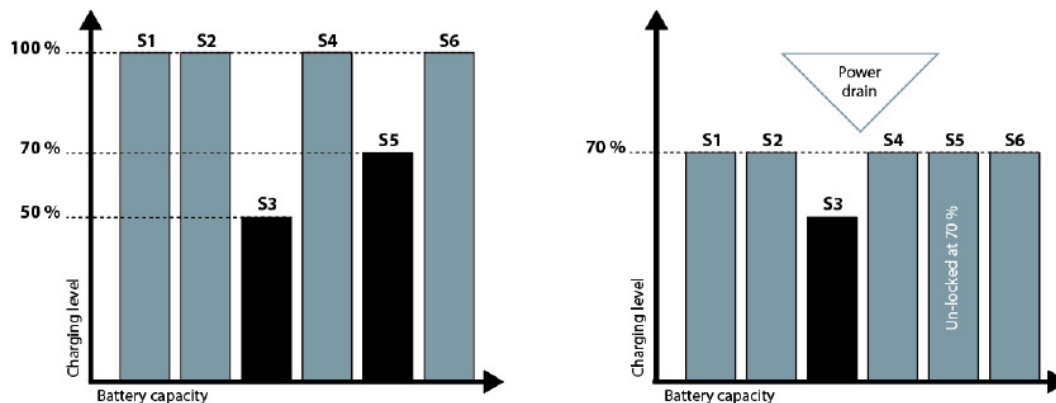
Correctly connected batteries with the same voltage level jointly release energy during operation and discharge evenly.

Connecting batteries with a voltage difference of more than 0.5V usually results in blocking the lower-charged batteries. The lower-charged batteries will remain inactive until their level is equalized while the scooter is in use.

This protects the battery from potentially dangerous phenomena as well as premature wear.

Example:

A user linked 6 segments without verifying their voltages. Segments S1, S2, S4 and S6 are 100% charged, segment S5 is 70% charged and segment S3 is 50% charged, as shown in the following image.



When the scooter is in use, its range and available maximum power will be lower than if the segments were connected using the correct procedure, however, it will still be possible to use the scooter.

When discharging the scooter, as the charge level reaches 70%, the S5 segment will be unlocked (as there is no segment with a higher voltage) and will release energy along with the other segments.

If the scooter is not discharged to at least 50% and the S3 segment is still blocked, connecting the charger may not charge that segment, and the scooter will only have 5 active segments out of 6.



If trying to use the scooter with only 1-2 active segments, the segments may be completely blocked due to the activation of overcurrent protection. This can manifest itself as a sudden shutdown of the scooter or a sudden change in the charge level on the display. The method of unlocking such a segment is described in Section 3.11. The blocked segment has no voltage at the electrical connector. Diving with blocked battery segments may reduce the operating time of the scooter or will prevent its use.

To unlock locked segments, follow the procedure described in Section 3.11.

3.11 PROCEDURE FOR EQUALIZING VOLTAGE AND UNLOCKING SEGMENTS

If you need to replace or unlock partially inactive battery segments, use a procedure that ensures that the product is fully charged – no matter what the voltage differences are or the number of locked battery segments.

To do so:

- Discharge all batteries used in the product to 0%; the best method is to discharge the scooter during use in the water until it automatically shuts down.
- Discharged batteries should be fully charged as per the procedures described in the manual.
- If unsure of the discharge status of the product, it is recommended to check the voltage of each battery after a full charge.

3.12 STORAGE

Batteries should be stored inside the product, in a dry and cool place, at a temperature of about +10°C. Storage at temperatures above +30°C significantly reduces battery life.

If batteries will not be used for at least 6 months, in order to preserve battery life:

- Charge them to about 50%.
- Disconnect from the scooter – in a manner appropriate for the model.
- Check the charge status – if the charge falls below 30%, the battery should be recharged to 50%. In optimum storage conditions, the discharge process takes several months, but if stored in unfavorable conditions (at high temperatures), a monthly check is recommended.



Batteries stored at full charge may be irreparably damaged. If a battery discharges completely, charge it to a minimum of 20-30% as soon as possible

For more information on battery storage rules, see the guide:

<https://support.seacraft.eu/knowledge-base/faq-scooters/>

3.13 MAINTENANCE

The product does not require maintenance other than the procedure for discharging and periodic charging, as described in this manual.

- Keep the product generally clean.
- Do not use running water for cleaning.
- Clean with a slightly damp cloth.
- Do not use detergents or solvents for cleaning.
- Dry the product completely after cleaning.

3.14 ENVIRONMENTAL PROTECTION AND DISPOSAL



Used batteries are hazardous waste. Never attempt to disassemble batteries yourself. At the end of their service life, batteries must not be disposed of together with other household waste. They must be taken to a collection point for used electrical and electronic equipment to be disposed of in accordance with applicable regulations.

3.15 WARRANTY AND POST-WARRANTY SERVICE

Each unit of the product comes with a manufacturer's warranty. Detailed provisions are specified in the Warranty Terms and Conditions available at <https://support.seacraft.eu/article-categories/warranty-terms/>. They define the manufacturer's obligations under the quality warranty, the temporal and territorial scope of the warranty, and the owner's rights under the warranty.

Any repairs to the product during the post-warranty period are offered for a fee. The manufacturer provides additional information with regard to problems users are able to resolve themselves. Users can take advantage of authorized service centers or service conducted directly by the scooter manufacturer.

Contact Seacraft service at: **service@seacraft.eu**.

04

TRANSPORTATION

4.1 ROAD, WATER AND AIR TRANSPORT

It is recommended to transport lithium-ion batteries at a low level of charge – 20-30%. This reduces the amount of energy stored in the batteries and the potential consequences of failure.

When transported by road or water, batteries should be installed inside the scooter.
The scooter housing is the best possible protection against impact and mechanical damage.
Follow the guidelines provided in the user manual for each model of underwater scooter.



Passenger air transport

Single segments of 97Wh batteries may be carried in carry-on baggage, as recommended by the IATA (International Air Transport Association, www.iata.org)

97Wh batteries have undergone safety tests in accordance with the UN 38.3 transport standard.

The IATA recommendations are not binding rules for airlines, and airlines have the right to determine their own carriage policies.

Check your airline's lithium-ion battery carriage policy before booking a flight.

Before traveling by air:

- Make sure you do not exceed the limit on the number of batteries per person; in most cases this is a total of 20 units of less than the 100Wh value.
- Remove the batteries, replace the caps provided by the manufacturer, and place the batteries in a dedicated shipping box.
- Bring the 97Wh battery description card supplied with the product.
- Ensure that the batteries are not subjected to falls, impacts or mechanical damage during transit to the airport.



97Wh batteries can only be carried in carry-on baggage. They are not allowed in checked baggage.

Upon arrival at the final destination, check the battery voltages and connect as per the instructions.
For current versions of documents, certificates, and advice on air travel with 97Wh batteries, see: <https://support.seacraft.eu/knowledge-base/flying/>

05

APPENDICES

■ Appendix 1 – Safety Data Sheet

MARINE TECH SA

ul. Franciszka Żwirki i Stanisława Wigury 17, 38-400 Krosno, Poland
www.seacraft.eu; office@seacraft.eu; phone: +48,502,741,715
NIP: 7811910188 | REGON: 361492147 | KRS: 0000557411
NCAGE: 99QRH | BDO: 000386158

