zeliox

ECO I / II / II+ / III user manual

eco I
eco II
eco II+
eco III

Table of contents

1. Use of the ECO

The Zeliox ECO is taking care of **collecting, storing** and **distributing** power, all packed into one device. **Simply** plug your tools and appliances into the front power socket or optionally, into other sockets in your vehicle. The **maximum available capacity** is depending on the ECO type (see chapter 6 for more details).
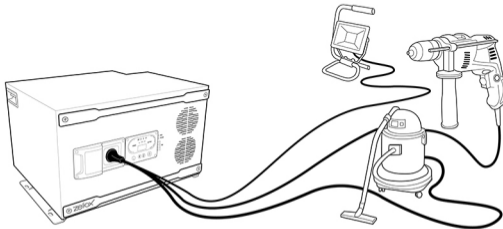
2. Keep your Zeliox ECO updated with the ECO-App

The app gives you **real-time information** on battery status, remaining battery time, charging details, current consumption, (dis-)charging history, battery lifetime and alarm events. You also can use the app to keep your ECO **up to date** with **new developed features** and the latest **firmware**.

Make sure that your **Bluetooth** is switched on.

Zeliox

Service portal

You can find us in Google Play store app or Apple store.

Menu / Alarms

Events / Functions

Current battery status

Current charging status

Current consumption

3. How to operate your Zeliox ECO?

Switch RCD ON (upwards) ①		
Front ON/OFF	**Remote Switch** (optional)	**Grid Charging**
Switch ON ②	Push ON ③	Auto ON ④
		Should your home grid not support 16A, then switch the Zeliox ON by hand.
Use front power socket ⑤		
Or use optional power sockets in the vehicle ⑥		
Switch OFF *(if not in use)*	**Push OFF** *(if not in use)*	**Auto OFF**
Warning: use the same switch (front or remote) to switch ON or OFF. Do not mix both switches.		

b) push button

c) switch RCD ON

C16

a) open door

POWER

BATTERY

○ RUN
○ ALARM

SOC

5
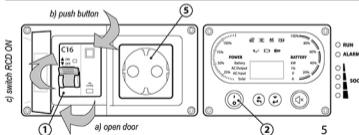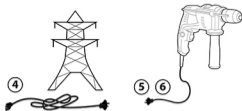
4. Explanation of the display

Normal statuses

Alarms

State of Charge (%)

The ECO is switched on

Current power consumption (%)

RUN

ALARM — Alarm indicator **

Battery low

SOC

Battery full

POWER
Battery
AC Output
AC Input
Solar

BATTERY
kW
Hz
V
A

100%
75%
50%
25%

60%
40%
20%

ON / OFF button *

Operating values
(in alternating sequence)

Browsing buttons
(up/down)

Beep on/off
(hold)
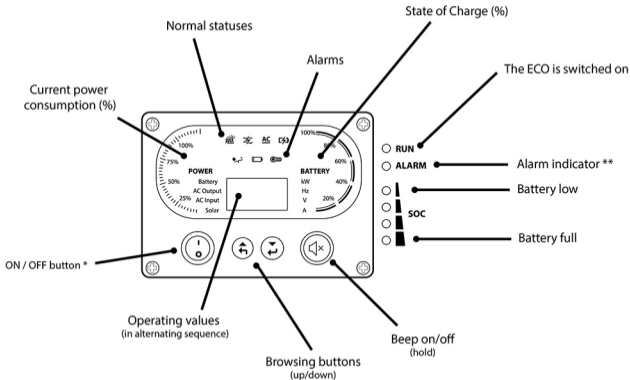
* See chapter 3 for combination with optional switch

** Consult user manual for detailed information

According to the current power, display as below:
0-25% display at 25%
25%-50% display at 50%
50%-75% display at 75%
75%-100% display at 100%
Overload display at full range

① According to the current SOC value, display as below:
When SOC 0%, no display;
SOC 0-20% display at 20%;
SOC 20%-40% display at 40%;
SOC 40%-60% display at 60%;
SOC 60%-80% display at 80%;
SOC 80%-100% display at 100%.
② When charging, the SOC light where it is located flashes, and it does not flash at 100%;
③ No flashes during discharging.

Display showing the various values, namely Battery, AC output, AC input and Solar with the corresponding unit (kW, Hz, V and A).

On/Off button, arrows for values, silent operating button.

When the Zeliox ECO has an alarm, MEZ displays ALM; and when ECO has fault, it displays Err.

State Of Charge;
1 LED = 0-25%, 2 LEDs = 25-50%, 3 LEDs = 50-75%, 4 LEDs = 75-100%

Solar on, the icon always on;
Solar off, the icon is off

Inverter on, the icon always on;
Inverter off, the icon is off

With AC input, the icon always on;
Without AC input, the icon is off

Always on when charging;
Off when discharging or standby

Flashes when the inverter is in overload alarm;
always on when the inverter is in overload protection

Flashes when the battery is in under-voltage alarm;
Always on when the battery is in under-voltage protection.

Flashes when the BMS board is in over-temperature alarm;
Always on when the SP/booster charger/inverter/BMS is/are in over-temperature protection

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5. How does your Zeliox ECO charge?

This will run automatically and the charging options are shown below.
The ECO App (see chapter 2) gives you detailed information on the charging.

|	**Drive charge**	Remark: Electric vehicles have a limited charging speed for accessories and is depending on vehicle make and type. PLEASE NOTE: During charging, the 12V output is activated and any connected loads are powered.
	Grid charge	Remark: When connected to the grid, the 230V inverter is switched off and a direct bypass is active. The RCD switch will protection against electrical faults. PLEASE NOTE: During charging, the 12V and 230V outputs are activated and any connected loads will be powered.
	Solar charge *(option)*	Remark: To harvest sun energy, optional solar panels and a MPPT-converter needs to be installed. Ask your installer for Zeliox approved products, for the highest efficiency. Charging speeds may vary, depending on the intensity of the sunlight. PLEASE NOTE: During charging, the 12V output is activated and any connected loads will be powered.

Important: If your Zeliox ECO is switched off, the **charging** process of the battery will run in the background. Charging will activate the **display** and power the **12V output**. Additionally if you charge from the grid, the **230V outputs** are activated. Keep in mind that any **loads** connected to these outputs, will be **powered** during the charging process!

The display will deactivate automatically when the charging process is finalized.
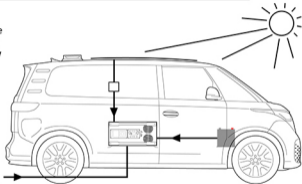
6. Zeliox ECO capacity and charging times*

zeliox

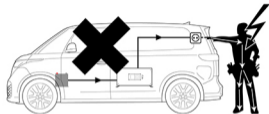|		eco I	eco II	eco II+	eco III
Power 230V		1600 Watt	2000 Watt	2000 Watt	3000 Watt
Battery capacity		1300Wh / 100Ah	1300Wh / 100Ah	2600Wh / 200Ah	2600Wh / 200Ah
Car **	charging power	426W	426W	852W	852W
	charging time	3h	3h	3h	3h
Grid	charging power	852W	852W	1420W	1704W
	charging time	1h30m	1h30m	1h45m	1h30m
Solar **	charging power	200Wp	200Wp	400Wp	400Wp
	charging time	6h25m	6h25m	6h24m	6h24m

* Exclusive external batteries
** See remarks chapter 5

7. What does the Zeliox ECO Insulation Guard do?

The Zeliox ECO is standard equipped with an insulation guard. When working in a mobile environment you are not earth grounded and thus not protected in case of short circuit due to moisture or cable damage. The Zeliox ECO insulation guard protects you against this risk.

Risk

- In a vehicle you are not earth grounded!
- In the event of a short circuit a RCD (circuit breaker) will not be activated
- The person will get an electrical shock or could get electrocuted

Working of an insulation guard

- It detects short circuits due to moisture or touching bare wires
- It automatically shuts down the Zeliox ECO
- In accordance with DIN VDE 0701/0702 and NEN 1010

Standard
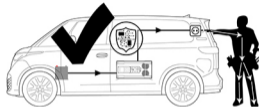
Zeliox ECO

8. What does the Zeliox ECO Heat Pack do?

The build in Li-ion battery in the Zeliox ECO has a special build in heating pack. Operating Li-ion batteries in low temperatures, could shorten the battery life significantly.

Below 5° Celsius, our heat pack will automatically switch on. The charging process will start, after it has heated up the battery cells sufficiently.

In frequent low temperature environments, we recommend connecting the Zeliox to the grid as much as possible and switch it off if not in use.
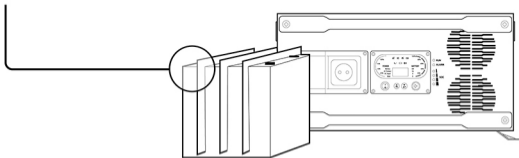
9. Prevent overheating!

Make sure that the front and rear ventilation openings are clear. Should the Zeliox ECO become overheated, switch the device off and let it cool down.
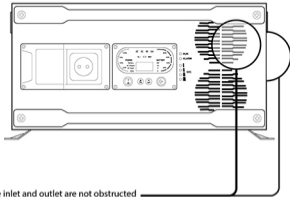
Make sure the inlet and outlet are not obstructed

10. In case of an Alarm

First look into the Zeliox ECO App to see what happend.

- Icon yellow warning triangle: Clicking will show the most recent alarm message.

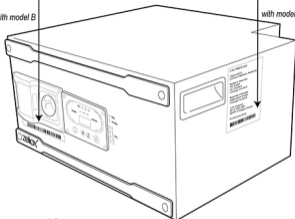- Icon Gear: Click and select "Events" for the full message history.

Still don't know what to do? Contact your installer or dealer.

Please note: when contacting your installer be sure you
have the **s/n serial number** of the Zeliox ECO.

only with model B

with model A and B

11. Compatible products

We have several products in our range that you can use to expand the Zeliox ECO system. All products have been extensively tested for quality and service life. They can be seamlessly connected to your ECO.

Solar Mate - SF100-30 (Art: ZEL-07-016)
Solar Mate - SF100-50 (Art: ZEL-07-017)

Solar Mate is a solar charge controller with built in Maximum Power Point Tracking (MPPT) technology, which can optimize the PV's output eliminate the fluctuation due to shading or temperatures variables. It tracked the maximum power point of a PV array to deliver the maximum charging current for battery, enabling PV array to increase the output by as much as 30% compared with PWM design.

SF100-30
SF100-50

- Maximum MPPT efficiency up to 99.9%.
- Maximum efficiency up to 98.2%.
- Excellent performance at sunrise and low solar insulation levels.
- High reliability with electronic protections.
- Wide MPPT operating voltage range.
- Forced charge mode.

COM SET BAT+ BAT–   PV PE PV+
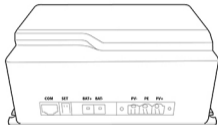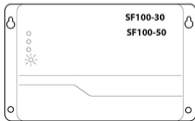
Extended Battery Pack M12-100 (Art. ZEL-ECO-BP-I)
Extended Battery Pack M12-200 (Art. ZEL-ECO-BP-II)

The M12 series is a 12V lithium-ion battery module. It configures high-performance and high-reliability BMS to effectively manage the cells, including cell over-voltage, under-voltage, charge over-current, discharge over-current, over-temperature, low temperature, short circuit and other protection functions. It also has built-in cell voltage balance, capacity calculation, SOC calculation, cycle life accumulation and low temperature heating functions.

- Long cycle life, over 3000 cycles at 100% DoD @25°C.
- Supports max discharge current 200A for M12-100 and 300A for M12-200.
- Built-in BMS with automatic balancing and complete protection.
- Built-in high precision (±0.1A) shunt for SOC calculation.
- Built-in heater element to support battery being charged at minus temperatures.
- Up to seven additional batteries can be connected to a Zeliox ECO.
- Plug & Play connection with all Zeliox ECO models.
- Make sure to extend the system in the same capacity as present in the Zeliox ECO (see also drawing below).

ECO I / II   1.3kWh + 1.3kWh = **2.6kWh**
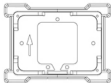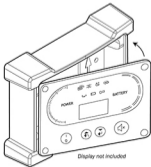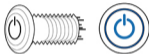
ECO II+ / III   2.6kWh + 2.6kWh = **5.2kWh**

Remote switch ON/OFF (Art. ZEL-08-015)

With the remote switch, placed on the dashboard, the Zeliox ECO can be switched on and off.

Please note: when using the remote switch, the on/off button at the ECO should remain switched off.

## Flushmount adapter for ECO display (Art. ZEL-OPT-027)

With the flushmount adapter, the ECO display can be placed on any other flat surface in the vehicle, for example a cabinet or wall.

The display can be unscrewed from the ECO. A replacement display is needed to close the remaining cavity in the ECO.

The flushmount can be glued or taped or screwed on the surface.

Display not included

Cover plate with 3m cable (Art. ZEL-OPT-023)

This plate will cover up the opening in the Zeliox, when the display is dismounted. The set also contains a 3m UTP cable to reconnect the display with the Zeliox.

blind plate

UTP-cable

Display not included
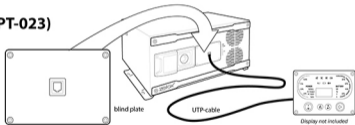
12. ZELIOX ECO SPECIFICATIONS:

ECO I / II   ECO II+ / III

Summary	Zeliox ECO I	Zeliox ECO II	Zeliox ECO II+	Zeliox ECO III
Power	1600W	2000W	2000W	3000W
Battery	1.3kWh-100Ah / Heat package / Battery expandable		2.6kWh-200Ah / Heat package / Battery expandable	
Outputs	1x 230V (front) | 1x 230V (rear) | 1x 12V (rear)			
Charging options	Alternator | EV | Solar Power | Grid Power			
Features	Automatic ECO mode if no power consumption (adjustable) | Power control function Power Control			
Safety	Isolation guard | Ground fault and overcurrent protection | Battery management system			
Interface	IOS-Android APP Bluetooth | Movable LED Display | Dashboard switch (optional)			
Warranty	5-year hardware and battery warranty			

Battery	Zeliox ECO I	Zeliox ECO II	Zeliox ECO II+	Zeliox ECO III
Capacity	1,3kWh		2,6kWh	
Current	100Ah		200Ah	
Type	Lithium 12,8V			
Composition	LiFePO4			
Self-discharge	Less than 3% per month			
Protection	Heat pack for charging at low temperatures			
Type of expansion battery	12.8V-100Ah | Discharge cont. 100A | Maximized 120A		12.8V-100Ah | Discharge cont. 100A | Maximized 120A	

Output	Zeliox ECO I	Zeliox ECO II	Zeliox ECO II+	Zeliox ECO III
AC 230V | Voltage	230V AC			
AC 230V | Frequency	50/60Hz			
AC 230V | Ampere limit	C16A			
AC 230V | Continuous	1600W	2000W		3000W
AC 230V | 10 min	1700W	2150W		3200W
AC 230V | 10 sec peak	1700W	2150W		3200W
AC 230V | Overvoltage peak	3200W	4000W		6000W
AC 230V | ECO mode	Automatic ECO mode if no consumption is detected (adjustable in Watts and Duration)			
DC 12V | Voltage	11,6-14,2V DC		11,2-14,2V DC	
DC 12V | Ampere limit	50 A Limited by connector			
DC 12V | Continuous	580-710W		560-710W	

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ECO I / II   **ECO II+ / III**

| Entrance	Zeliox ECO I	Zeliox ECO II	Zeliox ECO II+	Zeliox ECO III
AC 230V | Voltage		175-265V		
AC 230V | Frequency		45-65Hz		
AC 230V | Charging power	60A-850W	60A-850W	100A-1400W	120A-1700W
AC 230V | Power Control		Gives priority to consumer | Remaining capacity is available for battery charging		
DC 12V | Voltage		12-16V DC		
DC 12V | Continuous Power DC		30A		60A
DC 12V | Charge Power MPPT		50ADC | Maximized by connector		
Connections (plugs included)	Zeliox ECO I	Zeliox ECO II	Zeliox ECO II+	Zeliox ECO III
AC 230V | Mains input		Zeliox power cable Schuko-IEC		
AC 230V | Output		1x Schuko (front) / 1x IEC (rear)		
DC 12V | Starter battery input		SA50A Red (rear)		
DC 12V | Solar energy input		SA50A Blue (rear)		
DC 12V | Input Battery Expansion		SA120A Gray (rear)		SA175A Gray (rear)
DC 12V | Output		SA50A Gray (rear)		
Product Information	Zeliox ECO I	Zeliox ECO II	Zeliox ECO II+	Zeliox ECO III
Product weight	33 kg	35 kg	51 kg	54 kg
Weight including packaging	36 kg	38 kg	55 kg	58 kg
Product dimensions		W450 | H225 | D392 (mm)		W520 | H303 | D392 (mm)
Package dimensions		W525 | H305 | D485 (mm)		W595 | H385 | D485 (mm)
IP rating		IP20		
Temperature range		-20 to +60°C		
Operation consumption		15W		
Sleep Mode Consumption		Less Than 0.1 mA		
Cooling		Dual fans - forced air		

13. Zeliox APP | User functions & settings

13.1 User functions: Battery
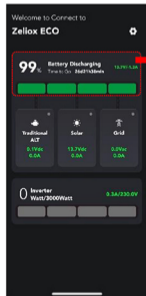
The marked area gives the real life battery information.

Click on it for more detailed information.
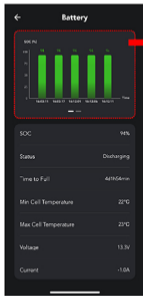
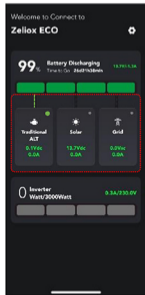This pages gives more details on the battery environment.

Among the SOC history. Slide in the marked area for more information.

The graph gives the history of the Amperage.
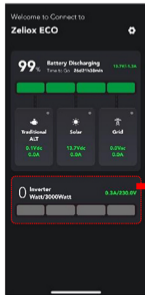
13. Zeliox APP | User settings

13.2 User functions: Charging

The marked area gives the real life information on the means of charging.

A green dotted line towards the battery area, marks that that charging method is active.

13.3 User functions: Consumption 230V

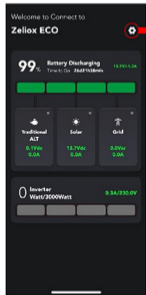*The marked area gives the real life information on connected 203V load(s).*
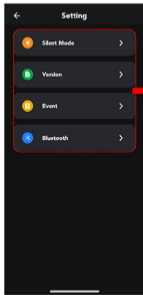
Click on it to for more information.

More detailed information on the connected load(s).
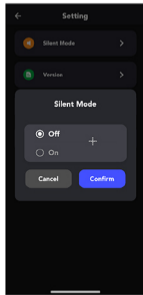
zeliox

13.4 User settings

Click on icon.

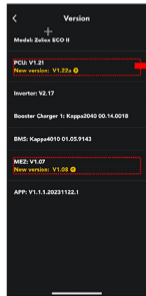Click on one of the menu buttons for more information

Silent Mode

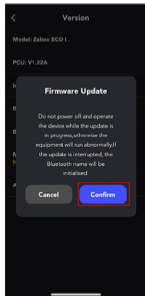**Silent Mode** give the option to switch ON/OFF the low battery alarm on the

13. Zeliox APP | User settings

Version

Event

Version gives information on software updates (marked orange). Click on it to update.
Please keep the phone near to the ECO when updating. Don't interrupt the updating process!

Click Confirm to start the software update.

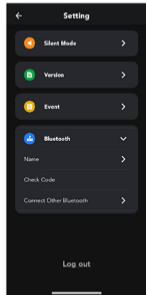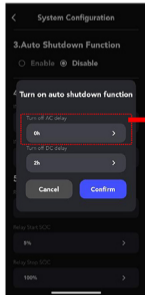**WARNING:** Some updates can take up to 15-30 minutes!

Event will give a full history on all activities since the device has left the factory.

13. Zeliox APP | User settings

Bluetooth

Bluetooth gives details on the current connection between the phone and the ECO.

13.5 Isolation errors combined with delayed AC shutdown

This is a screen shot from the engineering menu, which is accessible by your installer.

This information is only important if your installer has set a delayed auto shut off for the 230V outlets.

Should an isolation error occur within the delayed timer window, you cannot reset the error quickly, without disabling this function!

Follow the steps to reset the system:
1) Disconnect all 230V devices connected to the Zeliox
2) Turn off the Zeliox with the switch
3) Wait until the delayed timer setting has passed. Alternatively you can ask assistance from your installer to turn off the delayed timer setting in the engineering menu (see screen shot).
4) After switching on again, the isolation error message should be cleared
5) When you connect the devices one by one to the Zeliox, you can check where the insulation error has occurred

14. Disposal or recycle

Disposal and recycling of lithium batteries should comply with local, state, and federal laws and regulations. Mixed treatment with other (industrial) waste is prohibited.

Keep the orginal packaging, in case of return shipment

zeliox

CE

RoHS
2011/68/EU

IP21

Service portal

For more specifications see www.zeliox.com