



User Manual

Bluevolt Leopard UPS



Manufactured in South Africa by Blue Volt Energy (Pty) Ltd

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Introduction

The Bluevolt Leopard LiFePO4 UPS power system, developed by Blue Volt Energy (Pty) Ltd, stands as a testament to our unwavering dedication to innovation and exceptional quality. The Bluevolt Leopard UPS is an **extremely capable mobile UPS power system** with a robust battery and **transformer-based inverter**. Able to **operate silently**, it is well suited to **apartment-living**. **Connection to and disconnection from the mains DB is quick and simple**. This guide serves to assist you through the installation and commissioning stages of the Bluevolt Leopard UPS. This manual is updated periodically; please ensure that you have the latest version.

Blue Volt Energy (Pty) Ltd T/A Bluevolt

Location: 245 Albert Amon Rd, Meadowdale, Johannesburg, 1614

Website: www.bluevolt.co.za


Support:

For queries regarding installation or technical issues, please liaise with your distributor or reseller.

Advanced Technical Support:

Should you require more specialised technical assistance, please contact

info@bluevolt.co.za

 **Warning:** Adhering closely to the steps provided is crucial to the guaranteed optimal performance and durability of your Bluevolt Leopard UPS.

Depth of Discharge

The Bluevolt Leopard UPS can be fully discharged to a depth of discharge (DoD) of 100%. The low voltage disconnect setting on the inverter limits DoD to approximately 90%. Limiting the DoD will prolong the life of the battery.

Transport and Handling

Each Bluevolt Leopard UPS is securely packed in a durable plywood crate. To safely unload the Leopard UPS from a vehicle, either two strong people or appropriate machinery, such as a pallet stacker or forklift, are necessary. It is vital to ensure that the unit stays upright. Placing the battery in any alternative orientation or subjecting it to impacts or excessive vibration will void the warranty.



Photo of Bluevolt Leopard UPSs packed into crates

Installation

The Bluevolt Leopard UPS is straightforward to connect. Simply plug in the AC input plug and cable to an AC wall outlet (plug socket) and plug your devices into the AC output plug socket on the Leopard UPS. Refer to the labelled images provided below.

The Bluevolt Leopard UPS also features an innovative design for seamless integration with mains distribution boards (DB). It employs spring clamp connectors within a junction box, specifically engineered to facilitate straightforward connections to the DB. This design choice underscores the product's emphasis on ease of installation and functionality, aligning with the requirements for efficient and reliable electrical connections.



Image showing the cables and connectors inside the junction box

Refer to the accompanying image for guidance on connecting to the mains distribution board. Connection of input and output cables should be carried out exclusively by a certified electrician. A distribution board (DB) upgrade is necessary for connection. This upgrade entails a division within the DB, isolating essential circuits from those of the geyser and stove. It may include assigning specific plugs to essential circuits and the installation of an additional mini surface mount DB alongside the main DB, equipped with a changeover switch. The Certificate of Compliance (COC) is valid up to the changeover switch, allowing future upgrades without recertification.

The specialised DB connection is cost-effective, requiring only an electrician and not an inverter installation specialist. This feature is particularly advantageous for renters or individuals planning to enhance their system or upgrade to a larger power system in the future. By contrast, systems with various components mounted on the wall can constitute permanent fixtures and be costly to move. The Bluevolt mobile power system can be disconnected in under 2 minutes. Reselling a complete Bluevolt mobile power system will be simpler and retain higher resale value than various loose components will after unbolting them from the wall.

The wheels on the unit are designed for use on smooth interior floors. Moving the system around on rough surfaces should be avoided to prevent damage to the wheels. Larger wheels for rough ground can be fitted if required; please let us know your requirements so that we can design according to your application.

For optimal cooling, maintain a minimum clearance of 20 cm around the vents.

i Note: To free the cable bushing, clamp vertically with a pair of pliers to compress the cable slightly, taking care to avoid scratching the paint.

Environmental Requirements

The Bluevolt Leopard UPS has been exclusively designed for indoor usage and has an IP20 ingress protection rating. Ensure it is positioned away from direct sunlight, heat sources and moisture.

For optimal battery longevity, maintain the surrounding temperature between 0 and 35°C. Higher temperatures will hasten the battery's degradation, while temperatures below 0°C will cause the battery BMS to block charging to prevent damage. It is essential to keep the system at a safe distance from heat sources to prevent overheating.

Detailed guide to buttons and controls

The labelled images below the various buttons and controls.



Figure 1: Bluevolt Leopard UPS overview with labels

1. Inverter display
2. AC INPUT cable
3. AC OUTPUT plug socket
4. Battery display
5. Lifting handle

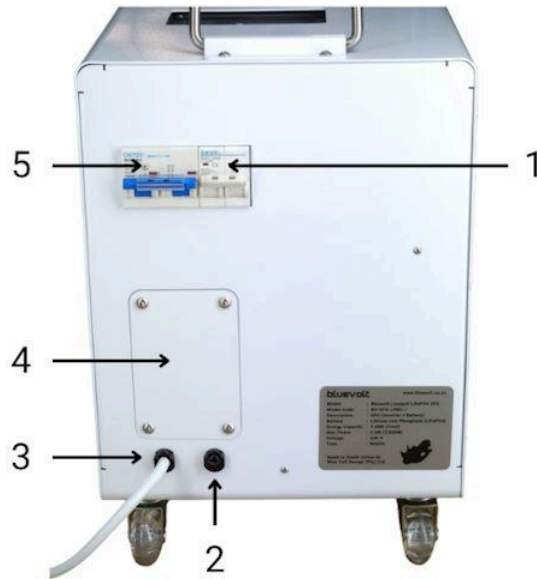


Figure 2: Bluevolt Leopard UPS circuit breaker view with labels

1. AC INPUT circuit breaker
2. Spare cable exit for AC OUTPUT
3. AC INPUT cable entry
4. Junction box cover panel
5. DC circuit breaker

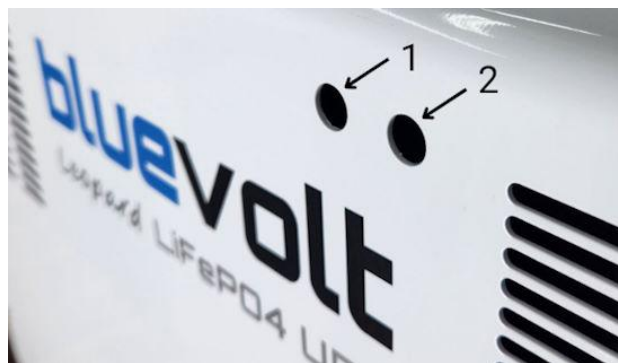
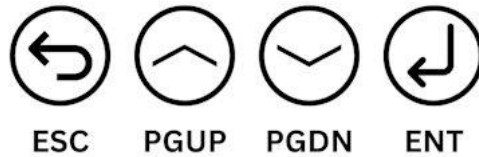


Figure 3: Bluevolt Leopard UPS inverter protection circuit breaker reset buttons

1. Output protection circuit breaker reset button
2. Input protection circuit breaker reset button

Charging settings

The Bluevolt Leopard UPS includes several charging modes. It can **charge silently** with the fan turned off, and it can **fast-charge** with the fan activated, resulting in increased noise. Instructions on how to select your preferred charging mode are provided here. Please note that choosing the slow charging option reduces heat output, thereby enhancing the battery's lifespan. This approach ensures the UPS operates efficiently while maximising battery longevity.



Button operations on inverter screen on top of unit

Procedure to set change charging setting

1. ESC (escape)
2. PGDN (page down) to scroll to "Setting"
3. ENT to enter settings menu
4. PGDN (page down) to scroll to "Batt Cap 2/7"
5. ENT to enter "Batt Cap" menu
6. Scroll up or down using PGUP or PGDN to select desired charge setting

| Setting | Description | Est. time to charge (0 - 80%) |
|---------|---------------------|-------------------------------|
| 100AH | Silent, slow-charge | 13h 30min |
| 300AH | Default setting | 4h 30min |
| 900AH | Fast-charge | 2h 30min |

7. ENT to select desired charge setting
8. ESC x2 to return to home screen

Adjusting settings not specified within the user manual within the inverter's menu is strictly prohibited. Unauthorised modifications may result in the voiding of the product's warranty.

Overcurrent protection

The battery is equipped with a **digital Battery Management System (BMS)** and an electronically controlled MOSFET circuit breaker. Additionally, it has AC and DC circuit breakers for overcurrent protection and isolation. The Bluevolt Leopard UPS is designed to deliver 2kW. Excessive overload must be avoided to prevent damage to the inverter and battery.

⚠ Warning: If a circuit breaker tripped during operation, there is likely a serious fault in a connected appliance, or the unit has been severely overloaded. It is very important to disconnect all loads immediately and have a certified electrician check your installation.

Solar

The unit can be connected to PV modules with a special upgrade and an external solar charge controller. Please contact Bluevolt directly if you are interested in this upgrade.

Storage

The unit can be stored for up to three months. First fully charge the battery, then switch all circuit breakers to the OFF position by pushing them down.

⚠ Warning: It is essential to push the DC circuit breaker down when the system is not in use to prevent the battery from over-discharging.

i Note: It is preferable to leave the Bluevolt Leopard UPS connected to an AC source to keep the battery charged. The charging system will keep the battery charged at a level that promotes battery longevity.

Troubleshooting

Introduction

This guide provides instructions to troubleshoot the Bluevolt Leopard UPS. If you have adhered to the steps provided and still face issues, please contact Bluevolt or the authorised reseller from whom you bought the power system.

Key Features

The Bluevolt Leopard UPS is designed for reliability. The transformer-based inverter can withstand the thermal stresses from overload more effectively than common 'high-frequency' inverters.


Aside from overload vulnerability, **competitor products** can be affected by '**black-start**' **issues** where the system does not switch on automatically following a complete discharge, for a variety of possible reasons. The Bluevolt Leopard UPS is designed in such a way that makes it **impervious to most of these issues**. It will **recover automatically** without reset buttons having to be pushed, without CAN connections having to be checked, and without any battery boosting to be done. For these reasons, the Bluevolt Leopard UPS is an excellent option for supporting telecoms and bank infrastructure in **remote areas**.

Possible Problems and Remedial Action


Bluevolt Leopard UPS beeped and stopped working (Overload)

Problem/Description:

The unit beeped and stopped working although the displays are ON. A red LED is on.

 Note: The system has various overload protections and this section covers the most likely scenario.

Cause/Solution:

 Warning: Unplug / disconnect any faulty equipment from the AC output before proceeding

1. The inverter may have shut down due to overload
 - a. **Remedial Action:** Switch the rocker switch on top from "Power Save", or "ON" to the "OFF" position. Then switch back to the "ON" position. The unit should continue operating normally. Check the power ratings of any appliances before connecting to the Bluevolt Leopard UPS and ensure that the total load is lower than 2kW.

Warranty & Repair

Please refer to the warranty document for the Bluevolt Leopard UPS.

Expected Product Life

Based on daily usage and an average depth of discharge (DoD) of 70%, the Bluevolt Leopard UPS has an anticipated lifespan of over 15 years

For attaining maximum battery longevity and obtaining the best value in terms of cost per kWh, maintaining an average Depth of Discharge (DoD) of between 50% and 60%, regulating the ambient temperature at around 20°C and refraining from imposing excessive loads on the system are recommended practices

i Note: Depth of discharge (DoD) refers to the percentage of a battery's energy discharged relative to its overall capacity.