Power

www.gs-power.net

Instruction manual

GV-12V100Ah

GV-12V100Ah Smart

GV-12V200Ah Smart

GV-24V100Ah Smart

User Manual GV-Serie

Dear client,

this manual contains all the necessary information for installation, use and maintenance of GS-Power GV Series LiFePO4 batteries. We ask you to read these instructions carefully before using the product. In this manual, the GV series batteries are also referred to as LiFePO4 battery.

This manual is intended for the installer and the user of the LiFePO4 battery. Only qualified, certified personnel may install and maintain the LiFePO4 battery. Please refer to the index at the beginning of this manual to find the information relevant to you. While using the product, user safety must always be ensured so that installers, users, maintenance personnel and third parties can use the LiFePO4 battery safely.

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1. Safety guidelines and measures

1.1. General

- Do not short-circuit the LiFePO4 battery.
- Do not disassemble, crush, puncture, open or cut the LiFePO4 battery.
- Do not expose the LiFePO4 battery to heat or fire. Avoid exposure to direct sunlight.
- Do not remove the LiFePO4 battery from the original packaging until it is required for use.
- In the event of an electrolyte leak, do not allow the liquid to come into contact with the skin or eyes. In case of contact, wash the affected area with water and seek medical attention.

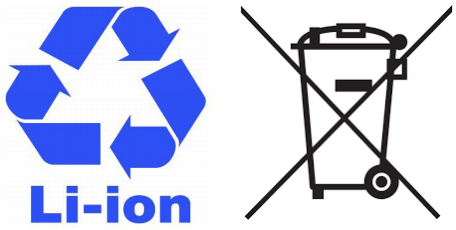
Always use a class 2 charger specifically designed for use with a LiFePO4 battery.

- Pay attention to the plus (+) and minus (-) markings on the LiFePO4 battery and on the unit and ensure correct use. Connect the positive cable first, and then connect the negative cable.
- Do not mix batteries of different manufacturers, capacities, sizes or types.
- Keep the LiFePO4 battery clean and dry.
- Second batteries must be charged before use. Always use the correct charger and read this manual for correct charging instructions.
- Remove the battery from the vehicle/vessel if it is to be stored for a long period of time and store it in a dry and frost-free place after charging.
- Switch off all consumers connected to the battery after use so that the battery is not permanently discharged.
- Do not leave the LiFePO4 battery charging on the charger for weeks.
- After prolonged storage, the battery must be charged with a class 2 charger.
- Keep the original product documentation or have the link to our website (www.GS-Power.net) ready.
- You can access the website via the QR code on the battery or the packaging. There you have the option of downloading these operating instructions.

- It is best to fully charge the battery after use and repeat this after longer storage. The battery has a low self-discharge rate (max. 2-3 % per month).

Do not charge the LiFePO4 battery below 0 °C / 32°F!
The BMS prevents the battery from being charged below 0° C.

1.2. Disposal

	Dispose the LiFePO4 battery in accordance with the local, state and federal laws and regulations. Batteries may be returned to the manufacturer. Do not mix with other (industrial) waste.

1.3. Safety symbols and markings on the product

You will find various safety symbols and markings on the product. These markings are shown below.

You must never remove these markings!

1.4 The meanings of the symbols:

	Wear eye protection
	Please observe the operating instructions
	Warning against corrosive substances
	Warning against explosive substances
	Open fire, smoking and ignition sources prohibited
	Please keep away from children!

2. Introduction

2.1. Description of product

GS-Power LiFePO4 batteries are lightweight, compact and offer a high level of performance. The LiFePO4 batteries have been specially developed for marine applications. Please note that LiFePO4 batteries must be handled differently from conventional lead-acid batteries. We would like to ask you to pay attention to the warnings indicated on the battery.There is a risk of fire and burns if used improperly or carelessly. You are not allowed to take the batteries apart, crush them, heat them above 60°C or burn them.You must follow the handling warnings in this manual to ensure that the battery operates safely. Do not jump-start a lead-acid battery as this may short-circuit the battery, causing damage to the battery. Only use a suitable charger for charging, for more information see www.GS-Power.net. This battery must not suffer any external damage. If you notice any external damage, please do not use the battery.

Never short-circuit the battery contacts (plus to minus).

Do not connect the power cables in reverse (polarity).

Do not operate the LiFePO4 battery beyond the maximum specifications given in the data sheet

2.2. Intended use

For our models with a BMS (Battery Management System), it is not necessary to use an external under- and overvoltage protection, as this is taken over by the BMS. The batteries with BMS also switch off automatically in the event of overheating. Do not connect several LiFePO4 batteries in series or parallel.

2.3. Glossary of terms

Life cycle length	The maximum service life of the product, if the guidelines set out in this guidelines set out in this operating manual
Charging cycle	The cycle from fully charged to fully discharged to fully charged again
CCCV	Constant Current - Constant Voltage
LiFeP04	Lithium-Eisenphosphat
DoD	Depth of Discharge (Entladungstiefe)

Table 1. glossary of terms

2.4. Symbols used

The following symbols are used throughout the manual:

 A warning indicates that serious damage to the user and/or product may occur if an operation is not performed as described.

 A warning sign indicates that problems may occur if an operation is not carried out as described. It can also serve as a reminder for the user.

3. Product specifications

3.1. Technical data

3.1.1. Electrical property

Label	GV-12V100Ah GV-12V100Ah smart GV-12V200Ah smart GV-24V100Ah smart
Capacity	100 Ah /200 Ah
Rated voltage	12,8 V / 25,6 V
Open-circuit voltage	13,5 V / 27 V
Self-discharge	< 10% each year

Tabelle 2. Elektrische Eigenschaften

3.1.2. Mechanical properties

Label	GV-12V100Ah GV-12V100Ah smart GV-12V200Ah smart GV-24V100Ah smart
IP protection	IP65
Chemistry	LiFePO4

Table 3. mechanical properties

3.1.3. Lade- und Entladeeigenschaften

Label	GV-12V100Ah GV-12V100Ah smart GV-12V200Ah smart GV-24V100Ah smart
Charging method	CCCV/IU
Charging voltage	10V–14,6V / 20V–29,2 V
Maximum charging current	50A
Final discharge voltage	14,6 V / 29,2 V
Discharge current continuous	150A / 100 A
Discharge pulse current (10sec)	450A / 300 A

Tabelle 4. Lade- und Entladeeigenschaften

3.1.4. Temperature properties

Label	GV-12V100Ah GV-12V100Ah smart GV-12V200Ah smart GV-24V100Ah smart
Charging temperature	0°C to 45°C
Discharging temperature	-20°C to 55°C
Storage temperature short term (<1 Month)	-20°C to 45°C
Storage temperature long term (>1 Month)	0°C to 25°C

Table 5. Temperature characteristics / Do not charge the Li-ion battery below 0 °C

3.1.5. Conformity data designation

Label	GV - Serie
Certifications	UN 38.3
Shipping classification	UN 3480

Tabel 6. Conformity data

3.2. Environmental conditions

The LiFePO4 battery may only be used under the conditions specified in these instructions. Exposing the LiFePO4 battery to conditions outside the specified limits may result in serious damage to the product and/or the user.

Use the LiFePO4 battery in a dry, clean, dust-free and well-ventilated area. Do not expose the LiFePO4 battery to fire, water, solvents or excessive heat.

3.3. Optional small chargers

Label	Charging capacity
Victron Blue Smart IP67 Ladegerät 12/7	7A
Victron Blue Smart IP67 Ladegerät 12/17	17A
Victron Blue Smart IP67 Ladegerät 12/25	25A

Table 7. optional small 12V chargers, for more options please email "info@gs-power.net"

4. Installation

4.1. General information

Never install or use a damaged battery.


Do not short-circuit the battery.


Only use battery-specific voltages together.


Do not install the GV series in series.


Do not connect the power cables in reverse polarity

4.2. Unpacking

Check the LiFePO4 battery for damage after unpacking. If the Li-ion battery is damaged, contact your specialist dealer or GS-Power. Do not install or use the LiFePO4 battery if it is damaged!

4.3. Commissioning the battery


Do not overcharge the LiFePO4 battery.


Always stay within the limits specified in chapter 2 while using the LiFePO4 battery.


Do not operate the LiFePO4 battery beyond the published maximum specifications.

4.3.1. Battery placement

Before use, the LiFePO4 battery must be positioned so that it does not move during use, but is firmly connected when used in dynamic situations.

Use suitable supports (brackets or wide straps) for mounting.

4.3.2. Connection cable

Use the appropriate cable for the connections to avoid overheating or unnecessary losses. It is better to use cables that are too thick.

Screw the cable connections or GS-Power copper bars tightly (M8), a loose cable leads to high heat development.

4.4. Connecting a charger to the battery

Make sure you have completed all the steps previously described in chapter 4 before connecting the battery to the charger.

4.5. Disconnecting a battery

- First disconnect the negative cable from the negative (-) terminal of the battery.
- Disconnect the positive cable from the positive (+) terminal of the battery.

General information

Follow the safety guidelines and measures in chapter 1.

Never overcharge the LiFePO4 battery, as this will permanently damage the battery; only use a class 2 LiFePO4-capable charger. See, among other things, at: *"www.gs-power.net"*

Before use, charge each LiFePO4 battery individually.

Disconnect the charger from the battery if it will not be used for a long time.

- **Connect the charger according to the description.**
- **Charge the battery in case of disconnection due to undervoltage or when the charge status drops below 20% to maintain battery life.**

5. Use of the battery

5.1. Charging current

The LiFePO4 battery from GS-Power can be charged in about two hours (50A) depending on the charger.

When using more powerful chargers, do not exceed the maximum charging current of 50A. Otherwise, the service life will be reduced, especially for batteries with smaller capacity.

This does not apply to larger battery banks connected in parallel.

6. Inspection and cleaning

6.1. General information

Never attempt to open or disassemble the LiFePO4 battery! The inside of the LiFePO4 battery does not contain any serviceable parts.

- Disconnect the LiFePO4 battery from all load and charging devices before carrying out cleaning and maintenance work.
- Place the enclosed protective caps on the positive pole before cleaning and maintenance work to prevent the poles from being touched.
- Protect the poles from conductive parts (spanners) to prevent short circuits.

6.2. Inspection

- Check the cables, copper bars and contacts for loose and/or damaged cables and contacts, cracks, deformations, leaks or damage of any kind. If any damage to the LiFePO4 battery is found, it must be checked by a professional. Do not attempt to charge or use a damaged battery. Do not touch any liquids (electrolysis) from a ruptured LiFePO4 battery.
- Consider replacing the LiFePO4 battery with a new one if you observe any of the following conditions:
- The runtime of the LiFePO4 battery drops below about 80% of the original runtime (> 3000 charge cycles at DOD 80%).
- The charging time of the LiFePO4 battery increases significantly.

6.3. Cleaning

If necessary, clean the LiFePO4 battery with a soft, dry cloth. Never use liquids, solvents or abrasive cleaners to clean the LiFePO4 battery.

7. Storage

Follow the storage instructions in this manual to optimise the life of the LiFePO4 battery during storage. If these instructions are not followed and the LiFePO4 battery is no longer charged when checked, consider it potentially damaged. Do not attempt to charge or use it. Contact your dealer or GS-Power.

The self-discharge of the LiFePO4 battery is approximately <10% per year.

- Charge or discharge the LiFePO4 battery to 75% of its capacity before storage.
- Disconnect the LiFePO4 battery from all loads and, if present, from the charger.
- During storage, place a terminal cap over the
- LiFePO4 battery terminals (+) during storage.
- Every year, charge the LiFePO4 battery to about 75 % of its capacity.

8. Transportation

Always check all applicable local, national and international regulations before transporting a lithium iron phosphate battery.

The transport of a discarded, damaged or recalled LiFePO4 battery may be specifically restricted or prohibited in certain cases.

The transport of the LiFePO4 battery falls under hazard class UN3480, Class 9. For transport by water, air and land, the LiFePO4 battery falls under packing group PI965.

9. Recycling and disposal

Always discharge the batteries before disposal. Use insulating tape or other acceptable covering on the battery terminals to avoid short circuits. Recycling of batteries for sustainability is mandatory. Dispose of the LiFePO4 battery in accordance with local, state and federal laws and regulations. Never throw the batteries in the household waste.

Batteries may be returned to the manufacturer.

10. Fault finding

Issue	possible situation	Lösung
Die Batterie kann nicht geladen werden.	The battery is not properly installed.	Check the installation of the battery.
	The cells in the battery are damaged or the battery is used up.	Contact your retailer.
The capacity of the battery has decreased.	The cells in the battery are damaged or the battery is used up.	Contact your retailer.

Tabelle 10. Fehlersuche

11. Warranty and liability

- The customer is obliged to check immediately upon delivery whether the products have been damaged during transport. In the event of such damage, the customer shall inform its dealer or GS-Power as soon as possible, but no later than three (3) days after delivery, by means of a precise written statement indicating the damage and, if possible, some photographs. Failure to inspect the products within the specified time and to inform the dealer (seller) or GS-Power of any defects will be considered as satisfactory delivery by GS-Power.

- In the event that the customer proves that any of the products supplied do not conform to the agreement, the dealer or GS-Power shall have the option of either repairing such products upon receipt, replacing them with new products or refunding the invoice value exclusive of shipping charges.

- GS-Power provides a five-year limited warranty against damage caused by manufacturing defects, commencing upon delivery. Damage caused by manufacturing defects does not include damage due to (a) general wear and tear, (b) short circuit, (c) overcharging, (d) deep discharge, (e) overheating of GS-Power products, (f) installation of the GS-Power product by persons who are not able to (g) any other improper use contrary to the operating instructions or the safety instructions of GS-Power, (h) any use contrary to the product specifications of this product, (i) any force majeure.

- The warranty period for parts of the Product repaired or replaced under warranty is twelve (12) months from the date of repair or delivery of replacement.

- Except as provided in the 3 above, GS-Power makes no warranty, express or implied, including, without limitation, any implied warranty of merchantability and fitness for a particular purpose or any warranty arising out of a course of dealing, course of performance or course of dealing usage.

  GS-Power specifically disclaims any representation or warranty that the product will meet the customer's requirements, perform any particular function, or achieve any desired result not expressly set forth in writing by GS-Power.

- Liability to the Customer shall in any event cease if the Customer fails to notify GS-Power in writing within ten (10) days of discovery of the defect so that GS-Power may investigate the damage.

- GS-Power's liability for damages incurred by the customer shall in any event be limited to the invoice amount of the products concerned. Unless these damages were caused by gross negligence or wilful misconduct on the part of GS-Power. GS-Power shall never be liable for (a) damages caused by any of the circumstances set forth in Chapter 11 resulting in damage to the GS-Power Products or any other equipment in the vicinity of such Products, or (b) consequential damages, including but not limited to lost profits, loss of production,

business interruption, loss of products and loss of capacity, regardless of the cause of such consequential damages, or (c) goodwill.

- To the extent that a court finds that the limitation of liability set forth in Chapter 11 cannot be applied against a particular claim for damages by the Customer, GS-Power's liability for property damage, financial loss and bodily injury (including death) caused by the use of these particular GS-Power Products shall in any event be limited to the amount actually paid out by GS-Power's insurance company to GS-Power pursuant to the coverage of this insurance policy for that particular type of loss. GS-Power has insured itself against certain risks. These policies contain a customary limitation on the insurance benefit payable to GS-Power if and to the extent the event is a Covered Event.

Power

www.gs-power.net

GS.net GmbH & Co KG
Bachstr.15
63762 Großostheim
Germany