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WARRANTY

Link to REVOV's warranty:
<https://revov.co.za/product-warranty-2/>

- 3 years or 2 000 cycles.
- During normal use, the unit can be discharged safely to 80% of its rated capacity. Battery life is shortened if the unit is discharged beyond its rated capacity.
- The battery must be charged 100% at least once a week if discharged to ensure warranty.

Before using the battery, be sure to read the user manual and precautions for handling.



REVOV 12.8V 200Ah 2.56kWh USER MANUAL v3



**FREEDOM
FROM DEPENDENCE**

WWW.REVOV.CO.ZA

Thank you for purchasing a quality REVOV product.

This document covers product operation, storage guidelines, safety & maintenance instructions.

Please do not discard this document as it contains valuable information that might have to be referenced at a later stage.

Please be sure to carefully follow these guidelines & instructions. Every line item here is important. Violation could cause deterioration of performance, premature failure, or damage to warranty.

Important Notice:

The manuals and documentation undergo regular updates. It is the sole responsibility of the client or installer to ensure they possess the most recent manuals or installation guides.

Furthermore, the installation must strictly adhere to the requirements specified in the SANS 60439:2004 standard, which applies specifically to low-voltage switchgear and control assemblies, having replaced the IEC standard 61439. It is emphasized that continuous web connectivity for the battery is not mandatory for warranty validity. Nevertheless, proof of installation quality is indispensable for assessment and validation purposes. Failure to provide sufficient proof may result in the warranty claim being declared null and void.

During the assessment or repair of the product, it is imperative to provide all pertinent information concerning the installation, system design, specifications, compliance, and other relevant details. Failure to produce this requested information will result in any warranty claim being declined.

Please be advised that the entire installation of the DC system must conform to the applicable codes and regulations as prescribed by the respective region or country. A valid Certificate of Compliance (COC) must be readily available upon request for the warranty associated with the specific installation. Failure to provide a valid COC will result in the warranty being rendered invalid.

Note that the warranty period will commence from the date of purchase.

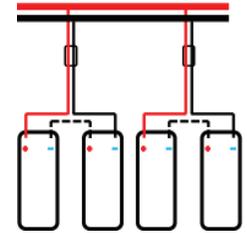
Find REVOV warranty here: <https://revov.co.za/product-warranty/>

Should you have any queries, please contact **REVOV's** technical support:
Number: 010 035 0680 • **Email:** support@revov.co.za

Parallel Configuration and Basic Circuitry

Should the installation require parallel configuration, please ensure the following steps have been met to safeguard performance and warranty,

- Units have been paralleled together i.e., 12V positive to positive, negative to negative for a 24hr period to ensure voltage parity prior to system connection and operation.
- All leads connecting 12V to 24V series connection are identical between paralleled sets.
- All positive and negative leads connecting 24V positive and 24V negative to common busbar are identical in length within 24V storage.
- Ensure the state of charge values for both batteries are the same in case of a series (24V) connection.
- In the case that paralleling batteries does not equalise state of charge, please charge each battery individually so that state of charge is the same for each battery.
- All positive and negative leads connecting 24V positive and 24V negative to common busbar are identical in length within paralleled sets.
- 24V set(s) are protected with two pole fuses according to product current rating i.e., 12 – 24V at 80A protection.



Downloading BMS Bluetooth App:

- Scan QR code to download XiaoXiang BMS app.
- Once downloaded open the app & allow access to location.
- The app will show serial codes.
- Click the serial code for your battery/batteries. Your **REVOV** 12V battery serial code can be found on the top of the battery.
- The app will then ask for a password. The password is 123456.
- A pop up will appear asking to use GPS to test speed, click yes.
- Your batteries dashboard will appear
- You are now connected to your **REVOV** 12V battery via the XiaoXiang BMS App which allows you to view your battery's total voltage, remaining capacity, temperature, and time left until fully discharged.



Quarantine & Leaking Product

- Packages that are crushed, punctured, or torn open to reveal contents should not be transported.
- In the event that damage to packaging results in the release of cells or batteries, the leaking products should be promptly collected and separated, and the shipper should be contacted for instructions.
- Such packages should be isolated until the transporter has been consulted, provided instructions and, if appropriate, arranged to have the product inspected and repacked.
- Keep away from fire when leakage or foul odours are detected. If liquid leaks onto your skin or cloths, wash well with fresh water immediately.
- If liquid leaking from the battery gets into your eyes, do not rub your eyes. Wash/flush eyes with clean water and go to see a doctor immediately.
- If the terminals of the battery become dirty, wipe with a dry cloth before using the battery.



Safety Precaution and Injunctions

To ensure product safety, describe the following precautions in the instruction manual of the application. **(!Danger!)**

Electrical

DO:

- Use a dedicated charger.
- Use or charge the battery only in dedicated applications.

DO NOT:

- Charge the battery by an electric outlet (grid) directly.
- Reverse charge the battery and/or short circuit.

Environmental Misuse

Temperature may not be over 45°C.

DO NOT:

- Leave the battery near a fire or a heated source.
- Throw the battery into a fire.
- Immerse, throw, wet the battery in water/seawater.
- Store the battery in a pocket or a bag together with metallic objects.
- Short circuit the (+) and (-) terminals with metallic object in any way and at any time.
- Pierce the battery with a sharp object.

- Heat partial area of the battery with objects such as soldering iron.
- Hit with heavy objects.
- Step on the battery and throw or drop the battery to avoid mechanical shock.
- Disassemble the battery or modify the battery design including electric circuit.
- Use seriously scratched or deformed battery.
- Put the battery into a dryer, or high-pressure container.
- Use or assemble the battery with other batteries, different types and/or models of batteries such as dry batteries, hydride batteries, or nickel cadmium batteries.
- Use or assemble old and new batteries together.

DO:

- Stop charging the battery if charging is not completed within the specified time.
- Stop using the battery if the battery becomes abnormally hot, discoloured, deformed, or abnormal conditions are detected during use, charge, or storage.

| Item | Characteristics |
|---------------------|------------------------------|
| Weight | Approx ± 30kg's |
| Supplied SOC | Approx ± 50% |
| Discharge temp | 0 – 45°C |
| Charge temp | 0 – 45°C |
| Storage Environment | 15°C – 45°C @ 75% SOC |
| Storage cycling | 1 FULL cycle within 6 months |

Electrical Misuse

DO:

- Please follow the specific battery parameter setup.
- Charge battery with constant current/constant voltage (CC/CV) charge parameters and charge scenarios.
- Control the charge current by specified value to valves.
- Ensure that the maximum cell cut-off voltage of charge is below 14.2V.
- Ensure the cut-off discharging voltage is above 11.4V.
- Make certain the charger stops charging the battery by detecting either charging time, or voltage, specified in the battery specification.

DO NOT:

- Supply voltage higher than specified to the battery.
- Supply/draw current higher than specified to the battery.

| Item | Characteristics |
|--------------------------|-----------------|
| Nominal cell voltage | 3.2V |
| Nominal pack voltage | 12.8V |
| Nominal capacity | 200Ah |
| Nominal energy (Wh) | 2560Wh |
| Fully discharged voltage | 11.5V |
| Fully charged voltage | 14.1V |
| Float voltage | 13.7V |
| Standard charge current | 40A |
| Operating current | 0 – 70A |
| BMS peak current | 100A for 10sec |
| Internal resistance | ≤20mΩ |

Multiple (parallel configuration) batteries – 12V

- Always make sure batteries are an identical make and model (do not mix different makes or models).
- Make sure correctly rated and same length cables are used for connection to system.
- Make sure correctly rated fuses are used for protection of multiple sets.
- Make sure correct polarity connection is made i.e., positive to positive and negative to negative.

SPECIAL NOTE: When connecting more than two batteries i.e., series or parallel configuration. Connect the new and old on a common 12V point (positive with positive, negative with negative) to balance the voltage over a 24hr period prior to system integration

Procedure for reactivating batteries internal BMS – 12V

Should the battery be depleted further than stipulated cut-off voltage, please take strong consideration at expanding the storage within the system to avoid this situation in future.

- The batteries BMS may be brought out of protection by attaching jump leads to the separated unit from a stable source for 15 – 25 min.
- Utilising an external 12V trickle charger equipped with lithium charge profile, or charger with adjustable charge algorithms to suit.
- By attaching jump leads to the separated unit from another 12V fully charged source, i.e., fully charged unit of the same make and model.

LiFePO₄

Lithium Iron Phosphate cells are superior in terms of safety, over any other Lithium-ion battery chemistry, and has a higher life expectancy and a higher specific power. Every battery is a chemical machine that can store, contain and deliver considerable amounts of energy, even as it appears to be inert. Knowledgeable battery operation is always required. **LiFePO₄** is one of the safest chemical storage formulas and has a higher energy density and thus contain more pure energy per pack.

- Integrated Battery Management System (BMS).
- Light & compact.
- Water & dust resistant (IP56).
- Bluetooth app that allows for the measurement of the battery's total voltage, remaining capacity, temperature and time left until fully discharged.

Storage, Maintenance and Transportation

The mishandling of a lithium-ion cell may cause leakage, heat, smoke, an explosion, or fire.

Handling Precautions of Lithium Rechargeable Cells

- The batteries are heavy. Use precautions and do not drop the battery on toes, fingers, or body parts.
- Use correct heavy lifting procedures with a straight back. Use heavy lifting technique for battery handling, if required.
- Do not drop or bounce the battery, and do not slam the battery on the floor or deck.

Storage

- Store the cells at room temperature with variation of +/- 5°C is recommended, low humidity, no dust and no corrosive gas or liquid atmosphere.
- It is recommended to fully charge and discharge once every 6 weeks.
- It is recommended to avoid being crushed, impacted, smashed, sunshine or water flood (deluge).

Maintenance

The **REVOV BMS** will protect and ensure optimal battery life and performance. However, it must be noted that proper operation of the battery within the system is required for the BMS to fulfil its function and maintain the battery.

Cell balancing is an integral part of battery life and therefore imperative that proper/sufficient time be allowed for the charging cycle of the system. As the **REVOV BMS** is a top end balancing BMS, it will only start balancing the cells from 60% upwards with cell settling only happening at 100% or FLOAT and is therefore a critical requirement for a full charge, no less than every five days although a more ideal circumstance would be everyday in a properly designed cycle. Cell life cannot be guaranteed if proper charge cycles are not adhered to and/or insufficient charge times are provided for in the setting up of the equipment.