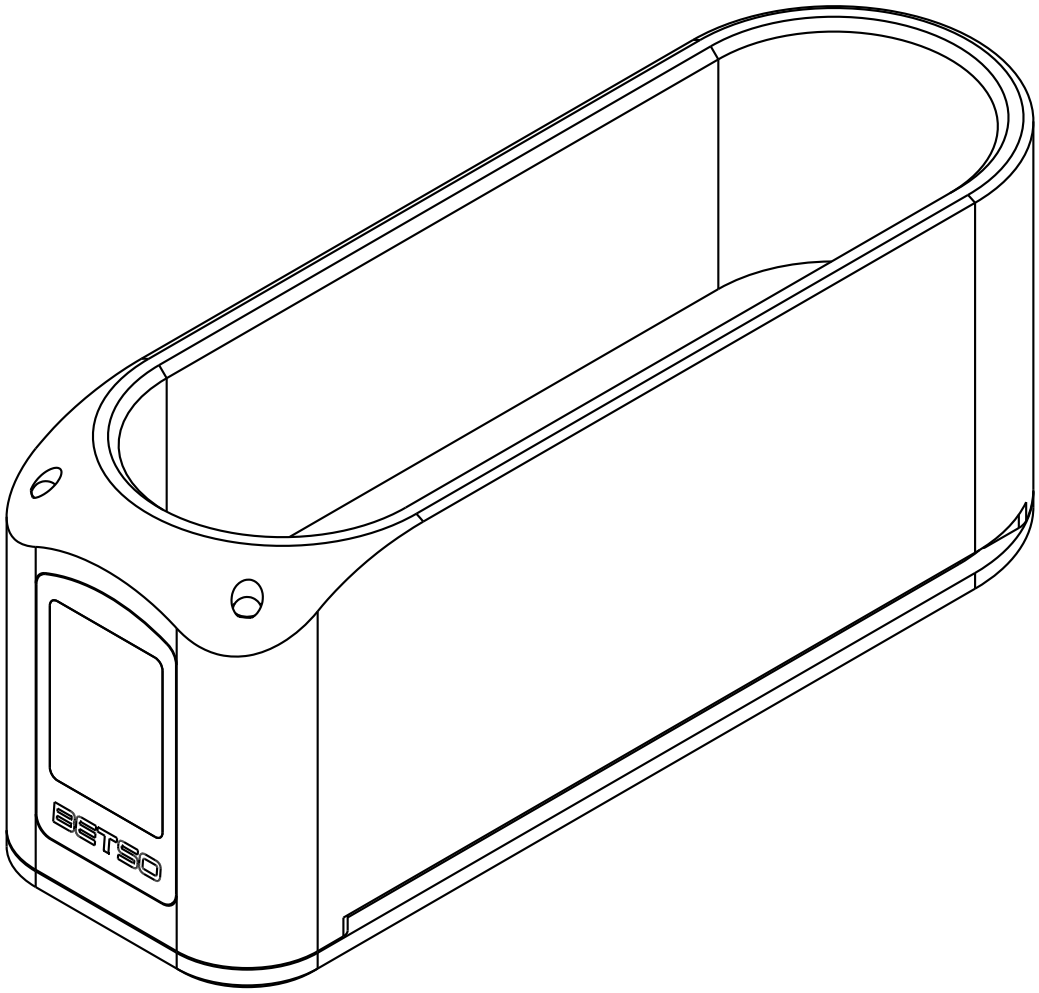
BETSO

SB CHARGER

65W powerful smart battery charger and 100W Type-C PD compatible power source



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Used symbols



Indicates text that is informative. Overlooking this information will not result in product damage.



Indicates important instructions. Ignoring these may lead to product damage.

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Thank you for purchasing a BETSO product!

Please carefully review the following user manual for your new BETSO device. By following these instructions, you will prevent potential damage to your device and ensure that you can fully utilize all its available features.

For the latest updates on BETSO products, please contact your local distributor or visit our website at https://www.betso.eu.

1. Product description

The SB CHARGER is a compact, durable smart battery charger designed for an effortless charging experience. Featuring an OLED display, informative LED indicators, a single-button interface, a convenient USB connector, and a compact size, it's a pleasure to use. The user manual provides detailed instructions on how to operate the charger, as well as the optional charging dock, which accommodates two or four SB CHARGERs for various charging needs.

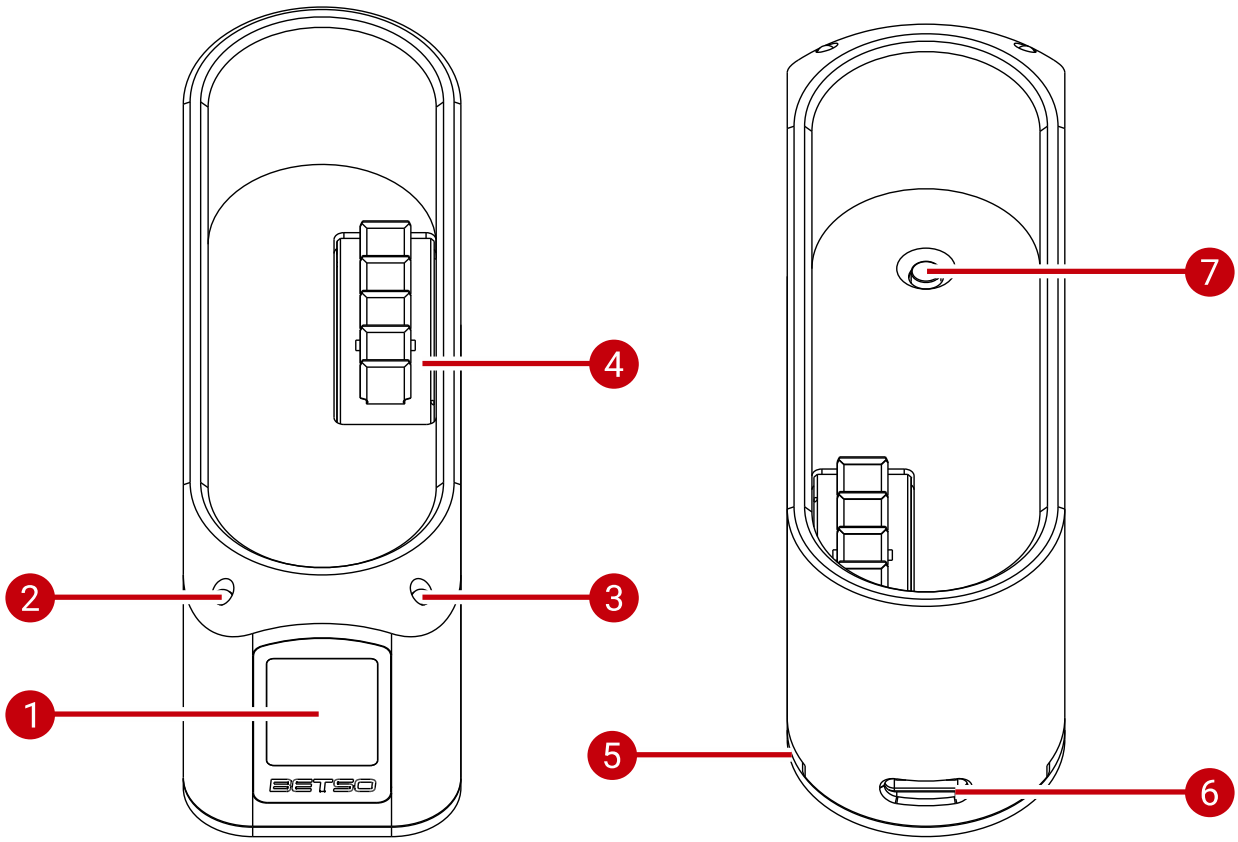
2. Top features

- **Sunlight-readable OLED display** for real-time information on charging status, warnings, charge cycles, power delivery, and more.
- **Two RGB LEDs for quick visual indication** of power supply strength, charging progress, and potential errors.
- **Adjustable charging current** - easily set the maximum charging current with the intuitive single-button interface to up to 4A in 1A increments.
- **Battery temperature monitoring** that ensures safe charging conditions by constantly monitoring battery temperature.
- **Dead battery recovery** which automatically detects and recovers deeply discharged batteries, restoring them to full charge.
- **100W PD-compatible power source** for powering a variety of connected devices.
- **The integrated USB-C port** allows for versatile charging options and easy firmware updates.
- **Maximized efficiency with optional docking station** DS-2S or DS-4S.
- **No fan** = absolutely silent operation

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3. Control elements

1. OLED display protected by gorilla glass panel
2. Power status RGB LED
3. Charging / Power delivery status RGB LED
4. Gold plated battery connector
5. Slot for installing to DS-2S or DS-4S docking stations
6. USB connector
7. Switch for setting of charging current



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4. External power supply

To use the SB CHARGER, simply connect a USB-C cable to its USB-C port and the other end to a compatible external power adapter. For optimal performance and fast charging, we recommend using the BETSO YDS-065A power adapter, sold separately.

However, any certified USB-C power adapter with a minimum output of 15W can be used. Keep in mind that using a lower-rated power supply may result in charging errors. To ensure stable and efficient charging of your smart batteries, always meet or exceed the specified power requirements.



SB CHARGER is protected against overload and short circuits.



Warning: For extended periods of inactivity, disconnect the USB-C cable from both the SB CHARGER and the power supply to prevent unnecessary wear or potential issues.



Warning: Always use certified USB-C power supplies. Never connect an unreliable power source with a voltage exceeding the operating range of 20V DC. Failure to comply with these conditions may result in device damage and void the warranty!

5. Turning ON/OFF

Turning device ON	The device powers on automatically when connected to an external power adapter or when a smart battery is inserted.
Turning device OFF	Disconnect both the USB-C cable and the smart battery.



After powering on the SB CHARGER, the BETSO logo will appear on the display along with device information for 2 seconds. Once this is complete, the SB CHARGER will begin normal operation.



If the power source is weak or faulty, SB CHARGER will notify it with an error message on screen.

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6. Charging current menu setting

Enter the menu	short press of the button until setting is displayed
Exit the menu	wait 2 seconds
Change setting	short press of the button within 2 seconds
Confirm the setting	wait 2 seconds

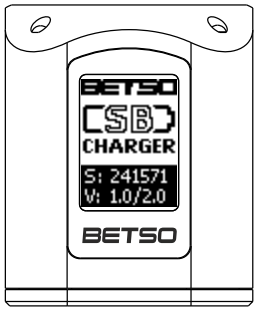
The button on the SB CHARGER is accessible only when no battery is inserted to prevent unintended presses. Please ensure that the battery is removed before attempting to use the button.

Changes are applied immediately after exiting the settings menu.

7. Informative screens and setting of SB CHARGER

Menu control is described in previous chapter 6 Charging current menu setting. The SB CHARGER display is also complemented by two RGB LEDs. For more information, refer to Chapter 8 Informative color LEDs interface.

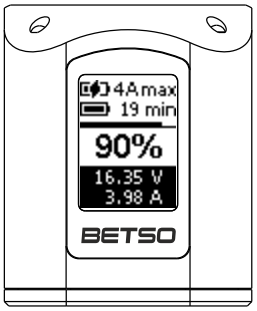
7.1 Start-up screen



After connecting the power adapter to the SB CHARGER, a startup screen will display the BETSO logo, device name, serial number, and hardware/firmware version. This screen can also be accessed by pressing and holding the button for more than 5 seconds, which resets the device's microcontroller. For detailed information, refer to Chapter 7.11 System.

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7.2 Main charging screen



The main screens of the SB CHARGER provide a comprehensive overview of charging information, ensuring users have real-time insights into the charging process. Each screen features five lines displaying key charging metrics. The last two lines (Screen "A" and Screen "B") alternate continuously at an interval of 1.5 seconds:

- **Maximum Current:** Displays the user-set maximum current limit (e.g., "4A max").
- **Time to full charge:** An estimated time until full charge in minutes.
- **Charge Progress:** Graphical representation of the battery's charge level, featuring an animated bar graph with a large percentage indicator.

Screen "**A**"

- **Voltage:** Provides caharging voltage (e.g., "14.75V").
- **Current:** Provides caharging current (e.g., "0.94A").

Screen "**B**"

- **Battery Temperature:** Shows the temperature of the charging battery (e.g., "37.5°C").

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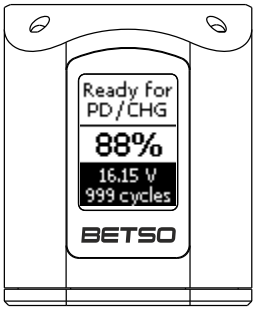
- **Charging Cycles:** Reveals the number of charging cycles the battery has undergone, providing valuable insights into the battery's usage history (e.g., "999 cycles"). This information assists users in monitoring safe charging conditions and assessing overall battery lifespan.

Charging begins automatically when the battery is connected and the SB CHARGER is powered on.

Screens "**A**" and "**B**" will switch automatically with a period of 1.5 seconds.

The SB CHARGER features automatic battery cooling. When the maximum temperature limit is reached, charging is temporarily interrupted and will resume normal operation once the battery cools down. This status is indicated on the display by the 7.7 Battery cooling pause screen.

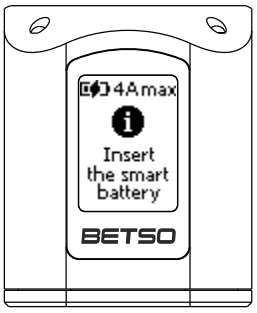
7.3 Ready for Power delivery / Charging



When a battery is plugged in but no power is connected a standby screen is displayed with the text "Reday for PD/CHG" below which is a bargraph with a handy animation actively showing the current state of charge. In the middle of the screen is a large battery percentage indicator. There are two more lines at the bottom of the screen with additional battery status information. The battery voltage and number of charge cycles are periodically alternated with the charging current and battery temperature.

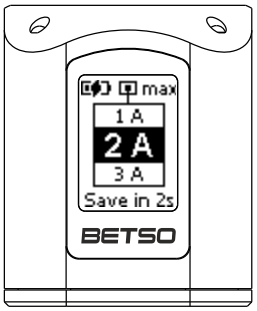
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7.4 Unplugged battery



If the battery is not detected when the charger is turned on or if the user disconnects the battery, the display changes to the "Unplugged battery" screen. This screen shows a visual notification in the form of the symbol "i," prompting the users to insert the smart battery.

7.5 Setting the maximum charging current



Customizing the charging process to suit your preferences is simple with the SB CHARGER's adjustable maximum current flow settings. The maximum current flow determines the rate at which your smart batteries charge. Selecting the appropriate current flow setting optimizes charging efficiency for your specific requirements.

The available options to limit the maximum charging current flow to the smart battery **1A**, **2A**, **3A**, and **4A**. The chapter 8 Informative color LEDs interface may provide more information if you experience issues with slow charging.

Ensure that no smart battery is inserted into the SB CHARGER in order to access the button, and that the SB CHARGER is powered on. Here's a breakdown of how to navigate to this feature and confirm your setting using the button:

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enter the setting	short press the button
change setting	consecutive short button presses
save setting	when the desired setting is chosen, wait 2 seconds

The charging current is automatically adjusted to ensure that it never exceeds the safe limit specified by the battery manufacturer.

The scrolling is infinite; upon reaching the top or bottom, it seamlessly transitions to scrolling in the opposite direction as long as the user continues to press the button.

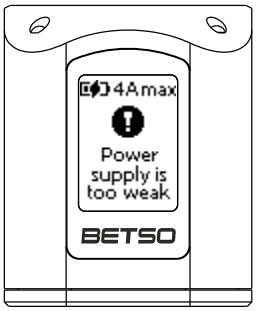
The bottom part of the display indicates the confirmation process by showing the text "Save in 2s." This straightforward prompt reminds users that the selected current flow setting will be saved if they wait for 2 seconds. Once the setting is saved, the screen will switch back.

7.6 Charging error screens

The charging error screens on the SB CHARGER are designed to promptly communicate and address issues related to the charging process. While any of the error screens are displayed, a protective measure intervenes to prevent the SB CHARGER from charging batteries under suboptimal conditions. This not only safeguards the charging equipment but also contributes to the overall longevity and safety of both the charger and the connected batteries. Here is a detailed list of error alerts:

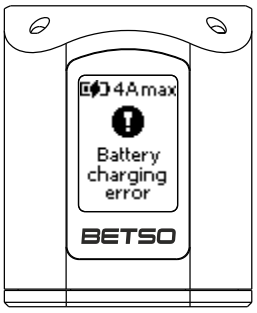
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7.6.1 Too weak power supply



The minimum required power for the SB CHARGER is 5W and 5V. In the case of a weak or inadequate power supply, the screen displays a message "Power supply is too weak" with an exclamation mark symbol. This alert notifies users that the connected power source doeas not meet the minimum requirements for charging.

7.6.2 Battery charging error



If the error is caused by the connected battery, the screen displays an exclamation mark symbol, accompanied by the message "Battery Charging Error." This visual alert indicates that there is an issue with the smart battery or the power supply, prompting users to investigate and resolve the problem.

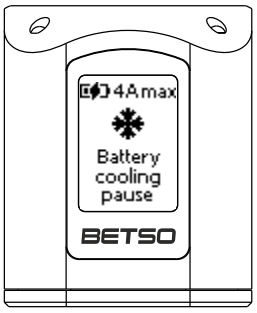
If this error occurs, check the power supply to ensure it meets the minimum requirements, or inspect the battery for potential defects or issues that may hinder the charging process.

Warning: In case of persistent errors, do not attempt to fix or disassemble the SB CHARGER. Instead, contact your BETSO distributor for professional

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assistance to ensure safety and maintain the integrity of the device.

7.7 Battery cooling pause



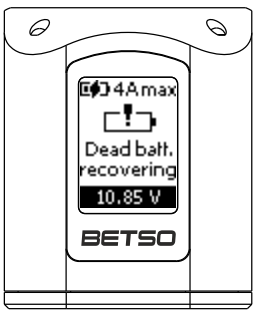
The battery cooling pause screen on the SB CHARGER plays a crucial role in managing and optimizing the charging process. When the temperature of the charging battery reaches the maximum limit, the battery cooling function intervenes, and a cooling alert is displayed.

The appearance of the "Battery Cooling Pause" screen serves as a visual notification to the user that a temporary pause in charging has occurred. This transparency ensures that the user is informed about the charging status and the reason behind the pause.

If this screen is displayed, wait for the battery to cool down. Charging will then automatically resume, and the displayed message will disappear.

If possible, charge your batteries in a cool and dry place. If you observe that the battery cooling pause screen persists or appears frequently, stop the charging process and make sure the conditions for charging are optimal.

7.8 Dead battery recovering

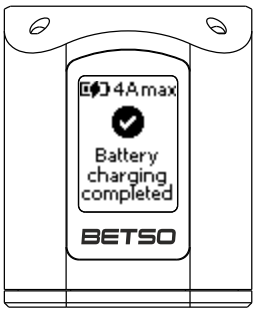


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When a dead battery is detected, the recovery process starts automatically. This is indicated by a screen with an exclamation mark in the battery and the text "Dead battery recovering". SB CHARGER will charge the battery first with a small current. When the battery reaches a healthy level, it will start charging at full speed. At the bottom of the screen, the charging current and voltage information periodically alternates.

The SB CHARGER will firstly initiate gentle charging with a low current. After the battery reaches a healthy level, it will start charging at full power and the information screen will switch to the 7.2 Main charging screen.

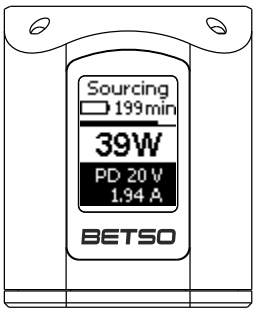
7.9 Charging complete



The Charging Complete Screen on the SB CHARGER is a visual confirmation that the connected battery has reached its full charge. When the charging cycle is complete, the confirmation screen is displed wtih a checkmark symbol and the text message “Battery charging completed“ confirming that the battery has been successfully charged.

This screen disappears when the battery is removed or the charger unplugged.

7.10 Sourcing screen



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If a USB-C device is connected to the SB CHARGER and the charger is capable of providing power to it, the display will change to Sourcing screen and the sourcing will automatically start. This is labeled by the text "Sourcing" below which is the estimated time to discharge. In the middle, an animated bargraph is displayed with a large percentage indicator of the current battery level. The last two lines periodically alternate the information of the current battery voltage with the discharge current and the chosen PD contract with the output current.

7.11 System

This sections covers SB CHARGER identification and versions.

7.11.1 **Serial number** - serial number of SB CHARGER

Serial number provides unique identification for your SB CHARGER for warranty and technical support. Serial number can be viewed on the start-up screen.

7.11.2 **HW version** - version of hardware of SB CHARGER

Version of SB CHARGER motherboard hardware can be found on the start-up display as described in chapter 7.1 Start-up screen.

7.11.3 **SW version** - version of software of SB CHARGER

Version of SB CHARGER firmware can be found on the start-up display as described in chapter 7.1 Start-up screen.



Actual firmware can be found at https://www.betso.eu/support. See chapter 9 Firmware updating for the firmware update procedure.

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8. Informative color LEDs interface

The RGB LEDs integrated in the device play a significant role in providing visual indicators for various states and together with the display create a comprehensive information system. These LEDs illuminate in three different colors (red, green, blue) and serve as a user-friendly interface to convey information on power status, charging and operating modes. This section outlines the RGB LED states and their corresponding meanings to enhance user understanding and interaction with the device.

8.1 Power status LED (left side)

Charging mode

- Power source is capable to deliver 65W or more — **BLUE**
- Powering from external power source (min. 12V) — **BLUE**
- Power source can supply at least 45W (min. 15V) — **GREEN**
- Power source cannot supply at least 5W (5V) — **RED**
- Power source is too weak, charging is not allowed — **“breathing” RED**

Power delivery mode

- Active sourcing, current over 50mA — **GREEN**
- Active sourcing, current over 50mA, SoC below 10% — **“breathing” RED**

8.2 Charging / PD status LED (right side)

- Battery is not connected — **no light**
- Charging error — **RED**
- Charging — **“breathing” RED**
- Charging, battery is charged to more than 90% — **“breathing” GREEN**
- Charging is complete — **GREEN**
- Firmware updating — **blinking BLUE**

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9. Firmware updating

SB CHARGER is ready for easy firmware updates when a new version is released. This ensures that you always get all the latest features and maximise the potential of the device. We listen to our customers' needs, so stay tuned.

Updating process:

- Visit https://www.betso.eu/support and download the latest firmware.
- Extract the zip file contaning the latest firmware file to your computer.
- Press and hold the button before connecting the SB CHARGER to a computer.
- After connecting the SB CHARGER to the computer, it appears as a USB flash drive.
- Copy the file (with the *.uf2 extension) of the latest firmware to SB CHARGER.
- Wait for firmware update.
- After the firmware is successfully updated, the device will automatically turn on.

Warning: Never disconnect the SB CHARGER from the computer during a firmware updating process. Interrupting the updating process may damage the device.

Warning: Update only with the official firmware. Use of unofficial firmware will result in loss of warranty.

10. Recommended accessories

Optional accessories include charging docks BETSO DS-2S and DS-4S (available in two sizes with a choice of two or four slots, allowing you to power up to four SB CHARGERs simultaneously), BETSO YDS-065A (65W PD power adapter) and power cables BETSO SBCC-XLR and SBCC-CAR.

For the latest information about our products BETSO please contact your local distributor or visit our websites https://www.betso.eu.

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11. Troubleshooting

It is not possible to turn on SB CHARGER

Most probably the power source of SB CHARGER is dead or a faulty USB-C cable is used. Please insert a new power source or try using a different cable. If problem still remains, please contact your BETSO distributor.

12. Safety instruction



Warning: Never open an electrical device! All reparations must be performed by an authorized service center. In the case of opening of the device away from the authorized service center, you will automatically loose the warranty of the device.



Warning: Do not use the electrical device in the places with high humidity, especially take care to protect the device against direct contact with water.



Warning: To clean the device, disconnect it from the power source and use a dampened piece of cloth. Never use any chemical solvents!

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13. Technical specifications

Power Input	USB-C: 20V / 3.25A (for 65W charging), accepts all profiles External DC (through USB): 9V - 18V, 5A max.
Charging current	1 - 4A (in 1A increments)
Supported batteries	14.4V Smart 2054-style, all vendors and capacities supported
Output Power	Charging 65W max.
	USB PD Output 100W max.
Display	Graphic OLED 0.71" white LED display 48 x 64 pixels protected by durable Gorilla Glass panel
USB PD profiles	5V / 9V / 12V / 15V / 20V up to 5A
Cooling	Passive cooling (fanless design)
Mechanic construction	CNC milled, anodized aluminium alloy
Dimensions (w x h x d)	86 x 28 x 34 mm (3.39" x 1.1" x 1.34")
Weight	approx. 98g (without battery)

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14. EC Declaration of conformity

BETSO ELECTRONICS s.r.o.

Ke Drackam 1603, 156 00 Praha 5 - Zbraslav, Czech Republic

Reg. Number: 28955706

declares that this device

BETSO SB CHARGER

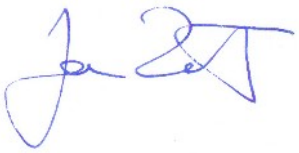
specification: 65W powerful smart battery charger and 100W Type-C PD compatible power source

conform to the essential requirements of the following European Directives and their associated norms:

Directive	Applicable Standards	Description
EMC	EN 55032:2015 EN55035:2017	Electromagnetic compatibility of multimedia equipment
Safety	EN 62368-1 2014	Audio/vide, information and communication technology equipment – Part 1: Safety requirements
RoHS	EN IEC 63000:2018	Technical documentation for assessment of electrical and electronic products with rspect to the restriction of hazardous substances

Conformity assessed via Annex III. using a Technical Construction and Results of measurements.

September 2024



Ing. Jan Zastera, general manager

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