bw electronics GmbH

USER MANUAL EASYFOIL TWO

Version 2.3, June 2023

Introduction

Thank you for choosing EASYFOIL. We thank you for your trust and are pleased that you support our company. Our products are developed and manufactured in Germany.

If you have any questions or suggestions, please feel free to contact us, also visit our website: www.bw-electronics.de

Important notes

Please read this user manual carefully before using the product. The EASYFOIL TWO (also referred to as EASYFOIL or eFoil in the course) is designed to operate safely and reliably as long as it is used in accordance with the user manual. bw electronics GmbH accepts no liability for damage or injury caused by actions that conflict with this user manual. Check regularly on the homepage at www.easyfoil.eu/downloads that you are using the latest version of the operating instructions.

Observe the following instructions to ensure safe operation:

- Check the condition and function of the EASYFOIL before every trip.
- Leave the handling of the EASYFOIL only to adult persons who have received instruction in the operation of the product.
- Stop the motor immediately if you fall.
- Do not operate the motor if someone is near the EASYFOIL.
- Do not give full throttle, from a standstill. Start the engine slowly. Once the engine is turning, you can apply full throttle.
- Do not start the engine unless it is in the water.
- For safety reasons, always wear a helmet and life jacket.
- Always store batteries in suitable and safe containers.
- Do not open any parts that are screwed down, except for the parts explicitly described here in the user manual, as otherwise any warranty claim will be voided.
- Use the EASYFOIL only with all four quick-release fasteners
- In addition to these important instructions, read the entire user manual

Table of Contents

1. Product overview

1.1 Scope of delivery

The complete scope of delivery of the EASYFOIL TWO includes the following parts: (standard scope of delivery)

- Inflatable board (Inflatable) as well as an air pump and a repair kit for the Inflatable (without glue)
- Technical box with lid with quick release fasteners
- Mast with motor and mounting plate
- Li-Ion battery 28 Ah
- Charger 10A for the battery
- Remote control incl. induction charger
- EASYFOIL 6" propeller
- Motor control ESC built in technology box (Electronic Speed Control)
- Frontwing (2000 cm², 1600 cm², 1150 cm² depending on order)
- Backwing (400 cm²)
- Fuselage (attachment of the wings to the mast)
- Screw set
- Wing Bags

1.2 Identification

The nameplate of the EASYFOIL TWO can be found on the inside of the technical box.
You will find the fuselage number on the motor control unit housing.
The motor number is located on the connector of the cables on the mast.

1.3 Technical data

	EASYFOIL TWO Standard & Carbon
Maximum load	90 kg
Total weight ready to drive	Approx. 27.2 kg
Total weight for transport	30.0 kg
Operating temperature	5°C - 50°C
	Inflatable
Material	MSI Fusion Structure
Pressure	1.4 bar / 20 psi
Dimensions	Approx. 160 x 65 x 12 cm
Weight	Approx. 4,8 kg
	Technical Box
Material	GRP, CFRP, aluminum
Dimensions	Approx. 70 x 30 x 12 cm
Weight	Approx. 7.0 kg
	Motor
Maximum output power	3,600 W
Motor type	Brushless
Motor speed	5,900 min-1
Propeller diameter	approx. 15.3 cm
Dimensions	approx. 24.1 x 65.5 cm
Weight	approx. 3,0 kg
	Motor control (ESC)
Maxumum Output Power	3600W
Maximum current	74 A
	Remote control
Communication	Radio technology
Functions	Cruise control, battery level indicator, temperature indicator, rechargeable incl. charger, display 1.6".
Waterproofness	Tested according to IP67
Speed adjustable	stepless
	Battery (28 Ah)
Nominal voltage	48.1 V
Capacity	28.000 mAh
Energy	1.310 Wh
Battery Management System (BMS) functions	Balancing, short circuit protection, shutdown in case of overheating
Dimensions Approx.	29 x 19 x 8 cm
Weight	Approx. 6.0 kg
	Charger (10A)
Maximum power	600 W
Maximum current	10 A
Dimensions Approx.	Ca. 21 x 12 x 7 cm
Weight	Ca. 2,5 kg

1.4 Declaration of conformity

EG KONFORMITÄTSERKLÄRUNG

bw electronics GmbH
Eichbergstrasse 70
72525 Münsingen

Gegenstand der Erklärung:

EASYFOIL (elektrischer Foil)

Das genannte Gerät erfüllt die grundlegenden Anforderungen der Richtlinie 2014/53/EU zur Angleichung der Rechtsvorschriften der Mitgliedstaaten über Sportboote und Wassermotorräder und zur Aufhebung der Richtlinie 94/25/EG

Die Konformität des Gerätes, die Gegenstand dieser Erklärung ist, wurde in Anwendung der folgenden technischen Normen oder Vorschriften bewertet:

DIN EN 62479 VDE 0848-479 (2011-09-00)	DIN EN 301489-1 (2020-06-00)
EN 301489-17 V3.2.2 (2020-02-01)	EN55032:2015
EN 55035:2017	EN 61000-3-2:2014
EN 61000-3-3:2013	EN 60204-1
EN 300328 V2.2.2: 2019-07	

Münsingen, 8. Juni 2021

M. Walter
(Geschäftsführer: Mario Walter)

A. Bottlang
(Geschäftsführer: Alexander Bottlang)

2. Assembly and commissioning

2.1 Assembly of the EASYFOIL TWO

2.1.1. Connect Inflatable with the technique Box

Spread the Inflatable Board on the floor on a suitable surface and place the technique box from above into the hole of the Inflatable Board. Make sure that the cable grommet on the underside of the technology box is located at the rear end of the eFoil.

Now pull the board over the box from the bottom up. It may be helpful to inflate the Inflatable Board slightly to make it easier to pull the board over the box. If you still have difficulties, it is recommended to turn the board and the box upside down and carefully pull the board over the box with your feet.

Do not use sharp objects as this may damage the Inflatable Board. If necessary, rub the edge of the technical box with a little Vaseline.
Then inflate the Inflatable to approx. 1.1 bar / 16 PSI with the supplied air pump. If the resistance of the pump becomes too great, loosen the screw on the opposite side of the air outlet on the pump.

The resistance will now decrease and you can inflate the board to 1.1 bar. With the screw screwed in, you can inflate the board faster. (Double stroke)

2.1.2 Connecting the Mast to the technology Box

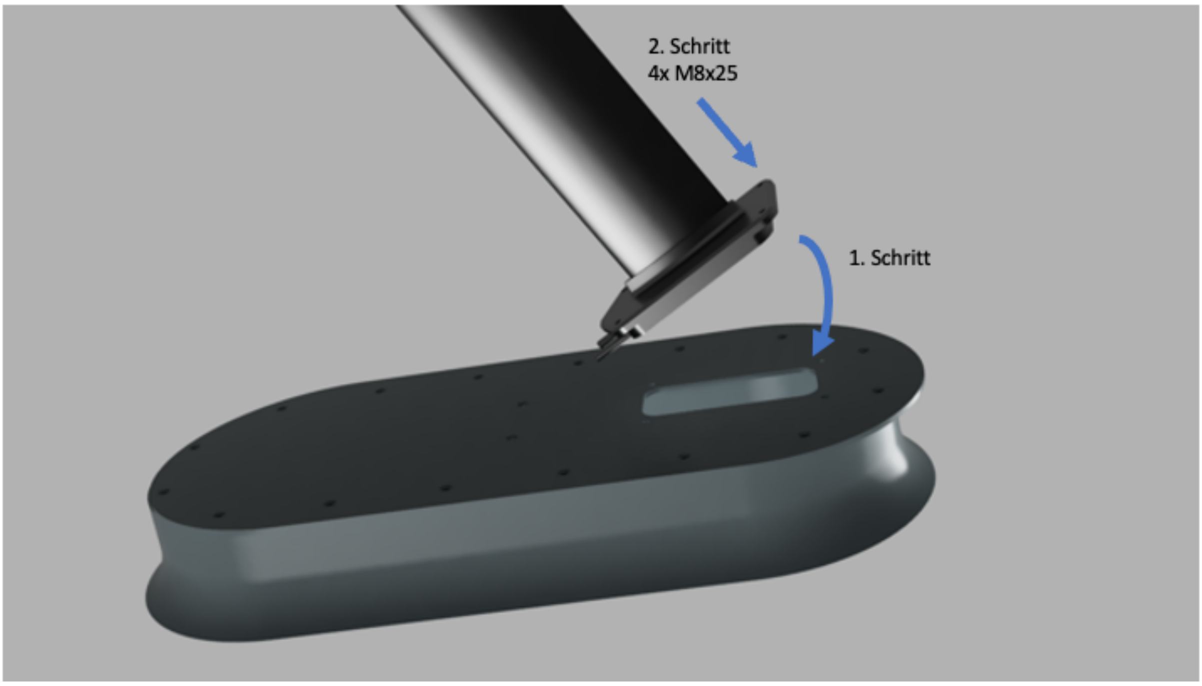

Figure 1

Now thread the cables from the mast through the opening in the bottom of the box. Then fasten the mast to the technique box using the four screws provided. The screws are screwed from the outside to the inside. (See Fig. 1) Also use a little grease on all four screws.
You can do this by placing the Inflatable with box upside down on the ground. Tighten all screws hand-tight and check them crosswise afterwards.

2.1.3 Connecting the Wings to the Fuselage

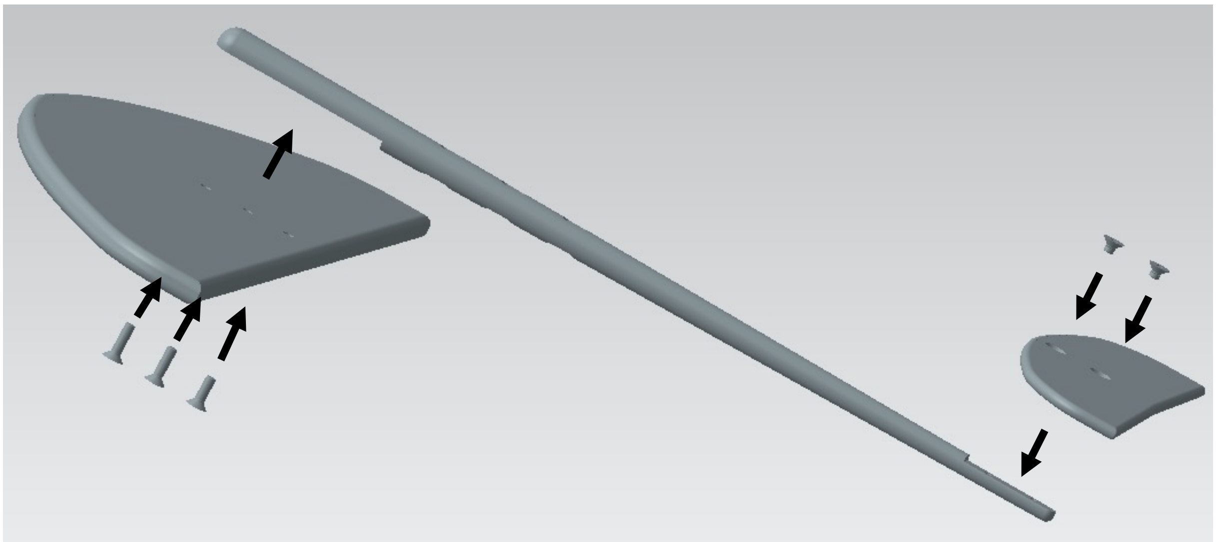

Figure 2

Now attach the front and back wing to the fuselage (Figure 2) with the enclosed screws. Use grease here as well before hand-tightening the screws.

2.1.4 Connect Wings and Fuselage to the Mast

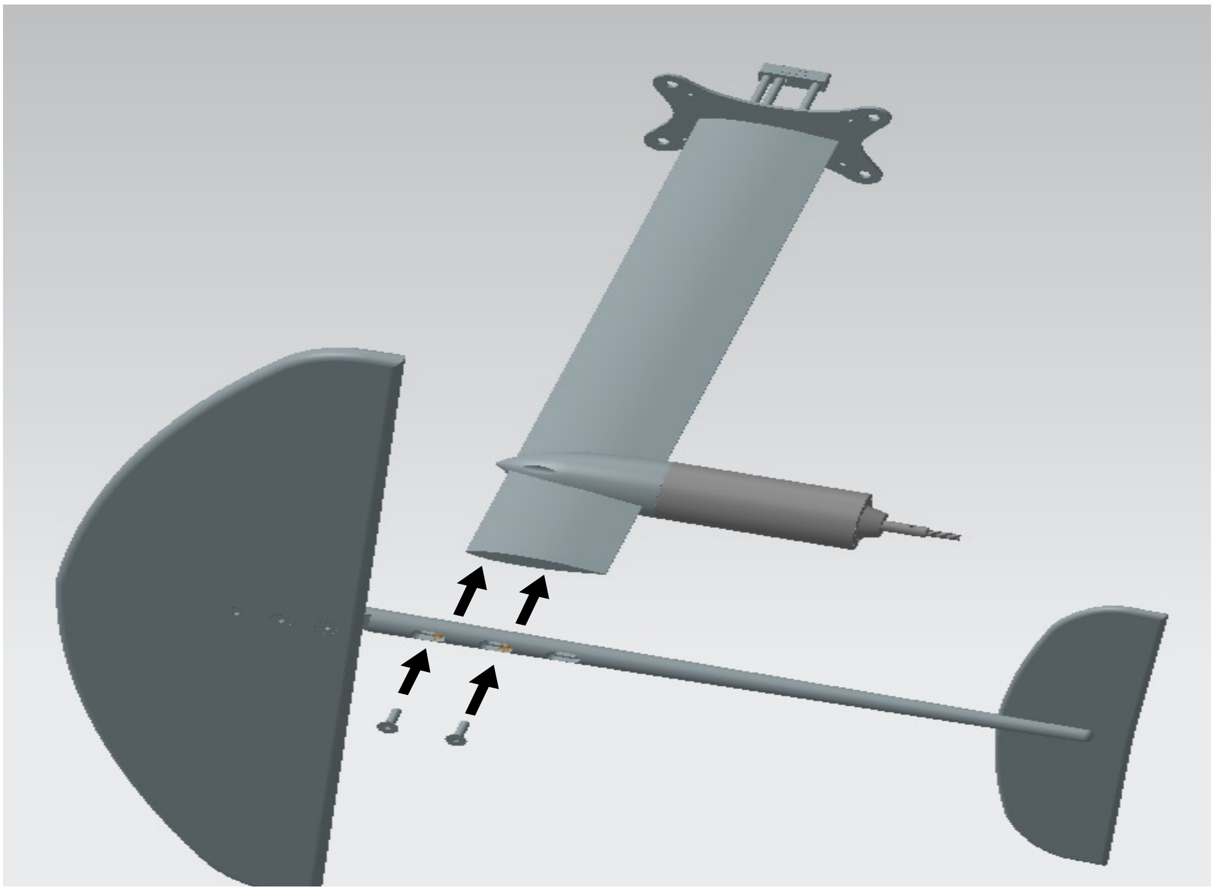

Figure 3

In the next step (Fig. 3), the fuselage is attached to the mast with two screws and connected to form the complete foil. Hand-tighten all screws, also using the wrenches provided.

Hint:

You can also perform steps 2.1.3 and 2.1.4 before step 2.1.2 and assemble the complete foil first, then place the foil on the ground and attach the board and box to the foil from above.

2.1.5 Mounting the Propeller

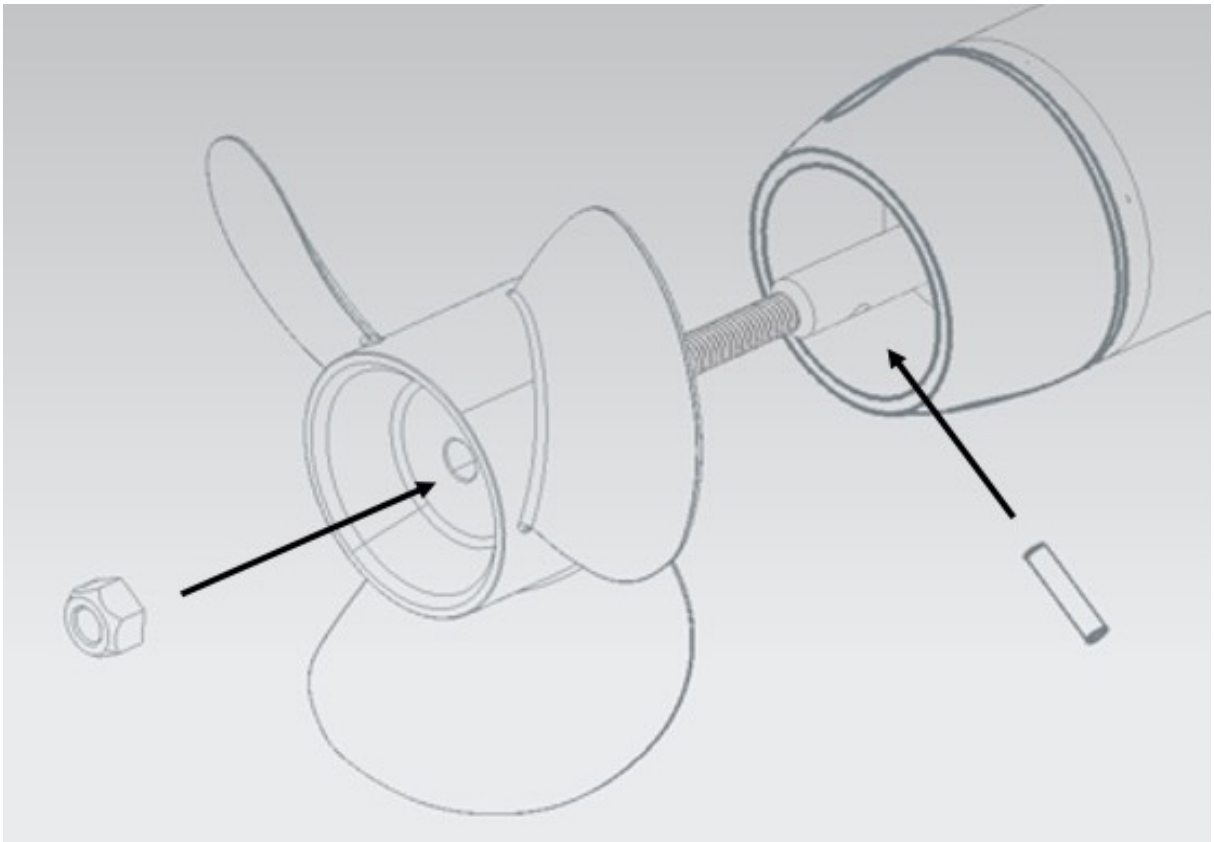

Figure 4

In the last step of the assembly, the propeller is mounted on the shaft of the motor. To do this, insert the enclosed locking pin through the opening in the shaft and attach the propeller to the shaft. Hand tighten the self-locking M8 nut using a suitable wrench. (See Figure 4) Also grease the shaft beforehand, this will make it easier to loosen later.

2.1.6 Inserting the Battery

Insert the battery into the front part of the box so that it clicks into place and secure the battery with the strap so that it cannot move inside the box while driving.
Do not connect the cable from the mast to the battery until commissioning, as explained in point 2.3.

2.2 Lid with quick fasteners

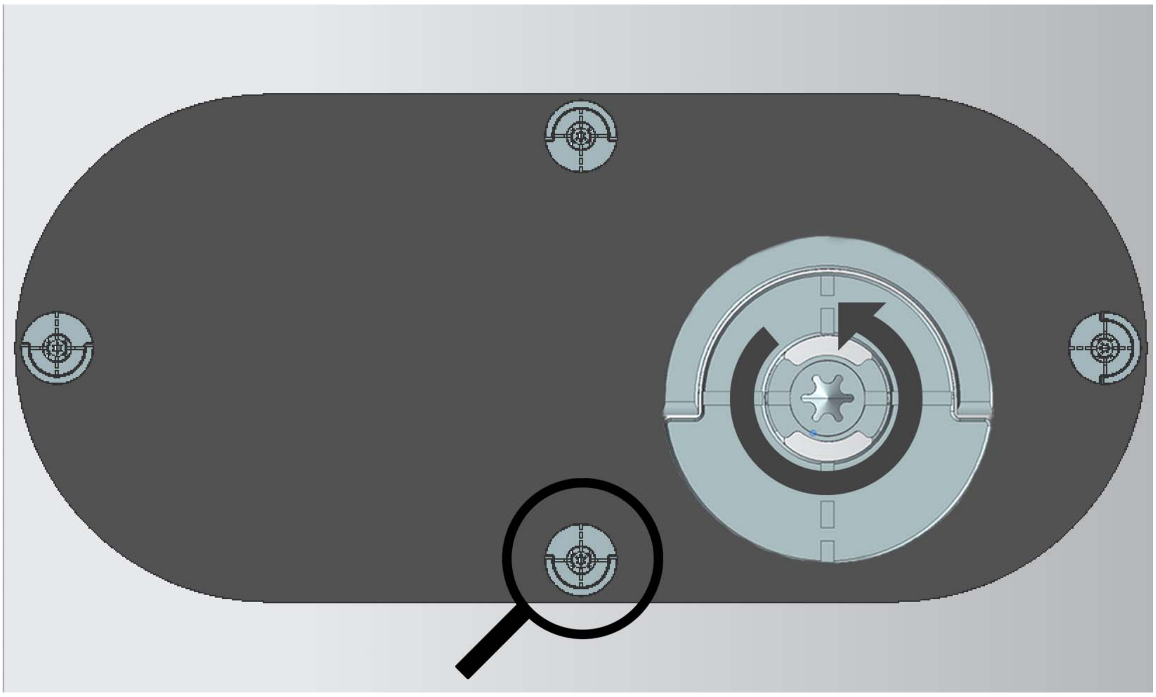

Figure 5

To open the lid, flip up the tabs of the four twist locks and turn them 90° counterclockwise. (Figure 5)

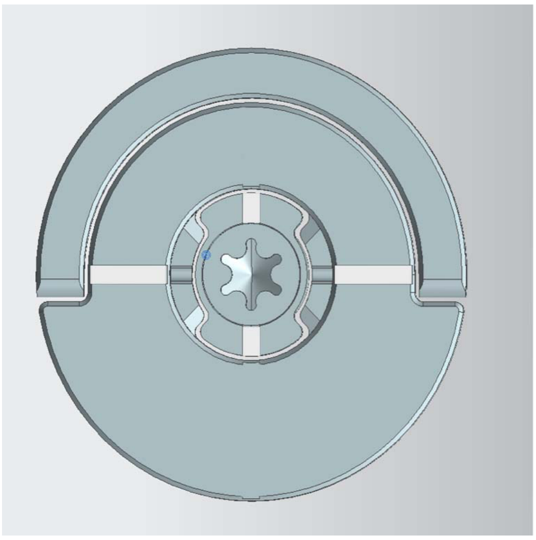

Figure 5 - open

To close, place the lid on the box and make sure that all four latches are open. Then press the lid lightly onto the box until it sits level on the box. Now turn the twist locks 90° clockwise until the white solid line forms a straight line with the lock. (Figure 7)

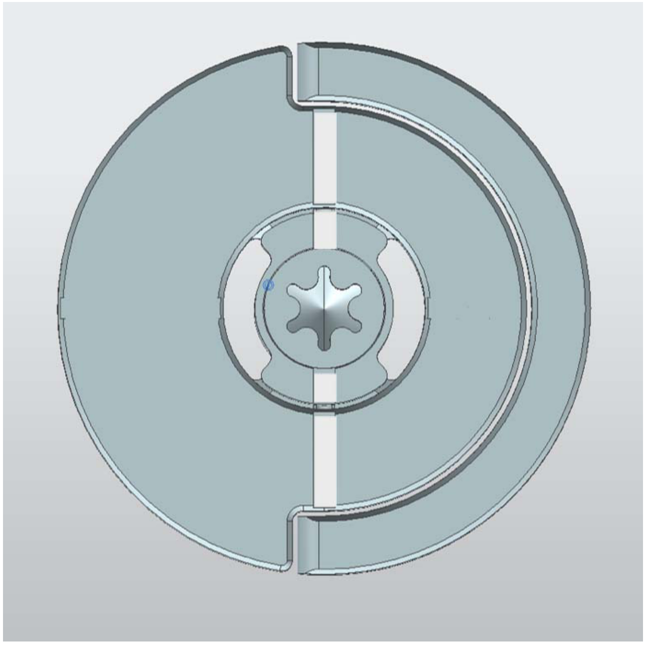

Figure 6 - closed

2.3 Commissioning

(1) Assemble the eFoil as described in section 2.1.
(2) Lightly grease all seals.
(3) Start the remote control as described in 3.4.
(4) Insert the battery and connect it to the cable of the ESC.
Make sure the connector is fully plugged in, otherwise a fuse will blow and the connector will be defective.
(5) If the remote control does not connect to the EASYFOIL, continue with point 3.4.2.
(6) Make sure to use the EASYFOIL only in waters which are deep enough not to damage the wing and motor. We recommend a depth of at least 1.25 m.
(7) Launch lying or kneeling on the board. Keep sufficient safety distance from the motor and propeller.
(8) Start slowly, operate the throttle with feeling and increase the speed slowly.

2.4 Operation with two rechargeable batteries

For operation with two batteries, please make sure that both batteries are fully charged. Connect the two batteries to the Y-adapter, which in turn must be connected to the motor control unit. The second rear battery must be inserted upside down into the technical box.

3. Functions

3.1 Charging the battery

Only charge the battery using the supplied charger or a suitable charger, which is available as an accessory. Only charge the battery under supervision.
Never charge the battery in direct sunlight. The optimum ambient temperature is around 25°C. If possible, avoid charging the battery in very cold or warm temperatures. Do not charge the battery immediately after use. The temperature may be elevated and may cause damage. Never charge the battery if it is damaged or dropped.
If the charger is connected to the power, LED 1 lights in red.
If LED 2 is lit in red, the battery is charging. As soon as the battery is fully charged, LED 2 lights up in green. The final charging voltage is 54.6 V.
You can check the voltage of the battery e.g., with a battery checker or a multimeter. Make sure that the plug on the rechargeable battery is fully inserted, otherwise the rechargeable battery may be damaged.

3.2 Storage of the battery

Storing the battery at the correct voltage ensures that the battery ages as little as possible. Batteries should always be stored in a cool, dry place and not fully charged. Not even if it is only over one night, the nights add up and lead in total to a damage of the battery.
For a short time, the battery can be stored at about 52.0V.
For longer storage, from about two days, a voltage of about 48.0V is recommended. Store only undamaged batteries and check the batteries regularly for voltage (weekly/monthly). Store rechargeable batteries in a safe place and in suitable, fireproof containers. The energy that escapes in the event of a fault is not insignificant in a rechargeable battery. The less energy there is in the battery, the less energy has to be dissipated in the event of a short circuit.
The rechargeable batteries have an integrated battery management system (BMS) and constantly compensate for the differences in the cells. This can cause the battery to discharge faster or slower. It is therefore important to check the voltage regularly to avoid damaging the batteries.

3.3 Battery disposal

Discharge old and worn-out batteries well below the storage voltage of 48.0V. Take the discharged battery to a dealer near you, to the dealer you trust or to a battery collection point, e.g., a recycling center. Never ship defective batteries.

3.4 Remote control

3.4.1 Switch on and off

Power on: Press the on/off button for 2 seconds, the remote-control screen will light up and the remote control will vibrate. Now the remote control is successfully powered on.

Unlock: Press and hold the Cruise Mode button for 3 seconds until the display shows "UNLOCKED".

Power off: Once the remote is powered on, press the on/off button for 2 seconds, the screen will show "POWER OFF" and vibrate briefly at the same time. The remote control is
is now turned off.
If you don’t use the remote control it will be turned off automatically after 10 minutes of inactivity (unless the remote control is in is in cruise mode).

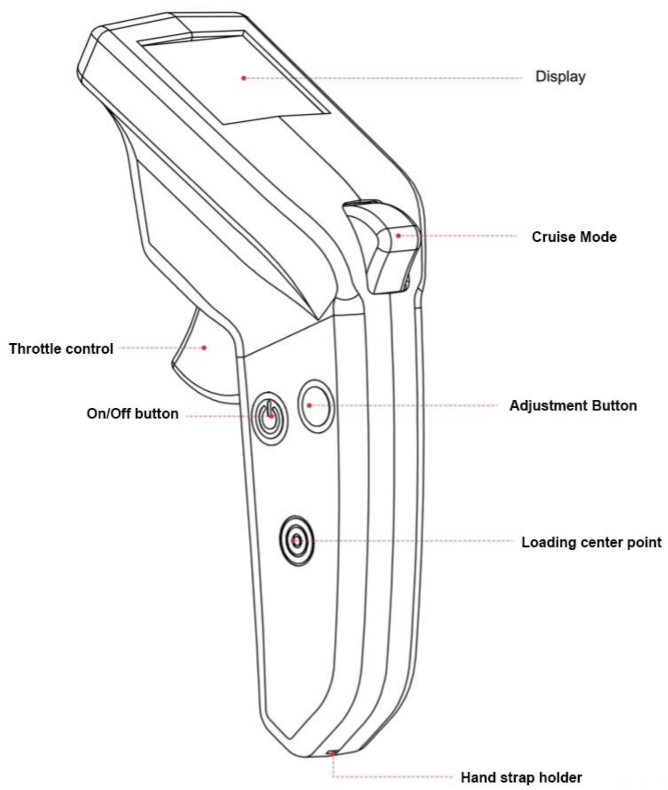

Figure 7

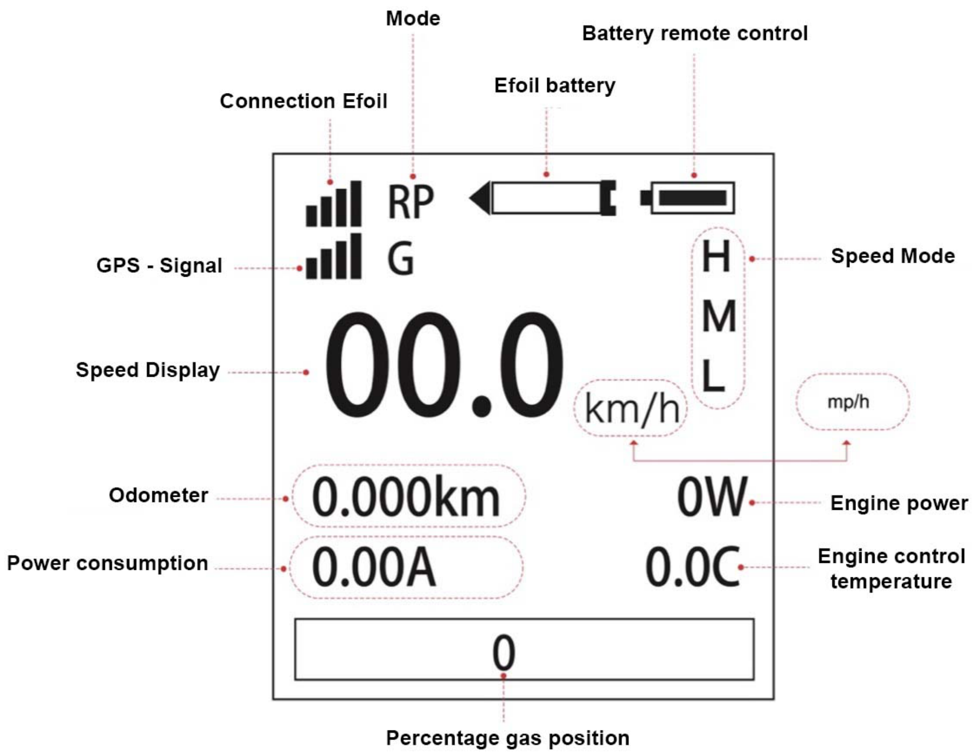

Figure 8

Important note:

Only change settings in the menu if you are absolutely sure what you are doing. Changing settings can result in problems using the EASYFOIL.

3.4.2 Connecting with the EASYFOIL TWO

When delivered, the remote control is already connected to the EASYFOIL. However, if the remote control should ever lose the connection, follow the steps below:

(1) The battery must be disconnected from the board for at least 5 minutes.
(2) Turn on the remote control.
(3) Press the setting button for 2 seconds.
By briefly pressing the adjustment button, you will move through the menu. As soon as the display shows "Pairing" you are in the right menu item.
(4) Now press the adjustment button again for at least 2 seconds and the lettering starts to blink.
(5) Now switch on the board. Connect the plug from the technical box with the socket of the battery. If the connection was successful, "Pairing succeed" appears on the display and by briefly pressing the on/off button, you can exit the menu item.

3.4.3 Connection status

The "RP" or "RU" at the top left of the display indicates that the remote control is connected to the board. There must be at least one bar and the RP (or RU), so that the functionality is given.

3.4.4 Accelerate and change speed mode

To accelerate, pull the throttle control back. The remote will display the throttle position (1-100) and the yellow progress bar will move from left to right the more throttle you apply.

Change to Speed Mode: Briefly press the adjustment button to switch between the three speed modes.

H Maximum speed
M Medium speed
L Low speed

Note: The remote control is set to maximum speed mode by default when it is turned on.

If you are foiling with your EASYFOIL, you can switch to cruise mode by pressing the cruise mode for three seconds.

This will then hold the engine power and the speed constantly for you and you don’t have to operate the throttle anymore.

Pressing any button will return you to normal mode.

3.4.5 Sensitivity level of the speed trigger

You can change the sensitivity of the remote control as follows.

(1) Turn on the remote control.
(2) Press the adjustment button for 2 seconds.
By briefly pressing the adjustment button you move in the menu. As soon as "throttle sensitivity" appears on the display you are in the correct menu item.
(3) Now press the adjustment button again for at least 2 seconds to change the set level with the throttle or cruise mode.
There are 4 different levels: 0, 1, 2 and 3. The higher the level, the more sensitive your remote control reacts to changes of the throttle.
(4) Once you have decided on a level, you can exit the menu item by briefly pressing the on/off button.

3.4.6 Switching between ESK8 and Esurf mode

Only Esurf mode should be selected here. ESK8 leads to malfunction with the EASYFOIL. (Esurf is set by default);

(1) When the "RP" in the upper left of the display is lit, press and hold the adjustment button for 2 seconds to set the remote control parameters.
(2) Briefly press the adjustment button again and then go to "Usage Scenario". The currently set mode is displayed under "Usage Scenario". Press and hold the adjustment button until the selected mode flashes, then press the throttle or press cruise mode to select the desired mode (Esurf is the surfing mode, ESK8 is the electronic skateboard mode).
(3) Press the on/off button briefly to confirm the setting, and then press it again to exit the setting menu.

3.4.7 ESC type selection

The remote control has 3 different types to choose from: "FSESC", "VESC" and "Non VESC". The default setting is "VESC".

To change the ESC mode:

(1) Press the adjustment button for 2 seconds.
(2) Press the adjustment button again briefly and then go to "ESC Type." VESC" appears on the display.
(3) Press the adjustment button until "VESC" flashes, then operate the throttle or press Cruise Mode to select the desired mode.
(4) Then press the adjustment button briefly to confirm your selection and press the on/off button to exit the settings menu.
(5) To ride the EASYFOIL you need the "VESC" mode.

3.4.8 GPS

The remote control has a GPS function. When the "G" appears in the upper left of the screen and the signal bars appear, it means that the GPS function is enabled.

(1) When the signal bars are grayed out, it means that no position data, speed data and distance data are received.
(2) The GPS function is activated when you select Esurf mode as in 3.4.6. and an ESC is selected. (VESC)

3.4.9 Parameter setting

(1) Press the adjustment button for 2 seconds and then briefly press the adjustment button again and then go to the parameter you want to change and hold the adjustment button for 3 seconds until the parameter flashes.
(2) Then you can use the throttle and the cruise mode button to change the parameter.
(3) When the parameter is selected, briefly press the on/off button to confirm it and when you briefly press the on/off button again, you will close the setting menu.

The following parameters should be set:
Battery cells the setting 13, Esurf mode, VESC mode.

3.4.10 Cruise Setting

When efoiling, press the cruise mode button for 3 seconds until the remote control vibrates to enter cruise mode.
Pressing a button again will exit Cruise mode.

3.4.11 Remote control charging

Charge the remote control via the supplied induction charger before use. Connect the induction charger to power via the USB cable and place the remote control on the charger.

3.4.12 Remote control security

Always carry the remote control with the supplied wrist strap. It is also used to prevent the remote control from sinking in water.

During operation, the remote control must be above the water surface. If the remote control is under water, it will lose the connection for safety reasons and the motor will switch off. As soon as the remote control and the EASYFOIL are above the water again, it reconnects automatically and can be used.

4. Checklist before use

(1) Make sure that all cables are properly connected.
(2) Make sure that all screws are tightened firmly.
(3) The direction of rotation of the propeller is clockwise.
(4) Make sure the battery and remote control are charged.
(5) Check the eFoil for leaks and use the EASYFOIL only if everything is tight.

5. Maintenance and storage

Check the EASYFOIL TWO regularly for damage or cracks. If you discover any damage, have it repaired by a specialist dealer.

Remove sand, dirt and salt water immediately. Dry all parts before stowing it away for storage. Store the EASYFOIL in a clean and dry environment and avoid direct sunlight. Be sure to disconnect the battery from the ESC before storage. Observe the storage instructions for the battery under 3.2. Grease all moving parts and seals regularly, especially the shaft of the motor.

Clean the EASYFOIL with clear water immediately after foiling, otherwise all parts will age much faster. All parts should be thoroughly and sufficiently rinsed with clear water. The battery, in particular the connection contacts, must not come into contact with water. The battery is only splash-proof.

Remote Control: It is recommended to wash it with fresh water or soak it in fresh water for at least one minute after using to reduce salt residue and extend the service life of the remote.

Replace defective parts immediately. Check the technique box regularly for leaks. Do not store the eFoil in direct sunlight, even for short periods of time. The dark parts, especially carbon parts can heat up very quickly and strongly and be damaged. If the battery is dropped or damaged, do not use it anymore and contact your dealer.

Do not start the motor unless it is in water. The shaft seal is not heat resistant. Dry running can therefore lead to overheating of the shaft sealing ring and thus destroy the seal of the motor and water can enter the motor.

Have an engine service performed by your specialist dealer after every season or after 50 operating hours.

6. Troubleshooting

This chapter describes the most common errors and how to fix them.

Error	Description & possible solution
Battery beeps	The supplied battery has an integrated battery management system that beeps when an error occurs. Check the voltage of the battery with a multimeter. If the battery has a voltage of less than 39 volts it will give a warning signal. In this case, charge the battery.
Water in the box	Make sure that the lid is properly mounted and all seals are in order. If the problem cannot be solved, consult a dealer. There is an arrow on the lid, it must point in the same direction as the arrow on the bottom of the technical box. Do not continue driving if you have had water in the box until the problem has been rectified. The warranty claim will otherwise be voided.
Remote control does not respond	Make sure that the remote control is charged and can be turned on. Check if the remote control has a connection to the board (display on the top left of the remote control) and if necessary pair it again as described in chapter 3.4.
Battery connector defective	The battery connector is defective, a "foreign body" can be seen. This is the internal resistor that prevents sparks when plugging in. The plug was probably not inserted correctly, which is why the resistor has burned out. Consult a dealer, the plug must be replaced in this case.
I can't get out of the water / motor has too little power	Check which setting is set in the remote control (L/M/H) see chapter 3.4.4. If the setting is correct, disconnect the battery from the EASYFOIL for 2 minutes and check the temperature at the bottom right of the remote control display. The temperature should not exceed 60°C. Try again afterwards. Have you already successfully ridden this setup (board, wing, weight rider) or have you changed something? The smaller the board and wings are and the higher the weight of the rider, the more energy and power you need and the more difficult eFoiling becomes. If the error is still not resolved and it is a technical defect, please contact a specialist dealer.
I have lost a quick-release fastener	Use the enclosed replacement quick-release fastener. Order replacement if necessary. Ensure that the fasteners engage and are tight during assembly.
Thread for mast mounting turns with	Use the enclosed 13 mm open-end wrench and tighten the screws. If necessary, hold it against during the mast assembly to prevent it from turning.
My mast wobbles	If the mast wobbles, immediately consult a specialist dealer or contact the service department. Further use may cause consequential damage. Do not use the EASYFOIL any longer, otherwise any claim under warranty will be void.
Ride feels wobbly/shaky	Check whether the mast of the EASYFOIL wobbles. To do this, place the EASYFOIL on its head with the mast pointing upwards. Now wiggle the mast slightly. If it wobbles, take the EASYFOIL to the service immediately. Also check that all screws on the wings are tight, including those on the fuselage towards the mast. If all screws are tight and the problem persists, go to the service immediately.