Volta 500 Portable Power Station

Product Manual

This Product Manual contains important instructions that should be followed during the operation of the Stage Zero Volta 500 product. The information contained in this manual is subject to change by Stage Zero (Pty) Ltd (hereinafter referred to as Stage Zero) without prior notice. Please refer to the Stage Zero Customer Portal for the latest version of the Product Manual.

CONTENTS

1. Safety Precautions 3

1.1 General 3

1.2 Risk of Unsafe Operation 3

1.3 Shock Hazard Warning 3

1.4 Battery Safety 3

1.5 General Safety 3

1.6 Emergency Situations 3

1.6.1 Leaking Batteries 3

1.6.2 Fire 4

1.6.3 Wet Batteries 4

1.7 Prohibitions 5

2. Product Information 5

2.1 General 5

2.2 Specifications 6

2.3 Views 7

2.4 Installation 8

2.5 Device Specific Safety Precautions 8

3. Operating Instructions 9

4. Care And Maintenance 9

5. Customer Portal 9

5.1 How to submit a ticket 10

6. Troubleshooting 11

7. Warranty 11

8. Legal Notice 12

8.1 Information contained in this manual 12

8.2 Disclaimer and Indemnification 12

9. Queries and Support 12

1. Safety Precautions

1.1 General

This section contains important instructions that should be followed during operation of the Volta 500 Unit (hereinafter referred to as "Device/s").

It is important and necessary to read the Stage Zero User Manual carefully before using the Device. Failure to do so or to follow any of the instructions or warnings contained in said document can result in electrical shock, serious injury, or death.

1.2 Risk of Unsafe Operation

When using this Device, basic safety precautions should always be followed to reduce the risk of personal injury. Improper operation, maintenance or modification of this Device could result in serious injury and property damage. This Device may not be modified and/or used for any application other than for which it was designed for.

1.3 Shock Hazard Warning

Any contact with electrically active parts of the Device, such as electrical terminals can result in injury or death, irrespective of whether the Device and the other electrical equipment of the property have been disconnected.

1.4 Battery Safety

The Device contains $LiFePO_4$ cells (battery).

The following safety instructions must be followed:

- Do not locate the Device near external heat sources or in direct sunlight.
- **Do not attempt to open the Device and connect additional batteries of any type.**
- Do not pack flammable or hazardous materials around the Device.
- Do not generate steam or store corrosive chemicals in the vicinity of the Device.
- Do not mutilate the batteries, the batteries contain an electrolyte that is toxic and harmful to the skin and eyes.

1.5 General Safety

The following list highlights the general safety precautions that need to be followed:

- Before attempting to operate the Device and other electrical equipment, all instructions should be read and understood. All other maintenance and repair requirements must be reported to the help line (via the customer portal) who will arrange for the necessary work to be conducted.

- **Reliance on Life Sustaining Equipment**
  - The backup services are scoped on variable assumptions that may change over time and should **NEVER** be relied on as sustainable source of power for any life sustaining equipment.
  - Examples of life sustaining equipment include, but are not limited to, breathing apparatus, life monitoring systems or lung and heart respiratory machines.
- This device is intended for **indoor use only**. To prevent the risk of fire or electric shock, locate the Device in a temperature (0 – 40 °C) and humidity controlled indoor area, free of conductive contaminants.
- **Do not** allow children to touch or handle any part of the Device under any circumstances.
- **Do not** repair problematic Devices (except for fuse replacement) on your own. If the Device is faulty or not operational, please call the help line for assistance or log a ticket via the customer portal.
- This Device is not intended for operation by persons (including children) with reduced physical, sensory, or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning operation of the Device by a person responsible for their safety.
- It is hazardous for anyone other than a competent authorised Stage Zero accredited Contractor to carry out any service or repair on the Device.

1.6 Emergency Situations

1.6.1 Leaking Batteries

If the Device (or any part thereof) has any indication of a liquid like substance leaking from it, avoid contact with the substance and contact Stage Zero **immediately.**

If one is exposed to the leaked substance, immediately perform the actions described below:

- Inhalation: Evacuate the contaminated area and seek medical attention.
- Contact with eyes: Rinse eyes with flowing water for 15 minutes and seek medical attention.
- Contact with skin: Wash the affected area thoroughly with soap and water and seek medical attention.
- Ingestion: Induce vomiting and seek medical attention.

1.6.2 Fire

NO WATER!

DO NOT use water to extinguish fires that arise from the Device (or any part thereof). Should a fire occur, use a specialist Lithium fire extinguisher to extinguish the fire, alternatively use a DCP (dry powder) or CO2 (carbon dioxide) type fire extinguisher.

1.6.3 Wet Batteries

If the Device (or any part thereof), is wet or submerged in water, do not let people access it, and contact Stage Zero for technical support.

1.7 Prohibitions

It is prohibited to:

- Connect any additional batteries of any type to the Device
- Disassemble the Device (or any part thereof) in any form or manner
- Cosmetically change the exterior of the Device, e.g., painting, etc.

2. Product Information

2.1 General

The Volta 500 is an uninterrupted portable power station that can be used to power selected appliances/devices when the main electricity power fails (i.e., during loadshedding). The changeover from grid to 'back-up' power occurs automatically and once the device is connected to the selected loads requires no input from the user.

The Device consists of a packaged unit that has an integrated battery (Lithium Iron Phosphate, LiFePO4) and battery charger which utilises grid power to charge the batteries during non-loadshedding periods.

The Device has a rated output power supply of 500W and a battery capacity of 1152Wh (@ DOD of 90%) and during outages, can supply uninterrupted back-up power to appliances with a single load of ≤500W or a combination of appliances with a collective load of ≤500W for approximately 2½ hours (if batteries were fully charged).

Examples of typical loads:

- Small non-heat generating house-hold equipment (e.g., medium sized home entertainment system)
- Office equipment (e.g., PC, laptop, Wi-Fi Router, small/medium sized printer, scanner, etc.)
- Charging of mobile connectivity devices (e.g., cell phone, tablet, etc.)

During loadshedding, the system will supply back-up power for a time period dependant on:

- Load/s connected to the Device
- Whether the Device's battery was fully charged at the time when the power failed (load shedding)

The Device's battery, under normal circumstances, should take approximately 5 ½ hours to fully charge from the point where they were completely discharged.

Figure 1: Solution Block Diagram

2.2 Specifications	
Product	
Type	UPS Backup Power
Capacity	1280Wh Max (1152Wh @ 90% Depth of Discharge)
Rated Output Power	500W
Peak Surge Power	1000W
Battery Type	LiFePO4 (*Lithium iron phosphate*)
Input Voltage	220-230 VAC (*C14 socket*)
Output Current (Max)	5A (*fuse protected*)
Output Voltage	5VDC @ 1.2A 220-240 VAC @ 5A
Thermal Dissipation	Passive (Air vents in front and rear panels; Inverter & Charger internal fan)
Discharge Rate	0.4C (±40A DC)
Charge Rate	0.17C (16A DC)
Operating time at 500W (No AC input)	2.3hrs max
Charge Cycle	5.4hrs min
Over Current Protection	Replaceable 5A Fuse
Mechanical	
Dimensions (H x W x L)	360 x 360 x 160mm
Weight	15.1kg
Environmental	
Operating Temperature	0 - 40°C
Operating Temperature (Optimal)	15 – 35°C
Operating Humidity	10-90% (non-condensing)
Storage Temperature	-20 to 60°C
Ingress Protection Rating	IP20
Miscellaneous	
Input	x1 C14 socket
Output	x1 USB A socket x1 Switched three point plug socket, SA
Status Indicator / Display	None
Accessories	C13/3-point plug cable ("kettle plug"), 10A, 1.5m
Fuse	5A, 5x20mm, Cartridge Fuse

Refer to technical datasheet for more detailed information regarding the Device

2.3 Views

Figure 2: Isometric (Front)

Figure 2: Isometric (Front, Side, Rear)

Figure 2: Isometric (Top, Bottom)

1. AC Power Input (C14 Socket)
2. Fuse Holder
3. Product Power Switch (on/off)
4. AC Power Output (3 point plug socket, SA)
5. AC Power Output Switch (on/off)
6. DC Power Output (USB-A)

Figure 5: User Interfaces

2.4 Installation

The Device is a plug-and-play solution. Other than adhering to the safety precautions and operating instructions, there are no other installation requirements.

The following is supplied with the Device:

- Volta 500 unit
- AC Power Input Cord - C13/3-point plug cable, 10A, typ. 1.5m ("kettle cord")
- User manual

Plug-and-play:

- Ensure Device's power switch is in 'off' position.
- Connect the AC Power In cable (supplied with product) into the C14 socket located on the rear.
- Connect the 3-point plug of the AC Power In cable into a standard wall plug or extension cord (220-230VAC, 50Hz). Only adequate rated extension cords may be used.
- Switch on at the Device's power switch.
- Device is ready for operation.

2.5 Device Specific Safety Precautions

Following precautions to be adhered to for safe use:

- **DANGER** The Device generates the same potentially lethal AC power as household wall outlets, even when not connected to an AC supply.

- **DANGER** The Device contains internal batteries and may present a shock hazard even when disconnected from AC power.
- **DANGER** If the Device emits smoke or unusual odours, immediately switch Device into the 'Off mode'. Contact Stage Zero immediately.
- **DO NOT** let the Device be subjected to direct water. It is **NOT** water resistant.
- **DO NOT** locate the Device in direct sunlight.
- **DO NOT** move/relocate the Device whilst in operation.
- **Only** use the AC Power In cable ("kettle plug cable") supplied with the Device.
- **Ensure** the AC Power In Cable and/or extension lead is placed such as **NOT** to cause a tripping hazard.
- **DO NOT** obstruct the air vents of the Device (located on front and rear panels).
- **DO NOT** insert foreign objects into electrical outlets or air vents.
- **DO NOT** stack anything on top of the Device.
- **DO NOT** place any heat sources (e.g., open flame, heaters, etc.) in proximity of the Device.
- **Minimise** strenuous vibration during transport. Vibrations and impacts may cause damage to or dislodge internal hardware.

3. Operating Instructions

- Connect devices/appliances to be powered into the USB-A (located on the front) and/or 3-point plug socket (located on the rear).
- Switch on AC output power switch.

Note:

- *The single or collective load of the appliances/devices connected to the Device must not exceed 500W.*
- *Refer to device/appliance specification label for power operating requirements (watts).*
- *Ideal operating temperature range is 0 - 40°C.*

4. Care and Maintenance

- If the Device is to be stored for a prolonged duration, it is advised to charge the Device to 80% every 6 months to extend the lifespan of battery. Remember to turn off the Device before storing.
- Device to be stored in a dry and cool environment.
- Do not use corrosive chemicals or aerosols to clean this Device.
- From time to time wipe the outside of the Device with a soft DRY cloth. Do not subject the Device to water OR use a wet cloth to wipe the Device.

5. Customer Portal

The Customer portal is where the User can review, order and manage Stage Zero solutions. It is also from where the User can request support via logging a ticket on the Help tab.

The Customer Portal has the following tabs:

- **Dashboard** (default) – general overview of account.
- **Accounts** – detailed overview of customer's account containing personal information, account payments and billing, installation Certificate of Compliance and application documentation. The User can also settle payments from the Accounts tab.
- **Services** – general overview of what services (subscriptions) are contracted and paid for.
- **Messages** – list of messages regarding account/device status.
- **Help** - allow the customer to submit a ticket/query when a fault occurs.

Note:
When a serious issue occurs such as a fire or complete power outage outside of loadshedding, it is recommended to call the Stage Zero help line which is shown on the customer portal under the help tab.

Figure 6: Example of Dashboard

5.1. How to submit a ticket

Use the following steps to log a ticket on the Customer Portal:

1. Navigate to Help tab from the Dashboard
2. Select '*Submit* Ticket'
3. **Select Service** - From drop down, select most applicable option for type of ticket, e.g., account, PPA service, hardware service, inverter service, solar panel service, etc.
4. **Problem Subject** - Insert a brief description of the problem, e.g., for a noisy inverter use 'Inverter noisy'
5. **Request Description** - Insert more detailed description of the problem
6. Attach any supporting information of the problem, e.g., photos, video clips, etc.
7. **Submit**

Figure 7: Example of Ticket

All tickets that have been logged will be time stamped and can be tracked either on the dashboard or on the help tab.

6. Troubleshooting

#	Problem	Possible Cause	Solution(s)
1	**The Device is making a beeping sound**	The Device is overloaded (*single/combined load of more than 500W*)	• Switch off Device and check that connected load does not exceed 500W (use device specification labels). • If devices do not exceed 500W, switch on Device and if beeping noise does not reoccur, continue operation. • If connected devices exceeds 500W, disconnect excessive devices and switch on Device.
		The Device's batteries are depleted and does not have enough capacity to sustain the load/s (applicable during loadshedding only)	• With AC input available (i.e., no loadshedding), wait for the battery to be replenished
		Faulty Device	• If beeping sound persists when the Device is not overloaded and batteries are replenished, halt operation and log a ticket (via Customer Portal)
2	**No or diminished power output supply from Device to connected loads**	Blown fuse (caused by overloading the Device)	• Check/replace fuse located at the rear (in fuse holder). • If the fuse is functional and the unit is still not supplying output, halt operation and log a ticket (via Customer Portal)
		Faulty Device	• Halt operation and log a ticket (via Customer Portal)
3	**The Device has physical damage and/or a fluid like substance is discharged from it**	Physical damage to Device	• In case of fluid like substance, avoid contact • Halt operation and log a ticket (via Customer Portal)

7. Warranty

Stage Zero warrants this Device against defects in materials and workmanship. This warranty does not apply to defects resulting from normal wear and tear or accidents; damages sustained during: alterations; unauthorised use or repair; neglect, misuse, abuse; and failure to follow instructions for care and maintenance for the product.

8. Legal Notice

8.1 Information contained in this manual

- Stage Zero gives no warranty of any kind whatsoever, either explicitly or implicitly, with respect to the information contained herein.
- Stage Zero's copyrighted designs, products and processes contained or described in this document are confidential. This document, either in part, or as a whole, may not be copied or reproduced by any means whatsoever, nor disclosed to third parties for purposes other than for which it is supplied, without the prior written consent of Stage Zero and shall not be furnished to any third party without the prior written consent of Stage Zero.
- Stage Zero, its subsidiaries, the directors, employees, and agents cannot be held liable for the use of and reliance of the information in these documents.

8.2 Disclaimer and Indemnification

Stage Zero shall not be liable for:

- The losses of damage to property, death or personal injury arising from non-compliance with this Stage Zero User Manual.
- The losses not caused by Stage Zero's negligence.
- Stage Zero shall not be liable to either Customer or any other third party under any applicable law, law of delict, in equity, restitution or otherwise for any kind of indirect or consequential loss or damage including loss of actual or anticipated profit or revenue, loss of use or productivity, loss of production or business interruption, loss of goodwill, loss of any contract or loss of opportunity that is connected with any claim arising under or in connection with use of the Stage Zero Device.
- By operating the Stage Zero Device, you indemnify Stage Zero and shall hold Stage Zero harmless against any liability arising from non-compliance with this Stage Zero User Manual.

9. Queries and Support

Email support@stagezero.co.za or visit www.stagezero.co.za for more information.