User & Installation Manual

Zeliox Compact

ENGLISH

zeliox®
EXCESSIVEPOWER

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Information contained in this document may be changed without prior notice.

Introduction

This manual includes both a user and installation guide

Definition
Welcome to the world of Excessive Power: Zeliox Compact.
The Zeliox Compact is a battery powered mobile power converter designed for use in vehicles, vessels, tiny houses etc. The inverter supplies different output voltages, 5V, 12V and 230V. The Zeliox Compact functions are highly reliable and quiet, without the emission of harmful substances.

Zeliox Compact types:
This user manual is for the Zeliox Compact:

Zeliox Compact

ZEL16-1,20-EU	1600Watt – 1.2kWh - shore power

Dimensions and weight

Dimensions	420 x 190 x 370 mm (l x h x d)	
Weight	ZEL16-1,20-EU	23 Kg
	ZEL16-1.20-EV	22 Kg

Product identification
Zeliox Compact - lithium-ion battery powered inverter

Product Identification Number (PIN)
Unique serial number on the side, in the format: ZC-XX-XXXX
(for example , "ZC-20-0001")

Initial supplier identifier
Zeliox BV
Spaarpot 13,
5667 KV, Geldrop
www.zeliox.com

Telephone number
0031 40 3400 383 General / Sales
0031 40 3400 384 Service

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Warnings

WARNING:

- Do not use the Zeliox Compact without fully reading this user manual.

WARNING:

- This is a category C2 UPS product.
- In an inhabited area, this product can cause radio interference, in which case the user should take additional measures.
- This is a Class I product. Only connect a 230V from a source that is grounded, including any extension cords.
- This is a Class 9 (hazardous materials UN3481) electrical device, this means that it is a power source with high energy density and hazardous materials in a sealed metal housing.
- Make sure that the installation of the Zeliox Compact meets the IP20 requirements, the lowest degree of protection of the Zeliox Compact is IP20.
- The Zeliox Compact may only be used by qualified and trained users.

WARNING:

- Check that the Zeliox Compact is not damaged during transport. If damaged, contact the supplier.
- Disable the Zeliox Compact completely (on/off switch) and check for dangerous voltages before changing a connection.
- Make sure that the Zeliox Compact is connected correctly and according to the instructions for use.
- The installation must be done according to the national guidelines.
- The installation must be carried out by professional installers only.
- When installing, national security regulations must be strictly followed, in accordance with the final application requirements for housing, installation, spacing, clearance, markings and separation.
- Heavy inductive loads can cause damage to the Zeliox Compact. Additional optional measures are needed for this type of high loads.

For more safety information, see Appendix II – MSDS (Material Safety Data Sheet pag. 32-40).

Notes

Please note
- Do not submerse in water.
- Do not short-circuit.
- Do not open the Zeliox Compact.
- Do not discharge the Zeliox Compact before fully charging it.
- Charge only within the indicated limits.
- Keep the Zeliox Compact turned off during movement and installation.
- Do not place the Zeliox Compact upside down or on its back.
- Do not switch the Zeliox Compact in series or in parallel.
- Do not place unprotected against weather influences.
- Do not cover or block the fan air intake/outlet.
- Do not plug into its own socket.

Risks in case of fire:
- Risk of explosion.
- Decomposition by fire or heat with formation of toxic and stinging gases.
- Combustion gases that are highly irritating to the eyes and respiratory organs.

General measures to be taken by the driver when these risks occur:
- Turn off the engine.
- Place a warning signal on the road to warn others.
- Inform others of the risk and make sure you stay out of the wind.
- Call the police and fire department immediately and mention that there are lithium batteries (UN3481) on board.

In case of fire:
- Ventilate.
- If possible, immerse the Zeliox Compact completely in water.
- When extinguishing with water, fluoride, phosphate, oxygen fluoride and carbon oxide are formed.
- Possibly extinguishing with a carbon dioxide extinguisher.

NON SPILLABLE
LI-ION BATTERY

User Manual

Zeliox Compact

ENGLISH

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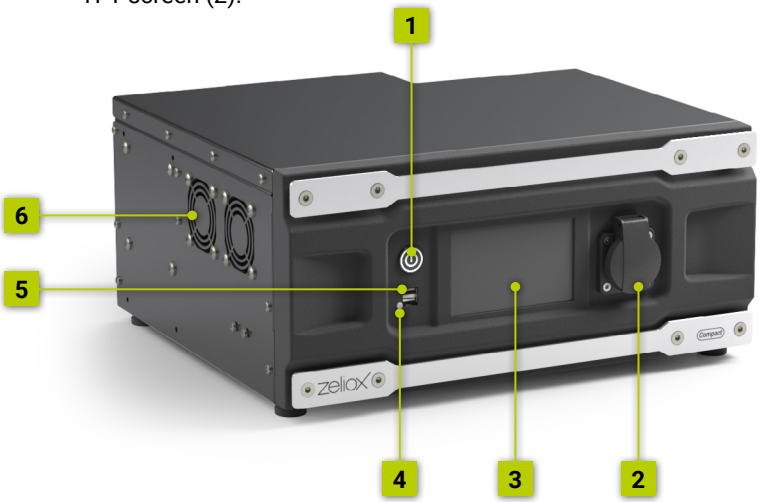
EXCESSIVEPOWER

1. Operation

1.1 Operation Zeliox Compact

To operate the Zeliox Compact push the on/off switch with LED (1) and the TFT screen (2).



1. On/off switch
2. Socket outlet
3. Control screen
4. Light sensor
5. USB type A 5V 2A
6. Fan air

1.1.1 On/off switch

With a push of the on/off switch, the Zeliox can be switched on and off. The button contains a LED that can display various statuses* of the Zeliox Compact.
An optional dashboard connector has the same function one to one.

* LED statuses:

- Constantly on: the Zeliox Compact is on.
- Constant flashing: The Zeliox Compact charges via the mains. It is a warning to the end user that the Zeliox is connected to the mains and that driving away is not possible. If necessary, the Zeliox Compact can be connected to the start interrupter of the vehicle. Ask for the possibilities at your supplier.
- The LED lights up briefly every 30 seconds: the Zeliox is in power down mode and needs to be charged.

1.1.2 TFT control panel

The Zeliox Compact can be fully operated via the TFT control panel. The control panel is a resistive touch screen for better robustness.

1.1.3 USB type A

No data exchange takes place over this output, only a voltage of 5V is offered. The maximum current that the Zeliox Compact can deliver is 2A distributed between the two connectors.
Type Connector: USB type A.

1.1.4 230V outlet

This standard socket (Schuko) allows you to connect your electrical devices.
Use a extension cord if multiple devices need to be used at the same time. Make sure that the total power does not exceed the Zeliox Compact specification.
Do not use a extension cord connected to the Zeliox Compact outside the harness (vehicle/vessel) if the Zeliox is not connected to the mains.
The voltage on this connector is around 230V/50Hz and is purely sinusoidal, which results in less electromagnetic radiation.
The maximum output power is 1600W.

1.1.5 Light sensor

The light sensor is located at the front next to the USB, it is used for ambient dimming.

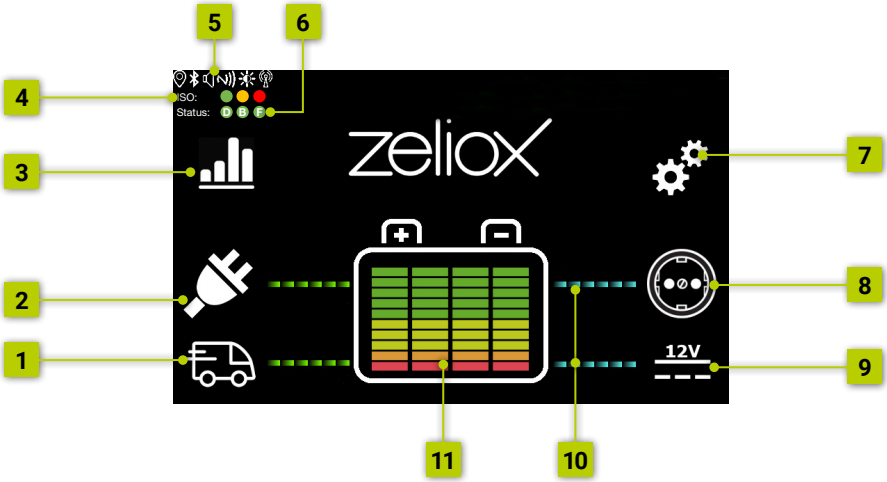
1.1.6 Fan air

Do not block or cover the intake or outlet.

2. Main menu

Using the various icons, the Zeliox Compact can be operated and the statuses can be viewed.

2.1 Status information on the main menu



2.1.1 The following statuses are displayed on the main menu:

1. Vehicle charging status – Indicates whether the Zeliox is charging via the vehicle.
2. 230V in status – Indicates whether Zeliox Compact is connected to shore power.
3. Status information – Displays the various voltages in the Zeliox Compact.
4. Isolation monitor status – Indicates the status of the isolation monitor.
5. Zeliox settings statuses – Indicates which settings are active.
6. Various operational statuses.
7. Settings menu – Only accessible by the experts of Zeliox® (installation manual).
8. 230V out-Indicates whether the 230V output is active (operable).
9. 12V out-Indicates whether the 12V output is active (operable).
10. Current indication–Indicates whether there is power running to the various outputs.
11. Main battery status – Displays the current capacity of the main battery.

2.1.2 Control options from main menu

The following can be operated via the main menu:

- 230V output
- 12V output
- Status page
- Settings menu

2.1.3 Various Operational statuses

This trio of spheres displays the following statuses:

Ⓓ – Lights up green when DC/DC converter (vehicle charging) is active
Ⓑ – Lights up green when backup battery is charging
Ⓕ – Lights up green if Main battery is full

2.1.4 Isolation guard status

These three colored spheres display the status of the insulator watchman:

🟢 – Green: 230V in available
🟡 – Yellow: Isolation monitor active
🔴 – Red: Isolation error detected

3. Engine run signal

3.1 Setting engine running signal

3.1.1 Introduction

The engine running signal is used by the Zeliox Compact to detect whether the alternator produces voltage. If this signal is not adjusted properly, there is a chance that the Zeliox Compact will not be charged or that the battery of the vehicle will be drained by the Zeliox Compact.
The engine running signal of the Zeliox Compact can be set via the main screen of the Zeliox Compact (software-wise), this in contrast to the D + boxes which must be adjusted with a set potentiometer.

3.1.2 Required materials

The following materials are needed to set the engine running signal:

- Vehicle
- (Digital) Voltmeter
- Pin code

3.1.3 Procedure

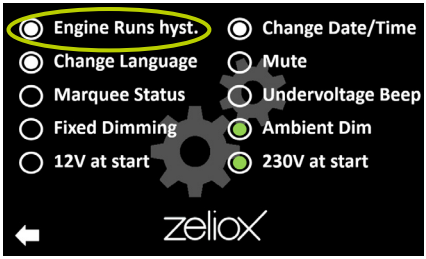
Follow the following procedure:

1. Measure the voltage on the battery when the engine is idling, note this value as V battery.
2. Measure the voltage on the battery with idling motor, note this value as V idle.
3. Start the Zeliox Compact.

4. Go to the settings menu:

Note:
A PIN code is required for this menu.

5. Enter the PIN code (0000).



6. Press the option: Engine Runs hyst.

7. First, the upper voltage limit is requested, this is the value at which the Zeliox Compact begins to charge. The value to be entered is V idle - 0.2. For example, V idle = 14.4V then the value to be entered is 144 (period is added automatically). Type the value and exit with enter.

8. Then the lower voltage limit is requested, this is the value at which the Zeliox Compact stops charging again. The value to be entered is V battery + 0.5. For example if V battery = 12.7V then the value to be entered is 127 (period is added automatically). Enter the value and exit with enter. The lower limit MUST be lower than the upper limit, if not, the procedure starts again.

9. Now press the arrow to the left twice (bottom left), The Zeliox Compact now asks if the changes should be rejected (discard changes), press NO.

10. Changes are now saved and the engine running function can be tested.

4. Settings Menu

4.1 Display settings

A number of Zeliox Compact settings can be adjusted via this menu.
The settings menu contains the following options:

4.1.1 Code
To change the settings enter the code 0000

4.1.2 Display fixed dimming
If the touch screen is not touched, the display will dim slowly. When the display is touched, it will light up at full strength. This reduces the own power consumption of the Zeliox Compact.

4.1.3 Display ambient dimming
The backlight adapts to the ambient brightness, the power consumption can be higher in this mode compared to fixed dimming.

4.1.4 Set time and date
The Zeliox is set at the right time from the factory. The date has the following format: DD/MM/20YY

4.1.5 Mute
The buzzer of the Zeliox Compact can be switched off via settings. The Zeliox Compact will only generate sound in case of errors. If mute is set, the backlight of the display will flash briefly when the screen is touched. In this way, this way you get feedback when touching the touchscreen.

4.1.6 Undervoltage beep
When the Zeliox Compact is in undervoltage, a beep will be generated in addition to a flashing LED (of by default).

4.1.7 Language setting
You can set the language of the Zeliox Compact. The language is displayed at the top right.
- Dutch (NL)
- English (EN)
- German (DE)
- French (FR)

4.1.8 12V at start

The 12V output is active when this option is set (off by default).

4.1.9 230V at start

The 230V output is active when this option is set (on by default).

4.1.10 Marquee status

With this setting the marquee can be switched on/of, in the area above the Zeliox logo, additional information can be shown:

- Fan 1 and 2 speed
- Battery temperature
- Battery voltage
- Auxiliary voltage
- Air pressure

5. Operating conditions

5.1 Operating the Zeliox Compact

5.1.1 Introduction

This chapter describes the various Zeliox Compact modes and how to get into these modes.

5.1.2 Zeliox off

In this mode, the Zeliox is completely off:

- Led in power switch off
- Display off
- No voltages on the outlets

In this position the main battery is continuously monitored to detect undervoltage. Undervoltage will eventually damage batteries beyond repair. In case of damage, they will have to be replaced by a Zeliox expert.

5.1.3 Zeliox Compact operating condition “on”

In this state the Zeliox Compact is not connected to the mains, and the 230V inverter is switched on. 230V will be applied to both front (schuko socket) and the back (fixed connection for users). This output is immediately available, but can be switched via the 230V-out icon on the touch screen.

- USB 5V/2A is not switchable and always available, unless the Zeliox Compact is switched off.
- The 12V output is available and can be turned on via the 12V icon on the touch screen.
- The white LED in the on/off switch lights up constantly as an indication that the Zeliox Compact is on.

5.1.4 Enable “on” operating state

The Zeliox Compact can be switched on by the on/off switch. There are more ways to turn the Zeliox Compact on: via the mains or incoming power via 12V. For more information, see the following chapters.

5.1.5 Operating status “interactive charging via shore power”

In this state, the Zeliox Compact is connected to the mains and the charger will be active. 230V will be applied to both front (schuko socket) and the back (fixed connection for users). This output is immediately available, but can be switched via the 230V-out icon on the touch screen.

- USB 5V/2A is not switchable and always available, unless the Zeliox Compact is switched off.
- The 12V output is available and can be turned on via the 12V icon on the touch screen.
- The white LED in the on/off switch will start flashing to indicate that charging is active.

5.1.6 Operating condition “automatic charging via shore power”

This mode can be used when the Zeliox Compact is connected to a timer. This also prevents the inverter from being left on unnecessarily when the voltage drops.

The following voltages appear directly on the respective outputs:

- 230V at the front and rear
- 5V front USB

On the display, the 230V-in icon will light up and the LED in the switch will flash. The 12V output does not turn on automatically and must be switched manually via the main menu.

5.1.7 Operating status “Autonomous charging via shore power” switch on and off (long term storage)

Before the Zeliox Compact can be put away in this mode, it must first be started. Connect the Zeliox Compact to the shore power, this will now start to charge. Press the on/off switch, a warning will be shown that the Zeliox Compact is charging. Press the on/off switch again and the Zeliox Compact will turn off.

The Zeliox Compact will now turn on when the battery comes into undervoltage and will charge. After the batteries are fully charged, the Zeliox Compact will automatically switch off again.

6. 12V charger

6.1 Installations with a 12V charger

6.1.1 Operating status “on, with recharging from alternator”

The Zeliox Compact connected to the alternator in this state and it is charging. The “vehicle “charger of the Zeliox Compact is now active.

Because the Zeliox Compact is switched on via the on/off switch, the 230V inverter will be active. 230V will be applied to both front (Schuko socket) and the back (fixed connection for users). This output is immediately available, but can be switched via the 230V-out icon on the touch screen.

USB 5V/2A is not switchable and always available, unless the Zeliox Compact is switched off.

The 12V output is available and can be turned on via the 12V off icon on the touch screen.The white LED in the on/off switch will start flashing to indicate that charging is active.

6.1.2 Operating status “on, with charging from alternator” switch on and off

First switch on the Zeliox Compact via on/off switch, then start the engine, the Zeliox Compact is now recharged and the outputs are available. Turn off the engine to stop the top-up. Use the on/off switch to turn off the system.

6.1.3 Operating status “autonomous charging alternator”

Charge while driving. The Zeliox Compact will automatically start up as soon as the alternator starts charging. During this mode it is not possible to operate the touchscreen, only a status is visible. USB 5V output is still available in this mode.

6.1.4 Operating status “autonomous charging alternator” switch on and off

The Zeliox Compact must be off. As soon as the alternator starts charging, the Zeliox Compact will wake up and start charging. The Zeliox Compact will go out again as soon as the alternator stops charging.

7.1 Battery Mode

7.1.1 Introduction

The main battery of the Zeliox has a voltage range of 10 to 14.4 Volts. This voltage determines in which condition the Zeliox Compact operates. The following operating conditions are:

- Discharge mode
- Battery protection mode
- Power safety mode
- Charging mode

7.1.2 Discharge mode

In this mode, the Zeliox Compact is not charged via shore power or vehicle charging and the required energy is extracted from the internal main battery. The following conditions determine how long the end user can use this mode:

- Charge level of the internal main battery
- Load capacity connected to the Zeliox Compact
- To a lesser extent the ambient temperature of the Zeliox Compact
- The age of the Internal main battery

The voltage of the internal battery in this mode is between 10.2 and 14.4 volt, when reaching a voltage of 10.2 volts, the Zeliox Compact will switch to battery protection mode.

7.1.3 Battery Protection Mode

Do not fully discharge the internal battery, this is not good for the service life. To extend the life of the main battery, the voltages on the outputs are switched off (except for the USB output as it is limited to max 1A). The voltages on the outputs come back when the main battery reaches a voltage of 12V or when the Zeliox Compact is connected to the mains. In this mode, the Zeliox Compact will indicate on the display that the main battery needs to be charged.

Since the Zeliox Compact itself also uses energy, the main battery voltage will slowly decrease further to a level of 9.8V. When this voltage is reached, the Zeliox Compact will switch to Power safety mode to further protect the main battery.

7.1.4 Power safety mode

The power safety mode starts when the main battery reaches a voltage below 9.8 volts. The Zeliox Compact will go completely off.
The Zeliox Compact control unit will operate entirely on a back-up battery. Power consumption is minimized and the Zeliox Compact will give a warning for about 7 days via the LED in the on/off switch. This LED will then light up briefly every 30 seconds.

The Zeliox Compact can be restarted by the following actions:
- Connecting to the mains
- Turn on contact (vehicle/vessel)

The main battery will be recharged after the Zeliox Compact is connected to the mains or the contact is turned on. The Zeliox Compact will switch off again after 10 seconds if the ignition is turned on, but the alternator does not charge.

If the backup battery runs out, please contact Zeliox.

7.1.5 Charging mode

The Zeliox Compact is connected to the mains or charged by the alternator. Charging will remain active until the battery has reached a voltage of 14.4 Volts. The charger places a higher voltage on the main battery due to the alternator. The battery level indicator will not indicate the nominal voltage of the main battery but will be based on the charging voltage.

7.2 Battery behaviour

7.2.1 Introduction

This chapter describes the behaviour of a LiFePO4 battery that is of interest to the end user.

7.2.2 Battery characteristics

The main battery in the Zeliox Compact is of the type LiFePO4. This lightweight battery has some good features such as high energy density.
A theoretical ideal voltage source has a number of characteristics:
- Constant voltage
- Internal resistance of 0 ohms
- Unlimited power
- Temperature independent

7.2.3 Lithium battery

A Lithium battery is unfortunately not ideal, the end user will have to take this into account.
The internal resistance of a Lithium battery is sub milli (one thousandth) ohm. At high currents, the voltage of the battery will therefore drop. After removing a high current, the voltage of the battery will recover. The cables to which the battery is connected also give a loss.

7.2.4 Voltage

The voltage that the battery delivers depends on the current charge. If the charge of the battery decreases due to consumption, the voltage of the battery will also decrease.

7.2.5 Chemical process

A chemical process takes place in the battery in which charge moves. The mobility of this charge determines the amount of energy that can be delivered over a certain period of time.
It is therefore possible that at high load, the battery cannot supply the requested energy. This does not mean that the battery is empty, but it will recover afterwards.

7.2.6 Battery protection

The ambient temperature affects the behaviour of the battery. A Lithium battery should not be charged below 5°C to prevent damage to the battery. The charging circuit of the Zeliox Compact is therefore switched off below 5°C and the discharge of the battery is switched off at 0°C. (a winter package is optionally available).
The end user should be aware of the battery limitations above as they reflect the behaviour of the Zeliox Compact.

7.2.7 Battery behaviour

It is possible that the stresses of the individual cells differ when the main battery comes in undervoltage. This is normal behaviour and not a cause for concern. The age and use of the battery also influences the behaviour. Due to a number of protective measures in the Zeliox Compact, the life of the battery will be extended.
This does not mean that the battery has an infinite lifespan and therefore eventually needs to be replaced.

8. Sensors

8.1 Explanation of sensors

8.1.1 Temperature sensors

The Zeliox Compact contains several temperature sensors placed in internal crucial places:

- Mainboard sensor – This sensor measures the temperature of the CPU board. If the temperature is too high, the Zeliox Compact switches off.
- CPU sensor- This on-chip sensor measures the temperature of the CPU chip. If the temperature is too high, the Zeliox Compact switches off.
- Main battery temperature sensors (2x) – These sensors measure the temperature of the main battery. If the temperature is too high, the charging process will stop to prevent damage (55°C), the charging process will also stop at a temperature below 5°C. At 0°C, the discharge of the main battery also stops.
- Fan controller sensor – this sensor is connected, but is used passively.

8.1.2 Humidity sensor

This humidity sensor measures the humidity in the Zeliox Compact. The CPU calculates the dew point based on the temperature. The Zeliox Compact switches off when the dew point temperature is reached to prevent damage to the electronics.

8.1.3 Pressure sensor

This sensor estimates the current height at which the Zeliox Comact is located. The Zeliox Compact turns off if the air pressure is too low, as it may be unsafe to charge the battery.

8.1.4 Accelerometer and magnetometer (6-axes)

The accelerometer keeps track of whether the Zeliox Compact has been involved in a high-energetic collision. In that case, integrity and therefore safety of the Zeliox Compact can no longer be guaranteed, so the Zeliox Compact will shut down completely and it needs to be checked by the experts of Zeliox®. It is not allowed to turn the Zeliox Compact upside down or on its back. This sensor also checks whether this situation has occurred.

8.1.5 Case open sensor

It is not allowed to open the Zeliox Compact by unauthorized personnel, the Zeliox Compact contains dangerously high voltages. This sensor checks whether the housing of the Zeliox has been opened. If the Zeliox is opened, the Zeliox Compact will no longer function and has to be reset at a cost by the experts of Zeliox®.

9.1 End-user protective devices

9.1.1 Earth leakage switch

The switch protects the user from unsafe situations related to the 230V output.
It prevents the end user from being exposed to 230V, which can be deadly. If there is a unwanted current leaking through the user's body, the earth leakage switch will interrupt the current.

9.1.2 Situation in an isolated environment (in a vehicle)

A standard earth leakage circuit breaker does not work in an isolated environment in case of an insulation error. To prevent the shortcomings of an earth leakage circuit breaker in this situation, an insulation monitor has been installed in the Zeliox Compact.

9.1.3 Isolation monitor

In some cases, the earth leak switch cannot function, for example in the field when the Zeliox Compact is not connected to the mains and the end user is in the harness (vehicle/vessel). In that case, an isolation monitor is required. The Zeliox Compact contains an insulation monitor and is only active when the Zeliox Compact is not connected to the mains.

9.1.4 Fuses

The Zeliox Compact contains a number of fuses to prevent short circuits and/or fires. If a fuse has melted, the Zeliox Compact will have to be checked for damage. The fuses may only be replaced by the experts of Zeliox®.

10. Safety

10.1 Safety of the zeliox compact

10.1.1 Summary

The Zeliox Compact is equipped with various sensors to make the operation of the Zeliox Compact as safe as possible. However, the end user must use the device within the specifications and applicable safety standards.

11. Trouble shooting

11.1 Zeliox App

Download the Zeliox App
www.zeliox.com

Apple Store
iOS

Google Play
Android

Installation Manual

Zeliox Compact

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1. Installation

Read the Warnings before installing the Zeliox Compact pag. No. 4/5

1.1 Installation Zeliox Compact

When installing, national security regulations must be strictly followed, in accordance with the application requirements for housing, installation, spacing, clearance, markings and separation.
The installation must be carried out by professional installers only.

Check the site www.zeliox.com for the installation instructions for various systems such as: Aluca, Bott, Sortimo, etc..

1.2 Main menu

1.2.1 Various icons

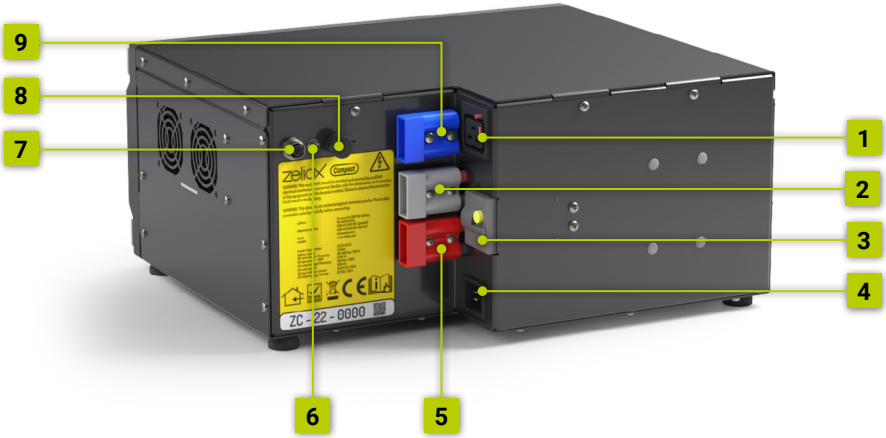
With the help of the various icons, the Zeliox Compact can be operated and the statuses can be viewed.

1.2.2 Zeliox Compact menu screens

This chapter describes the different menu screens. The settings menu is pin protected and may only be used by the experts of Zeliox®.

2. Rear connections

2.1 Connections



Standard connections:

1. 230V out
2. 12V out
3. Earth leakage switch
4. 230V in
5. 12V in
6. GPS antenna in (optional)
7. Connector for remote control
8. USB data
9. Solar power in (optional)

2.1.1 230V out connector

A 230V out connector. This connector can be used in (for example) vehicles where a fixed 230V installation has been placed. The connector has a lock to prevent the cable from accidentally unplugging.
The voltage on this connector is around 230V/50Hz and is purely sinusoidal, resulting in less electromagnetic radiation. The maximum output power is 1600W.
Connector type: IEC C20, a cable is not included in the standard delivery program and must be ordered separately.

2.1.2 12V out connector

The 12V output can be switched by the control screen. When switched on, the output voltage will be equal to the internal battery voltage, so it is between 10.2 and 14.4 volts. The 12V output is secured with a fuse of 25A. Connector type: Anderson SB50 grey.

2.1.3 Earth leakage switch

The device protects the user from unsafe situations related to the 230V output.

2.1.4 230V in connector

This connects the Zeliox Compact to the mains. The input voltage may be between 220 and 240V with a frequency of 50Hz. The built-in charging protocol of the Zeliox charges the internal battery according to the charging specification of LifePO4 batteries.
Connector type: IEC C19, a charging cable is included as standard.

2.1.5 12V in connector

The Zeliox Compact can be connected to a vehicle by this connector. The input voltage is between 10 and 15V. A built-in charging program charges the internal battery.
Connector type: Anderson SB50 red.

2.1.6 GPS antenna in (optional)

A GPS tracking system is optional in the Zeliox Compact. If built-in, the GPS antenna can be connected to this connector.
Connector type: SMA.

2.1.7 USB Data

This USB is to upload new firmware.

2.1.8 Connector for remote control (optional)

This connector can optionally be connected to a dashboard switch, the contact-on signal and the immobilizer.

This connector contains the following signals:
- LED +/-
- Switch 1/2
- Contact to signal
- Shore indication (start breaker)

The optional package contains the following components:
- Switch
- Cable (option 5 or 10 meters)
- Switch socket

Use the wiring diagram below to connect the cable to the dashboard switch:

Figure 1 wiring diagram dashboard cable

Leave wires 6 to 8 unconnected (dangling) and isolated.

Left **Cable to Zeliox Compact**
1. White
2. Brown
3. Green
4. Yellow
5. Grey
6. Pink (optional)
7. Blue (optional)
8. Red (optional)

Right **Blue connector**
1. Red
2. Green
3. Blue
4. Yellow
5. Black

2.1.9 Solar Power in (optional)

A solar panel can be connected to the Zeliox Compact via this connector. This connection is optional and the entire Solar installation will be offered by the dealer.
Connector type: Anderson SB50 blue.

3.1 Setting engine running signal

3.1.1 Introduction

The engine running signal is used by the Zeliox Compact to detect whether the alternator produces voltage. If this signal is not adjusted properly, there is a chance that the Zeliox Compact will not be charged or that the battery of the vehicle will be drained by the Zeliox Compact.
The engine running signal of the Zeliox Compact can be set via the main screen of the Zeliox Compact (software-wise), this in contrast to the D + boxes which must be adjusted with a set potentiometer.

3.1.2 Required materials

The following materials are needed to set the engine running signal:

- Vehicle
- (Digital) Voltmeter
- Pin code

3.1.3 Procedure

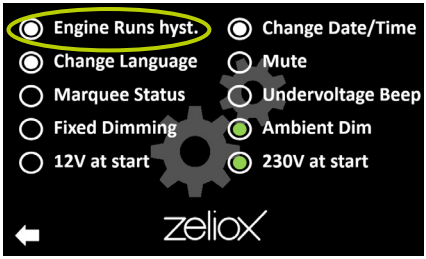
Follow the following procedure:

1. Measure the voltage on the battery when the engine is idling, note this value as V battery.
2. Measure the voltage on the battery with idling motor, note this value as V idle.
3. Start the Zeliox Compact.

4. Go to the settings menu:

Note:
A PIN code is required for this menu.

5. Enter the PIN code (0000).



6. Press the option: Engine Runs hyst.

7. First, the upper voltage limit is requested, this is the value at which the Zeliox Compact begins to charge. The value to be entered is V idle - 0.2. For example, V idle = 14.4V then the value to be entered is 144 (period is added automatically). Type the value and exit with enter.

8. Then the lower voltage limit is requested, this is the value at which the Zeliox Compact stops charging again. The value to be entered is V battery + 0.5. For example if V battery = 12.7V then the value to be entered is 127 (period is added automatically). Enter the value and exit with enter. The lower limit MUST be lower than the upper limit, if not, the procedure starts again.

9. Now press the arrow to the left twice (bottom left), The Zeliox Compact now asks if the changes should be rejected (discard changes), press NO.

10. Changes are now saved and the engine running function can be tested.

4. APPENDIX II - MSDS - (Material Safety Data Sheet)

The Zeliox has several self-preserving functions built in.
Some of these are made visible through the screen.
An app will be available for easy troubleshooting (for iOS and Android).

SECTION 1. INDENTIFICATION

Product identifier	Zeliox • lithium-ion battery powered Sinewave inverter .
Product Identification Number	Unique serial number on side, format ZC-XX-XXXX (for example , “ZC-20-0001”)
Other means of identification	DC to AC Sinewave inverter Lithium-ion battery.
Recommended use	This lithium-ion battery powered inverter can be used everywhere.
Restrictions on use	Do not overheat, do not use under water, do not short-circuit.
Initial supplier identifier	Zeliox HQ Spaarpot 13, 5667 KV Geldrop www.zeliox.com
Emergency telephone number	+31 40 3400 383

SECTION 2. HAZARD IDENTIFICATION

Classification	Class 9
Hazard	It causes heat generation or electrolyte leakage if battery terminals contact with other metals. Electrolyte is flammable. In case of electrolyte leakage, move the battery from fire immediately.
UN Number	UN3481

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Zeliox 1,20 kWh:

Chemical Name	**CAS no.**	**Common name / Synonyms**
LiFeP04	-	Lithium Iron Phosphate

Chemical Element	**Chemical Index**	**CAS no.**	**EC no.**
LiFePO4	26,61%	15365·14-7	604-917·2
Electrolyte	20,83%	-	-
Graphite	14,32%	7782-42-5	231-955-3
Aluminium	10,90%	7429-90-5	231-072-3
Copper Foil	8,80%	7440-50-ll	231-159-6
Battery Cover	8,39%	-	-
Aluminium Foil	4,71%	7429·90-5	231·072·3
Diaphragm	3,00%	9003-07-0	618-352·4

SECTION 4. FIRST-AID MEASURES

The product contains organic electrolyte. In case of electrolyte leakage from the battery, actions described below are required.

Inhalation
Remove to fresh air immediately. Take to a medical treatment.

Skin contact
Wash the contact areas off Immediately with plenty of water and soap. If appropriate procedures are not taken it can cause sores on the skin.

Eye contact
Flush the eyes with plenty of clean water for at least 15 minutes immediately, without rubbing. Take a medical treatment. If appropriate procedures are not taken it can cause an eye irritation.

Special risks

R22	Harmful if swallowed
R43	May cause sensitisation by skin contact

Safety advice

S2	Keep out of the reach of children
S22	Do not breathe dust
S24	Avoid contact with skin
S26	In case of contact with eyes, rinse immediately with plenty of water and seek medical advice
S36	Wear suitable protective clothing
S37	Wear suitable gloves
S43	In case of fire use water, type D or CO_2
S45	In case of accident or if you feel unwell seek medical advice immediately

SECTION 5. FIRE-FIGHTING MEASURES

Extinguishing Media

Suitable Extinguishing Media	> immersed in water I cooled I ventilate, Type D fire extinguisher, CO_2
Unsuitable Extinguishing Media	> Foam extinguishers, hose

Specific Hazards Arising from the Product
Following cell overheating due to external source or due to improper use, electrolyte leakage or battery container rupture may occur and release inner component/material to the environment.

Eye contact: the electrolyte solution contained in the battery is irritant to ocular tissues.

Skin contact: the electrolyte solution contained in the battery causes skin irritation.

Ingestion: the ingestion of electrolyte solution causes tissue damage to throat and gastro/respiratory tract.

Inhalation: contents of a leaking or ruptured battery can cause respiratory tract, mucus, membrane irritation and oedema.

Special protective equipment and precautions for firefighters
Use self-contained breathing apparatus to avoid breathing irritant fumes and wear protective clothing and equipment to prevent body contact with electrolyte solution.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal Precaution, Protective Equipment and Emergency Procedures
Remove personnel from area until fumes are gone. If the skin has come into contact with electrolyte, it should be washed thoroughly with plenty of water.

Methods for Containment and Cleaning up
The material contained within the batteries would only be expelled under abusive conditions. Using shovel or broom, cover battery or spilled substances with dry sand or vermiculite, place in approved container (after cooling if necessary) and dispose accordance with local regulations.

SECTION 7. HANDLING AND STORAGE

Precautions for Safe Handling
Do not crush, pierce, short circuit.
Do not directly heat or solder.
Do not throw into fire.
Do not mix batteries of different types and brands.
Do not mix new and used batteries.
Keep batteries in original housing.
The Zeliox must be fully charged before storing it for a longer period of time.
Check every 100 days and fully recharge.

Conditions for Safe Storage
Store in a cool (preferably between 10-30°C) and ventilated area, away from moisture, sources of heat, open flames, food and drinks.
Keep adequate clearance between walls and batteries.
Temperatures above 70°C may result in battery leakage and rupture.
Since a short circuit can cause burns, leakage and rupture hazard, keep batteries in original housing and do not take the housing apart and/or disassemble.

SECTION 8. EXPOSURE CONTROL/ PERSONAL PROTECTION

Control Parameters	X
Notes	X
Appropriate Engineering Controls	X

Individual Protection Measures:
Eye/Face Protection
Not necessary under normal use. Wear safety goggles or glasses with side shields if handling a leaking or ruptured battery.

Skin Protection
Not necessary under normal use. Use rubber protective gloves if handling a leaking or ruptured battery.

Respiratory Protection
Not necessary under normal use. In case of battery rupture, use self-contained full-face respiratory equipment.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Rectangular shaped dark grey steel casing with plastic front.
Specific Energy	1,20 kWh
Voltage	Input 12V / output 5V, 12V, 230V
Current Limit	At 5V 2A / at 12V 20A / at 230V 16A
Weight	23 Kg EU (1600W/1,20kWh) 22 Kg EV (1600W/1,20kWh)

SECTION 10. STABILITY AND REACTIVITY

Reactivity	Not applicable
Chemical Stability	Product is stable under conditions described in Section 7
Possibility of Hazardous Reactions	Short circuit followed by Inflammation
Conditions to Avoid	Heat above 70 °C or incinerate Deform Mutilate Crush Pierce Disassemble Short circuit Expose over a long period of time to humid conditions

SECTION 11. TOXICOLOGICAL INFORMATION

Likely Routes of Exposure
Inhalation_ Skin contact_ Eye contact_ Ingestion

Acute Toxicity	LC50	X
	LD50 (oral)	X
	LD50 (dermal)	X

Skin Corrosion / Irritation
The electrolyte solution contained in the battery causes skin irritation.

Serious Eye damage / Irritation
The electrolyte solution contained In the battery is irritant to ocular tissues.

STOT (Specific Target Organ Toxicity) - Single Exposure
The Ingestion of electrolyte solution causes tissue damage to throat and gastro/ respiratory tract. Contents of a leaking or ruptured battery can cause respiratory tract, mucus, membrane Irritation and oedema.

SECTION 12. TRANSPORT INFORMATION

Regulation	-
UN No.	3481
Proper Shipping Name	rare earth lithium rechargeable battery
Technical Name (for N.O.S. entry)	-
Transport Hazard Class(es}	9
Packing Group	II

Special Precautions

Please note
Risk of fire.
Explosion and burns.
Do not short-circuit, crush, incinerate or disassemble the Zeliox Compact.

Environmental Hazards	Not applicable.
Transport in Bulk Acc. To Annex II of MARPOL 73/78 and the IBC Code.	Not applicable.

SECTION 13. ECOLOGICAL INFORMATION

When properly used or disposed, the Lithium-Ion batteries do not present environmental hazard.

SECTION 14. DISPOSAL CONSIDERATIONS

Disposal Methods
Dispose In accordance with applicable regulations which vary from country to country. (In most countries, the trashing of used batteries is forbidden and the end-users are invited to dispose them properly, eventually through not-for-profit organizations, mandated by local governments or organized on a voluntary basis by professionals}.
Lithium-Ion batteries should have their terminals insulated and be wrapped In plastic bags prior to disposal.

NON SPILLABLE
LI-ION BATTERY

5. Glossary and abbreviations

Battery	- A battery stores electricity for future use.
CPU	- Central Processing Unit. This is the computing heart of the Zeliox Compact.
Dew point	- The dew point indicates at what temperature the moisture in the air begins to condense. Depends on temperature and humidity.
DC/DC	- Converts DC voltage to another DC voltage.
LED	- Light Emitting Diode, a light-emitting diode, is used as an indicator.
LiFePO4	- Lithium iron phosphate battery.
GPS	- Global Positioning System; satellite navigation.
IEC	- International Electrotechnical Commission; an international standardization committee.
Resistive	- Touch screen technology. Unlike capacitive, resistive needs more pressure to register a touch, but is less sensitive to interference.
Schuko	- Short for Schutzkontakt, 230V plug type in the Netherlands and Germany.
SMA	- Sub Miniature version A; High frequency connector type.
Voltage lock	- Junction box for device plugs.
TFT	- Thin Film Transistor.
USB	- Universal Serial Bus.
Shore power	- Terminology from shipping. The Zeliox Compact is connected to the mains.

6. Technical Information

Name	Zeliox Compact
Description	1600W / 1,2 kWh
Model no.	ZEL16-1,2-EU
Battery type	Lithium 12V - 100Ah
Battery chemistry	LiFePO4
Battery capacity	100Ah
Available capacity	90%
Charge / discharge cycles	4000 times (at 80%)
AC input voltage	185 - 270V
AC input frequency	50Hz
AC input power (charge power)	950W
AC output voltage	230V AC
AC output frequency	50Hz
AC output Amp limit (A)	10A
AC output power - continously	1300W
AC output power - 3 minutes	2300W
AC output power - 10 minutes	1600W
AC output power - peak (10 sec)	2500W
Operation time 230V - 250W @ 25°C	4h
Operation time 230V - 500W @ 25°C	2h
Operation time 230V - 1000W @ 25°C	1h
Operation time 230V - 1400W @ 25°C	40m
Operation time 230V - 1600W @ 25°C	30m
Discharge rate - switched off via MKS	n/a
Discharge rate - switched OFF	7mA = 12000 hrs = 500 days (ex self discharche battery)
Discharge rate - switched ON / Stand-by mode	350mA (fans 2500rpm) , display on; 280 hrs = 11,5 days
Maximum efficiency	93%
DC input voltage	12-15V DC
DC input continous current	60A
DC output voltage	12V
DC output Amp limit (A)	25A

Name	Zeliox Compact
DC output power (W)	300W
DC output continuous current	25A
DC output maximum current	35A
DC output max impulse current 20 min	n/a
DC output max impulse current 1 min	n/a
DC output max impulse current 10 sec	n/a
Operating temperature range	0-50°C
Maximum storage temperature	70°C
Cooling	forced air
Connection 230V AC	Zeliox Compact Power Cable
Connection 230V AC	1x Schuko standard type: 1x IEC C19
Connection 12V DC input	Anderson 50A
Connection 12V DC output	Anderson 50A
IP rating	IP20
Product weight	23 kg
Product dimensions	420 x 190 x 355 mm (l x h x d)
Shore power safety system	Auto-detect Shore Power > shore power must have working earth safety
Stand-by mode safety	auto-detect inactivity and auto-wake up
Low battery warning	light and sound warning system for low battery
Protection against	short circuit / overload / AC back feed / high input ripple voltage
Remote data read-out (optional)	Bluetooth
GPS (optional)	read out of Zeliox' position via GPS
Solar Power input (optional)	alternative power input for the Zeliox
Initial Supplier Identifier	Zeliox
Address	Spaarpot 13, 5667 KV, Geldrop
General telephone number	0031 40 3400 383 only during office hours 08:00-16:45
Service telephone number	0031 40 3400 384 only during office hours 08:00-16:45
Version	V 2.0.4
Version date	18/10/2021

7. Error Zeliox Compact

7.1 Error messages

7.1.1 3V3 voltage domain error

Full message:	3V3 error / Shutting down (red)
Means:	The 3.3V voltage domain is not available.
Action:	Zeliox Shuts down

7.1.2 5V voltage domain error

Full message:	5V error / No Sound (orange)
Means:	The 5V voltage domain and thus sound is not available.
Action:	Error message and continue

7.1.3 12V voltage domain error

Full message:	12V error / Contact Zeliox (orange)
Means:	The 12V voltage domain is not available.
Action:	Error message and continue

7.1.4 Voltage reference error

Full message:	VREF error / Contact Zeliox (orange)
Means:	The 12V voltage domain is not available.
Action:	Error message and continue

7.1.5 FAN error

Full message:	FAN error / Contact Zeliox (white)
Means:	One or more FANs do not run
Action:	Error message and continue. When active the Zeliox can overheat faster.

7.1.6 Backup battery error

Full message:	VBAT error / Contact Zeliox (orange)
Means:	The backup battery voltage level is low.
Action:	Error message and continue

7.1.7 Low main battery voltage

Full message:	Low voltage / Please Charge (orange)
Means:	The main battery voltage has reached the lower threshold and need to be charged.
Action:	Error message and Zeliox will continue

7.1.8 Over voltage main battery

Full message:	Low voltage / Please Charge (orange)
Means:	An over voltage has been measured on the main battery. Contact Zeliox.
Action:	Error message and activities are stopped

7.1.9 Cell anomaly

Full message:	Cell Anomaly / Contact Zeliox (orange)
Means:	One or more of the cells is used out of specs. Contact Zeliox
Action:	Error message and Zeliox will continue

7.1.10 Low main battery voltage but charger active

Full message:	Low voltage / Charger Active (white)
Means:	The main battery voltage has reached the lower threshold, but charger is active. Message will disappear as soon the threshold is reached.
Action:	Error message and Zeliox will continue

7.1.11 Battery protection Mode

Full message:	Bat. Protection on / Inverter/12V Off (orange)
Means:	This is the latest message the user will get before the Zeliox will switch off
Action:	Error message. Zeliox will switch off all outlets and continue displaying this error until it switches completely off

7.1.12 No BMS active or present

Full message:	No BMS / Using analog (white)
Means:	The Battery management System is not active
Action:	Warning message. Zeliox will switch over to a redundant analog but less advanced system. No charging possible! Contact Zeliox ASAP.

7.1.13 Isolation fault occurred

Full message:	ISO FAULT. Please / restart (orange)
Means:	An isolation fault occurred
Action:	Error message and activities are stopped (no output and input), user needs to switch off and on the Zeliox to de-assert the isolation fault

7.1.14 No Isolation guard active

Full message:	No ISO, please / Contact Zeliox (orange)
Means:	No isolation guard active. Contact Zeliox ASAP
Action:	Error message and activities are stopped (no output and input)

7.1.15 No DC/DC converter active

Full message:	NO DC/DC / Converter (orange)
Means:	It is not possible to charge the Zeliox via de attenuator
Action:	Error message and activities are stopped (no output and input)

7.1.16 Internal battery is too cold

Full message:	Bat-cold, No power output (orange)
Means:	The internal battery is too cold for operation.
Action:	Error message and activities are stopped (no output and input)

7.1.17 Internal battery is too hot

Full message:	Bat-hot, No power output (orange)
Means:	The internal battery is too hot for operation.
Action:	Error message and activities are stopped (no output and input)

7.1.18 Power limit reached

Full message:	Power limit / reached (1800VA) (orange). Two 2000Hz beeps can be heard.
Means:	The output power exceeded 1800VA.
Action:	Error message and activities are stopped (no output and input). User has to remove load and restart Zeliox

7.1.19 Case open warning

Full message:	Case open / Close case (white). One 1000Hz beep is generated
Means:	The System detected an open case.
Action:	Warning Only

7.1.20 Air pressure warning

Full message:	Air pressure! / Out of spec (white).
Means:	Ambient air pressure is too high.
Action:	Warning Only

7.1.21 Zeliox mainboard temperature too high

Full message:	Mainboard / temp too High (orange). Five 1000Hz beeps can be heard.
Means:	The mainboard temperature sensor detected a too high temperature.
Action:	Error message and activities are stopped (no output and input).

7.1.22 Dew point too low

Full message:	Low Dew Point / Stopped (orange).
Means:	The temperature is below the calculated dewpoint
Action:	Error message and activities are stopped (no output and input).

7.1.23 Vehicle acceleration too high

Full message:	Acceleration / Out of spec (white).
Means:	Vehicle acceleration too high.
Action:	Warning Only

7.1.24 Contact is on message

Full message:	Contact is on. / Touch inhibited (white).
Means:	Car contact is on and therefore the Zeliox Compact can't be operated via the touchscreen.
Action:	Info only

7.1.25 Mains is present while pressing main switch

Full message:	(1) Mains present / Unplug mains / (2) Or Press PWR / Switch again (white).
Means:	The power switch has been pressed while the Zeliox is charging via the mains. The user has to press the power switch again If the user want to switch off the Zeliox Compact while still connected to the mains.
Action:	Warning Only

Notes

Notes

Zeliox BV
Spaarpot 13, 5667 KV, Geldrop
The Netherlands
www.zeliox.com

Zeliox®
EXCESSIVEPOWER