PowerXtreme

Proud experts in LiFePO4 batteries!

User Guide

PowerXtreme X20 & X30

LiFePO4 Battery 12V 20 & 30 Ah

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Preface

This manual is intended for installers and users of the battery. Read and understand this manual carefully before installing, using or maintaining the battery. Only qualified personnel should install and maintain the battery. Improper use, other than as described in this manual, may lead to dangerous situations and will void the warranty. Keep this manual in a safe place near the battery, so it can be easily accessed in the future.

Target audience

This manual is intended for the individuals who install and/or use the battery.

Relevant documentation

The following documentation is available for the battery pack:

Document	Location
User Guide	This document
E04-X20-ENxx_MSDS Material Safety Data Sheet	See our website (www.emergoplus.com)
E04-X30-ENxx_MSDS Material Safety Data Sheet	

Used symbols

Safety information is indicated using various risk levels. Refer to the table for the meaning of the safety symbols in this manual:

Symbol	Meaning
⚠ DANGER	Indicates a situation that, if safety instructions are not followed, will result in serious injury or death
⚠ WARNING	Indicates a situation that, if safety instructions are not followed, could result in serious injury or death
⚠ CAUTION	Indicates a situation that, if safety instructions are not followed, could result in minor or moderate injury
NOTE	Indicates a situation that, if safety instructions are not followed, could result in battery damage

Other symbols in this manual are not related to safety. See the table for the meaning of the other symbols in this manual:

Symbol	Meaning
ⓘ **Tip!**	Information useful to some readers

1 Introduction

1.1 Intended Use

This battery is designed as a power source for a 12 VDC system. A maximum of 4 batteries of the same model can be connected in parallel.

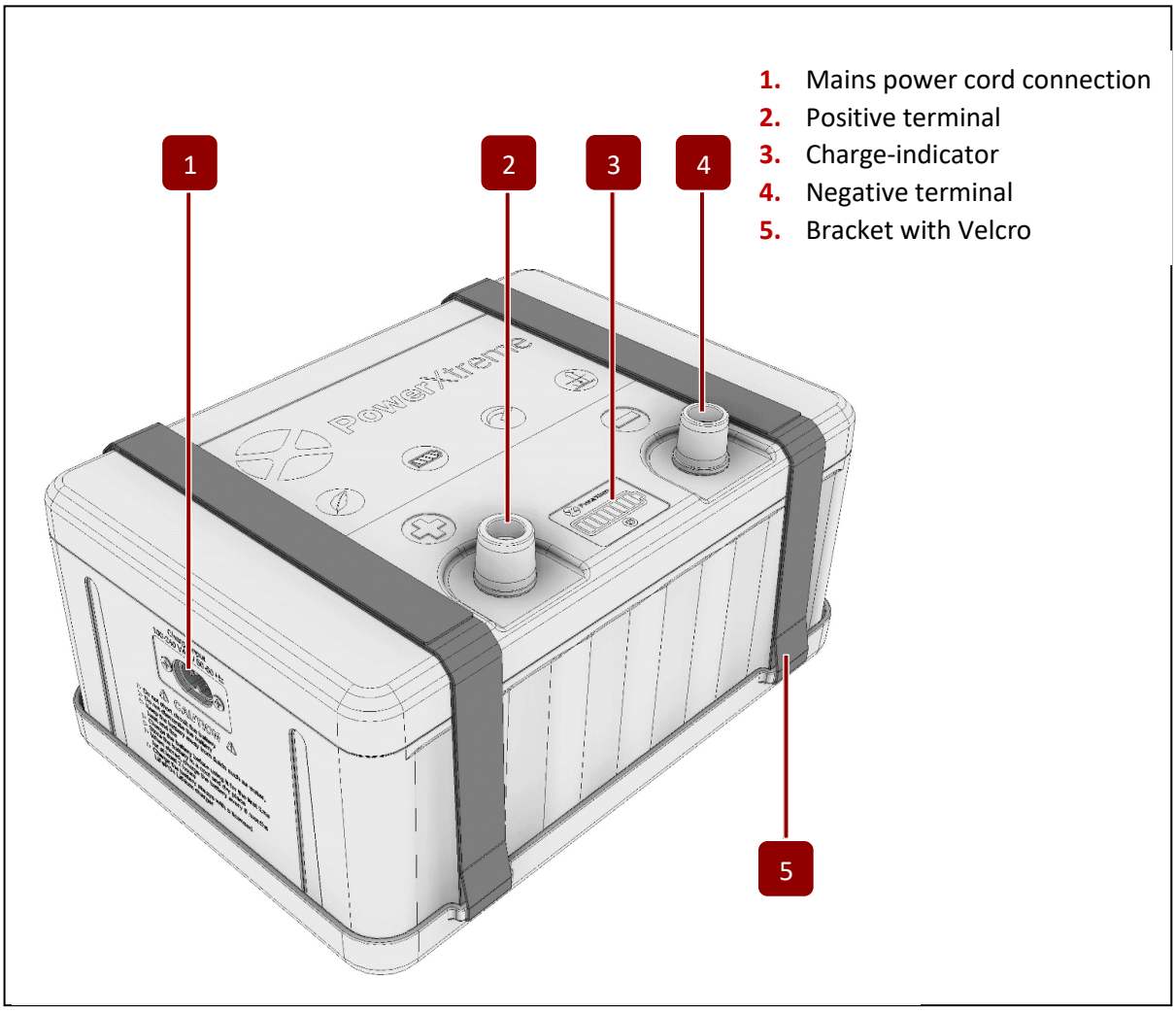
This battery is not intended as a starter battery.

Any use of the battery other than as described in this manual is considered unintended use and will void the warranty.

2 Product Description

The PowerXtreme X20 & X30 are lithium iron phosphate batteries, also known as LiFePO4 or LFP. These batteries are highly suitable for installation in vehicles or boats as domestic/auxiliary batteries, but they can also be used in a non-mounted setup. The batteries are easy to install and are protected by an integrated Battery Management System (BMS) against overcharging, overvoltage, undervoltage, temperature extremes, and short circuits.

2.1 Main Components



1. Mains power cord connection
2. Positive terminal
3. Charge-indicator
4. Negative terminal
5. Bracket with Velcro

2.2 Key Specifications

General			
Model		PowerXtreme X20	PowerXtreme X30
Cell chemistry		LiFePO4 (Lithium Iron Phosphate)	LiFePO4 (Lithium Iron Phosphate)
Lifespan		Minimum 2000 charge cycles (at 80% DoD)	Minimum 2000 charge cycles (at 80% DoD)
Dimensions		255x177x115 mm	255x177x115 mm
Weight		3,8 kg	5,0 kg
Connection		Poles with M6 female thread	Poles with M6 female thread
IP rating		IP 62	IP 62

Input (Charging)			
Charging voltage		14,4 - 14,6 V	14,4 - 14,6 V
Charging method		CC-CV	CC-CV
Internal charger	Input voltage	100 – 240 VAC	100 – 240 VAC
	Input frequency	50 – 60 Hz	50 – 60 Hz
	Charging current	4 A	4 A
External charger	Max. charging current	35A (Via battery terminals)	55A (Via battery terminals)

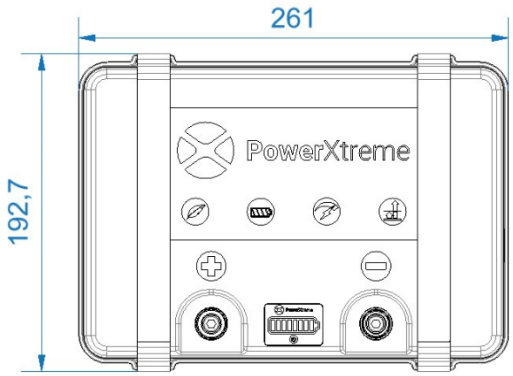
Output (discharging)		
Nominal voltage	12,8 V	12,8 V
End of discharge voltage	10,5 V	10,5 V
Capacity	20 Ah / 256 Wh	30 Ah/ 384 Wh
Nominal continuous current	100 A / 1200 W	150 A / 1800 W
Short-term current (max. 30 sec.)	< 150 A	< 200 A
Peak current (max. 1 sec.)	< 200 A	< 300 A

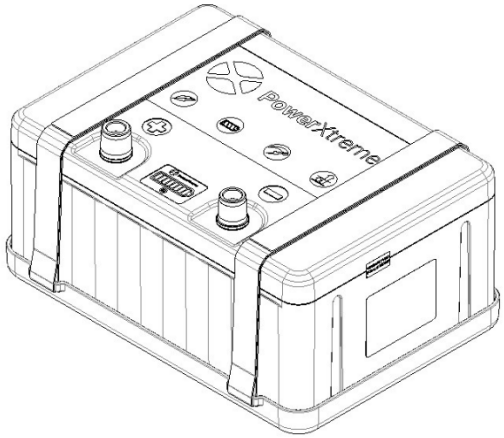
Battery temperature specifications	
Charge temperature	0 – 45 °C
Discharge temperature	-20 – 60 °C
Storage temperature	-10 – 45 °C

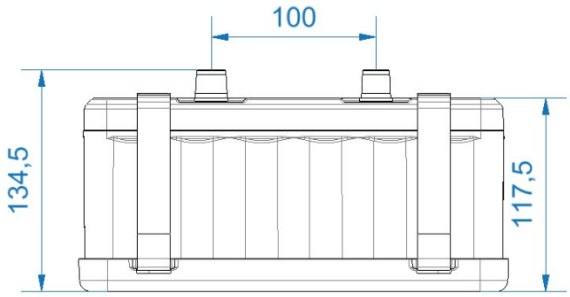
If the battery temperature is outside the specified limits, the battery will not charge or discharge.

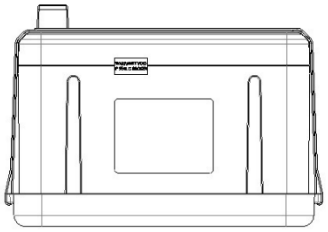
Safety and certification	
Internal security	Overcurrent
	Overvoltage and undervoltage
	Short circuit
	Protected against over- and under-temperature
Certification PowerXtreme X20	UN38.3/ MSDS/ CE
Certification PowerXtreme X30	UN38.3/ MSDS/ CE/ UN ECE R10.06

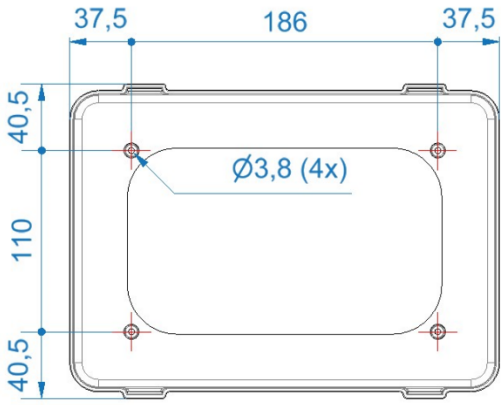
2.3 Dimensions

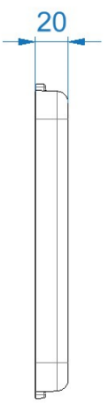












3 Safety

3.1 Safety Features

The following safety features have been incorporated into the design of the battery:

- The **integrated battery management system** (BMS) protects the battery against overload, overvoltage, undervoltage and short circuit. In addition, The battery automatically switches off if the temperature is outside the operating range.

3.2 Safety Symbols on the Battery

The following safety symbols are visible on the battery:

Symbol	Meaning
	Do not use near an open flame.

3.3 Safety Instructions

⚠ DANGER

Explosion danger! When connecting or disconnecting the battery, sparks may occur, which can ignite flammable substances.

Never use the battery in the presence of flammable gases or substances.

⚠ WARNING

The battery can deliver high currents, posing a risk of electric shock:

- Pay attention to polarity when connecting the cables. Never connect the cables to the wrong terminal.
- Never touch both battery terminals at the same time.
- Prevent unintended contact between conductive objects and the terminals.
- Do not submerge the battery in water or any other liquid.
- Keep the battery away from children and animals.
- When installing the battery in parallel, only combine batteries of the same model and capacity.

⚠ WARNING

The electrolyte in the cells is highly corrosive. In case of damage or improper use, the battery may leak. A leaking battery can cause injuries and is harmful to the environment:

- Avoid damage to the battery housing.
- Do not expose the battery to aggressive chemicals.
- Do not use the battery if it is damaged or defective.
- Do not disassemble or shred the battery when disposing it.
- Do not expose the battery to temperatures higher than 65°C or fire.
- Never touch the electrolyte.
- If you come into contact with the electrolyte, rinse thoroughly with plenty of water and seek medical attention.

NOTE

Risk of damage to the battery. Saltwater causes corrosion on the terminals:

- Do not expose the battery to saltwater or other corrosive liquids.

NOTE

Risk of damage to the battery. Incorrect use can cause damage to the battery..

- Do not use the battery as a starter battery.
- Never connect the battery in parallel with a different type of battery, such as directly to the wiring from a vehicle. Always use a charging system for this purpose.

NOTE

Risk of damage due to overheating:

- Keep the battery away from dust and dirt, and place it in a well-ventilated area. Never cover the battery with clothing or other flammable materials.
- Do not place the battery in the engine compartment or any other location where the temperature may rise significantly.

NOTE

Incorrect use can result in a shorter lifespan of the battery:

- Do not leave the battery connected to the charger for an extended period when it is already fully charged.
- Check that everything is turned off before storing the battery.

4 Storage and Transport

4.1 Storage

Only remove the battery from its original packaging when you need it. If you are storing a (used) battery for an extended period (such as during winter storage), store it as follows:

1. If the battery is installed in a vehicle or vessel, it can remain in place.
2. Charge the battery to at least 80% (see section 6.1).
3. Ensure that the battery does not discharge during storage. This can be done in one of the following ways:
    - Disconnect all wiring from one terminal:
    - If available, turn off the main switch:
    - Place the battery in storage mode* (see chapter 6.3.1).
4. Ensure that the environment around the battery meets the following conditions:
    - Clean and dry.
    - Temperature between -10 – 45 °C.
    - Humidity < 80% (non-condensing).
5. Charge the battery to at least 80% every six months to keep the battery in optimal condition.

*Ensure that the battery is not charged during storage, for example by solar panels, as this will cause the battery to exit storage mode.

NOTE

Risk of damage to the battery. If the battery remains in a discharged state for an extended period, it may suffer irreversible damage. The battery is protected against undervoltage; however, if stored empty, it can become deeply discharged due to self-discharge. The self-discharge rate is approximately 4% per month for the X20 and about 3% for the X30.

4.2 Transport

⚠ WARNING

The battery is heavy and can become a projectile in the event of a collision if not properly secured. During transport, the battery must always be securely fastened so that it cannot move. If possible, transport the battery in its original packaging. Use fastening materials and ensure that the battery does not come into contact with other objects to prevent damage or injury. Transport is defined here as the act of moving the battery from one location to another, other than when the battery is in use.

NOTE

Risk of legal violation. Some regulations may impose restrictions on the transportation of this battery:

- Always check the locally applicable regulations.
- Check for any additional regulations when transporting a damaged battery.

The transportation of a lithium battery falls under hazard class UN3480, class 9, and packaging class P965, Chapter II.

5 Installation

5.1 General

The following is important for the installation:

⚠ WARNING

Always use the correct wiring with sufficient cross-section and properly sized cable lugs or battery clamps (to ensure no overheating or unnecessary losses occur). Always use the proper crimping tools to attach the cable lugs and follow the instructions from the cable lug manufacturer.

⚠ WARNING

Fire hazard! If the contacts are not properly secured to the terminals, this may cause sparks or the terminals may become very hot. Always tighten the contacts (M6 bolts) securely to the terminals. We recommend using a torque wrench (M6, 10 Nm).

⚠ WARNING

Never install batteries in series.

NOTE

Risk of short circuit. If the battery is directly connected to a starter battery and alternator, high currents may flow through the battery and wiring, potentially causing the wiring to melt or a fire. Always use a charge booster when charging the battery via the starter battery and alternator.

NOTE

The bolt length depends on the quantity and thickness of the cable lugs. To ensure a proper connection, the bolt must be screwed in at least 5mm into the terminal. The bolt should not be screwed more than 10mm into the battery terminal. A bolt that is too long can cause irreversible damage.

NOTE

We recommend using electrogalvanized (ELVZ) M6 bolts if the supplied terminals are not used.

NOTE

There is a difference in the diameter of the (supplied) positive and negative terminals (positive = thick, negative = thin).

ⓘ Tip! Use a red cable for the positive (+) and a black cable for the negative (-).

ⓘ Tip! Install a fuse and a main switch in the power circuit in accordance with local regulations. Place the fuse as close as possible to the positive terminal of the battery.

ⓘ Tip! Enable storage mode when installing the battery.

5.2 Installation location

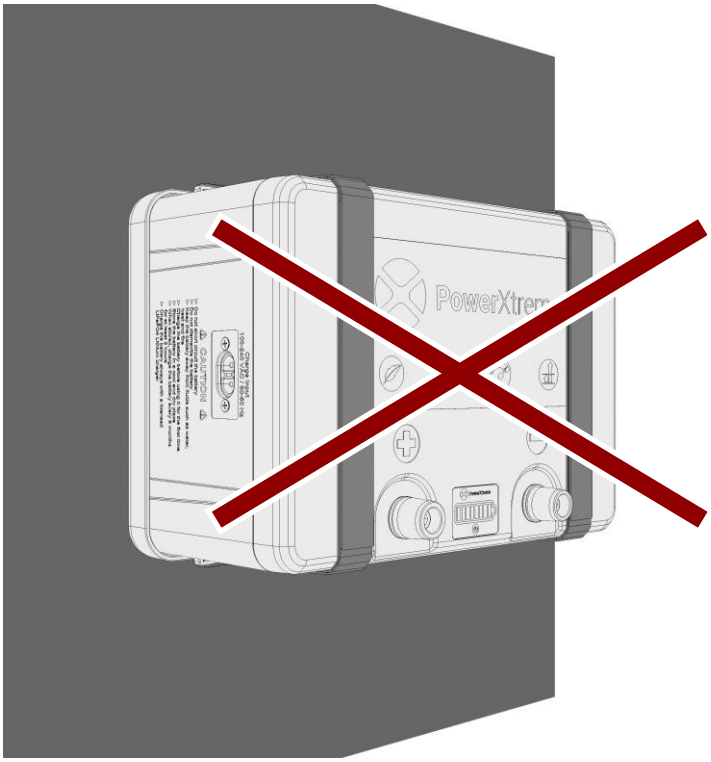
The installation location must meet the following requirements:

- Shielded from weather conditions.
- Sufficient ventilation for the battery.

NOTE

Do not install the battery with the poles facing down. The position shown in the image below is the only position where the battery should not be installed.

ⓘ Tip! Keep a 10 cm clearance around the battery for optimal ventilation.



5.3 Contents of the Package

Check that all components are undamaged and present in the packaging. Refer to the table below for the contents.

Quantity	Part
1×	Battery
1×	Battery terminals (+ and -) with 2 mounting bolts
1×	Mounting bracket with Velcro
1×	4 screws for mounting bracket
1×	Interior sticker
1×	Power cord for charger

Report missing or damaged parts to your supplier.

5.4 Fixing

⚠ WARNING

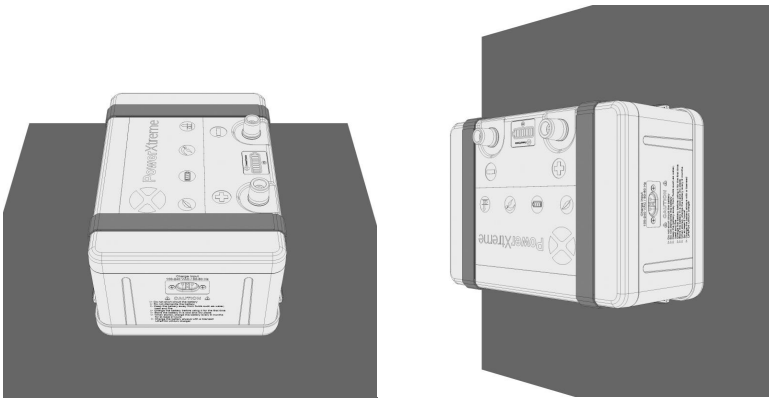
Risk of a dangerous situation! The battery can become a projectile in the event of an accident if it is not securely fastened. Always secure the battery when installing it in a vehicle.

The battery can be used either free-standing or fixed. If you do not wish to fix the battery, you may skip this section.

The surface on which you want to fix the battery must be strong enough to support its weight.

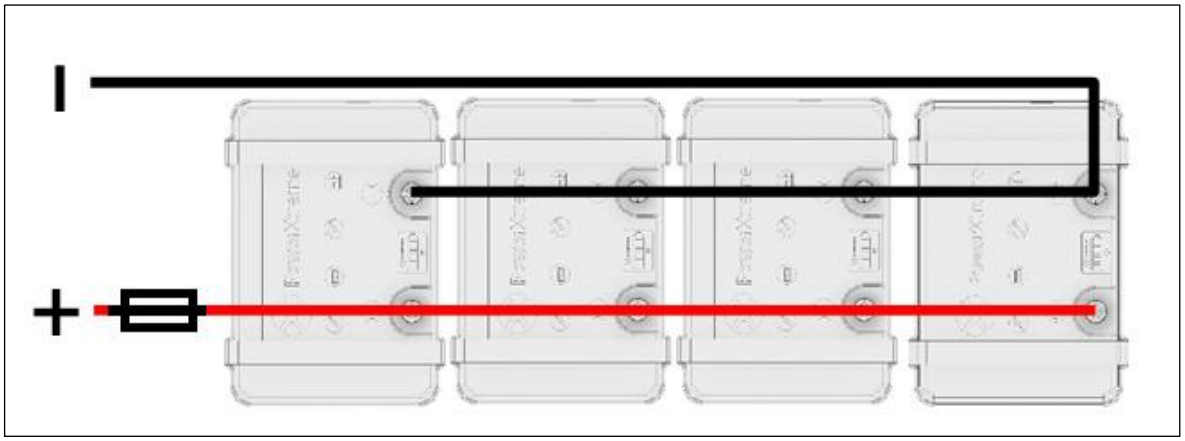
Secure the battery as follows:

1. Attach the bracket at the desired location. Use a mounting method suitable for the weight of the battery and the surface on which the battery is being installed.
2. Place the battery in the bracket and secure it with the Velcro strap.



5.5 Parallel Connection

To increase capacity, up to 4 batteries of the same model can be connected in parallel. Ensure that the voltage of the batteries is equal when connecting them (maximum difference of 0.5 V). If you wish to connect more than 4 batteries in parallel, please contact the supplier. The following illustration shows how the batteries should be connected in parallel.



NOTE
When connecting batteries in parallel, an external fuse must always be installed in the outgoing wiring. The fuse size depends on the specific application.

NOTE
When batteries are used in parallel, the wiring must be sized and specified according to the maximum current the parallel bank can deliver.

5.6 Charging Test after Installation

To verify that the battery and charger are correctly installed, it is important to perform several charging tests after installation. Fully charge the battery using the designated charger; the battery should reach a voltage between 14.4 and 14.6 volts and then enter Standby mode. This will be visible in the status overview of the app. Afterward, perform the same test using the booster and the solar panels. If the battery does not fully charge during any of these tests, it may indicate an incorrect setting in the installation.

6 Use

⚠ WARNING
Risk of electric shock! A battery can carry a large current:
- Never touch a terminal of a battery while it is connected.
- Never touch both terminals of a battery at the same time.

⚠ WARNING
Risk of injury! Using a damaged battery poses a danger to your health:
- Never use a damaged battery.
- Never touch any liquid that leaks from the battery.

6.1 Charging the Battery

You can use the supplied power cord to charge the battery. The procedure is as follows:

1. Insert the power cord into the battery's connection port.
2. Plug the power cord into the electrical outlet.

If you want to charge the battery with an external charger, you will need a battery charger. The shore power charger (booster and solar panels) must meet the following requirements:

- Suitable for LiFePO4 lithium batteries.
  - Charging voltage of at least 14.4 V and up to a maximum of 14.6 V.
  - Equipped with a restart charging function (pulse function).
  - CC-CV charging characteristic.
  - Stops charging when the battery is fully charged.

NOTE
If an external charger is installed, we recommend always connecting the internal charger as well.

ⓘ Tip! Do not keep the battery connected to shore power for more than 1 month.

NOTE
The battery will not start charging if the battery temperature is below 0 °C. (The battery is protected against this.)

NOTE
Risk of high currents. If you connect the battery directly to a starter battery and alternator, high currents may flow to and from the battery. Always use a charge booster when charging the battery via the starter battery and alternator.

To charge the battery with an external charger, follow these steps:

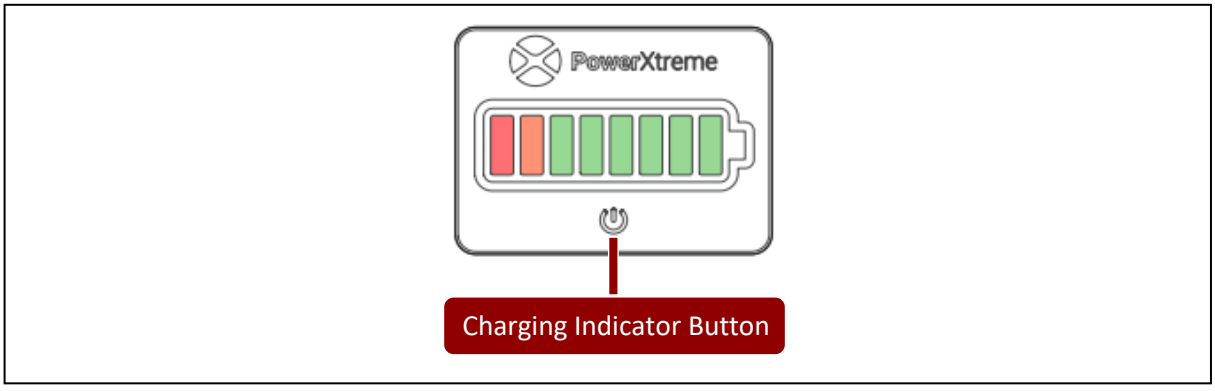
1. Connect the positive terminal of the charger to the positive terminal of the battery.
2. Connect the negative terminal of the charger to the negative terminal of the battery.
3. Connect the charger to the mains power by plugging it into an electrical outlet or connecting it to an integrated onboard system.

The battery can also be charged using solar panels. Follow the instructions in the solar panel user manual. Ensure that the charger used is suitable for lithium batteries.

ⓘ Tip! The XS20s MPPT solar charger with solar panels from our product range is a highly suitable solar charger for this battery.

ⓘ Tip! The battery can also be charged during long drives. The PowerXCharger XC3 is available as an optional charger for this purpose. Please follow the instructions in the XC3 user manual.

6.2 Explanation of the Charging Indicator

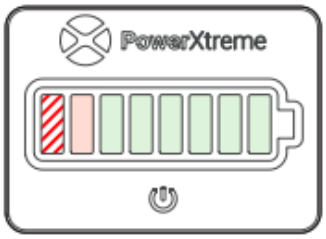


Use the charging indicator as follows:

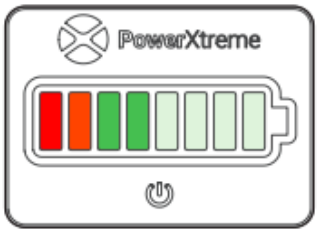
1. Press the button on the charging indicator to check the battery status.
   * This button cannot be used to turn the battery on or off.

The battery status can be read as follows (after pressing the button):

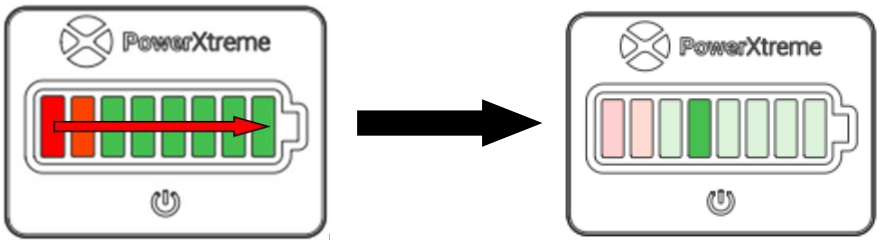
- If the red LED is flashing, the battery capacity is below 5%.



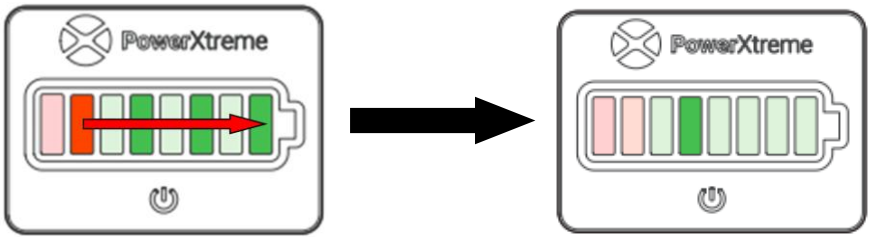
- If the battery is not connected to a charger, the LEDs will light up to the LED indicating the current charge level.



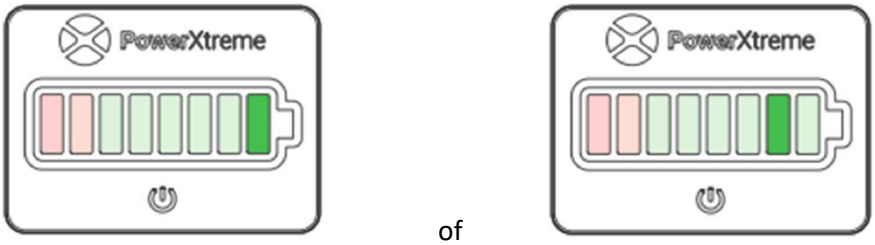
- If the battery is connected to a charger but not connected to the app, the indicator will light up fully and then briefly display the current charge level.



- If the battery is connected to a charger and also connected to the app, the indicator will light up fully and then briefly display the current charge level.



- When the battery is connected to the charger and fully charged, the last LED will be lit. If the battery is still balancing, the second-to-last LED will be lit.



6.3 PowerXtreme Pro App

In the PowerXtreme Pro app, you can check the status of your battery on your phone or tablet.

PowerXtreme PRO

www.powerxtreme.eu/powerxtremeproapp

Use the app as follows:

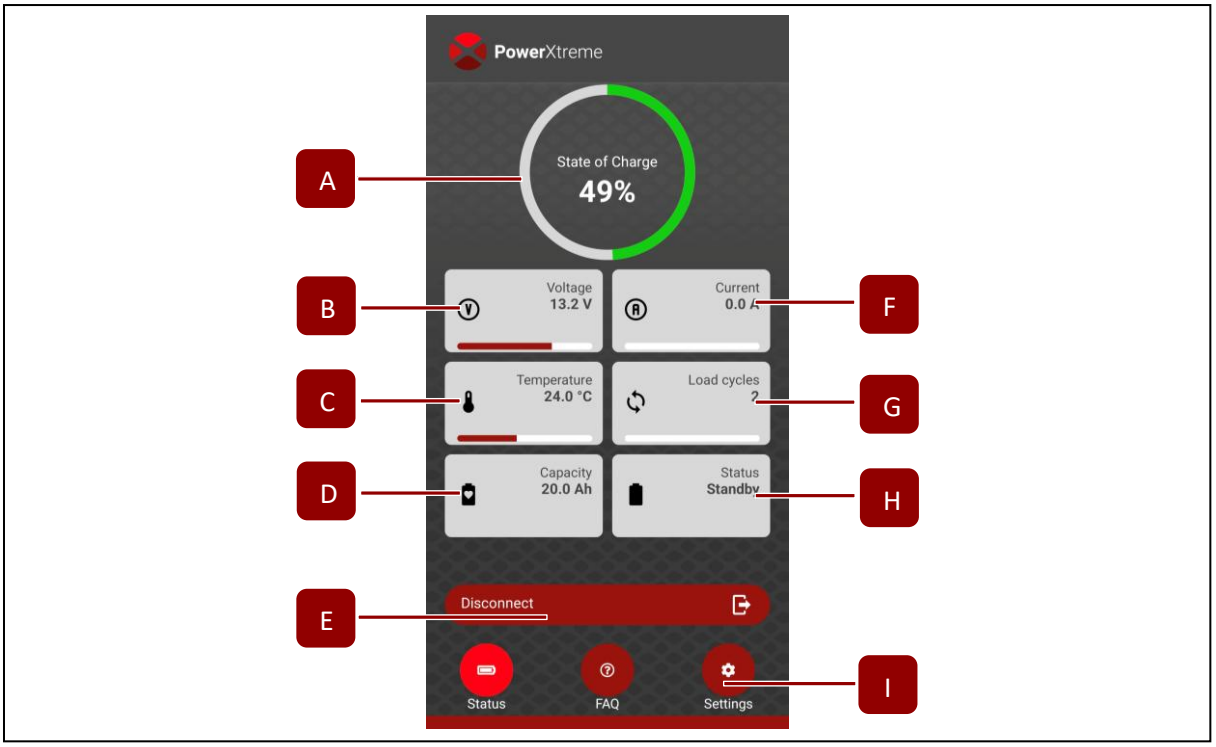
1. Download the app from the App Store or Play Store onto your device.
2. Turn on Bluetooth on your device.
3. On an Android device, enable location services.
4. Open the app.
5. If necessary, grant the app permission to use Bluetooth.

The main screen of the app will appear, displaying a list of all Bluetooth devices within 5 meters of your device.

6. Look for a name in the list with the following format: “EM**********”.
7. Select your battery.

6.3.1 Status

The battery summary appears.

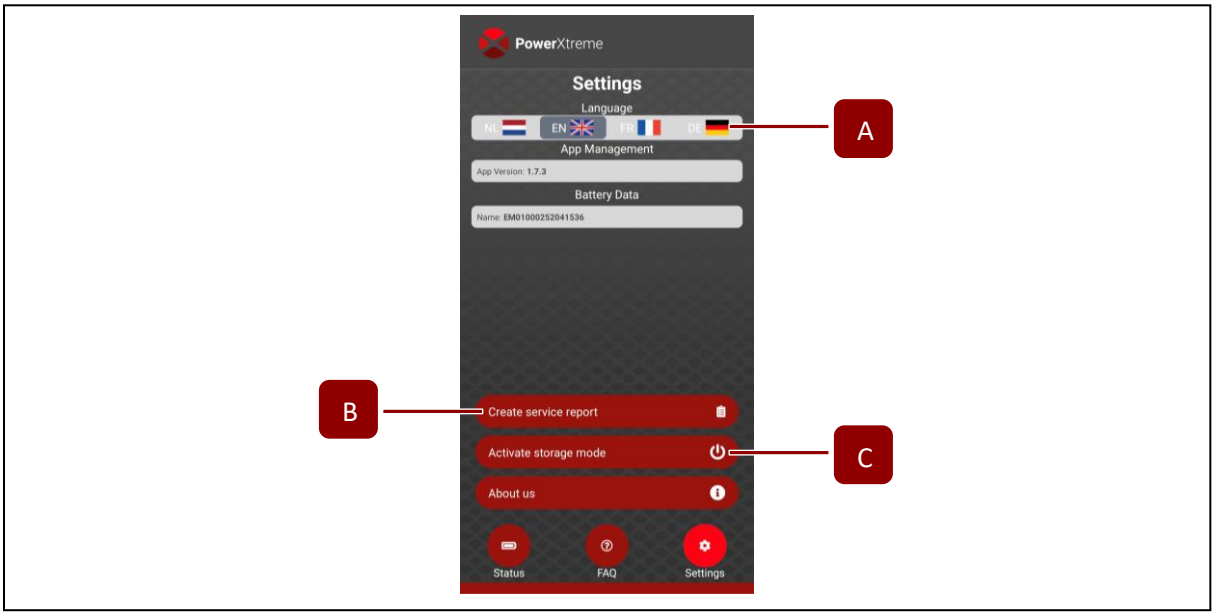


	Data	Meaning		
A	State of Charge	The current charge level of the battery.		
B	Voltage	Battery voltage.		
C	Temperature	Current temperature of the battery.		
D	Capacity	Current capacity of the battery.		
E	Disconnect	The button to disconnect the Bluetooth connection between the device and the battery.		
F	Current	Current through the battery (red = discharging, green = charging).		
G	Load cycles	Number of charge/discharge cycles.		
H	Status	Status of the battery	Standby	Battery is ready to use.
			Charging	The battery is charging.
			Discharging	Power is being drawn from the battery.
			Save mode	The battery is in save mode.
			Short circuit	A short circuit has occurred in the battery pack (chapter 8).
			Too cold to charge	Battery temperature is too low to start charging.
			Too cold to discharge	The battery temperature is too low to supply power.
I	Settings button	Settings of your battery (see chapter 6.3.2).		

6.3.2 Settings

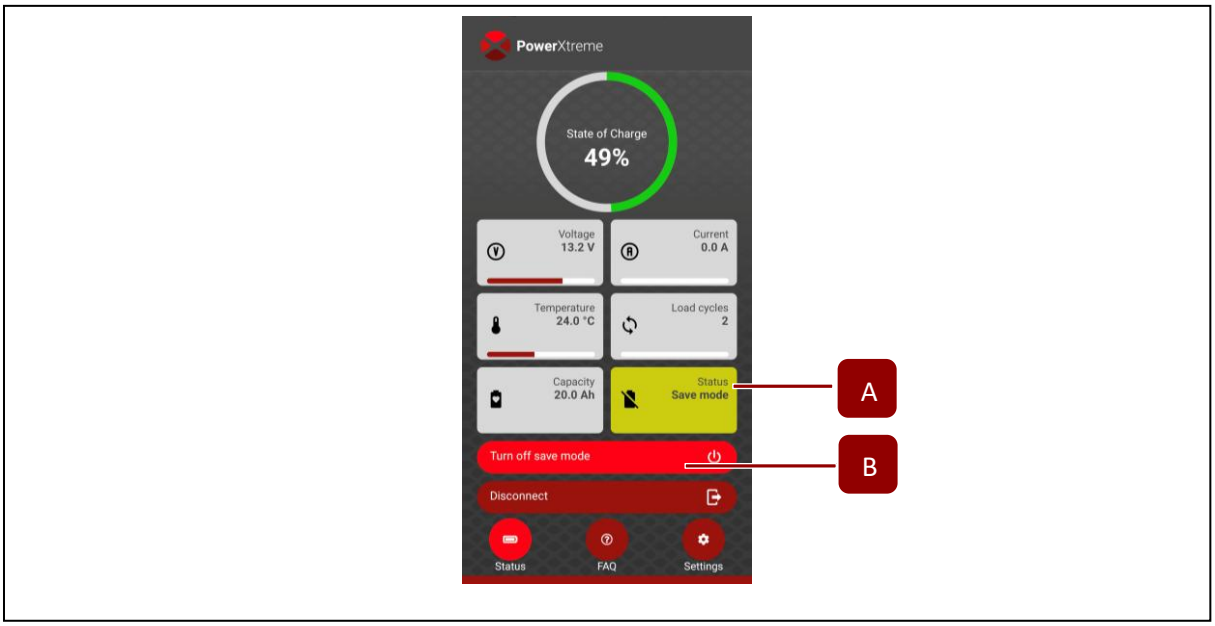
Change the settings as follows:

- Press Settings in the battery overview.



	Data	Meaning
A	Language	Change the language of the app
B	Create service report	If necessary, a service report can be created
C	Activate save mode	Turning save mode on or off

6.3.3 Save mode

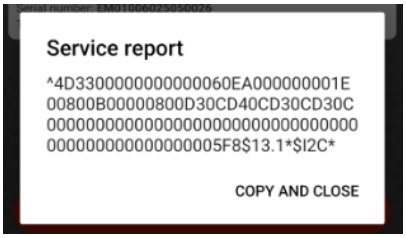


	Data	Meaning
A	Status	The status indicates that the battery is in save mode
B	Turn off mode	The battery can be taken out of save mode

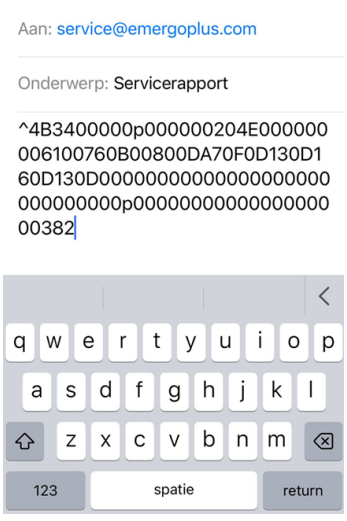
6.3.4 Create service report

ⓘ Tip! For the most accurate service report, it is best to create it shortly after the battery is fully charged. The battery is considered sufficiently charged when the voltage displayed in the app is at least 14.4 V.

- After clicking the 'Create Service Report' button, this screen will appear. Copy the code by clicking 'Copy and Close'.



- Create a new email and paste the code into the email. Send this email to service@emergoplus.com. Also include the following in the email: serial number, description of the issue, and a screenshot of the battery overview in the app showing the charge level and voltage.



7 Maintenance, Inspection and Cleaning

7.1 Maintenance

The battery does not require special maintenance; it is maintenance-free but must be charged to at least 80% every six months.

7.2 Inspection

Check the wiring and connections at least once a year. Immediately address any issues such as loose connections, melted cable insulation, or burned cables.

The battery should be replaced with a new one, if you find that the capacity has declined to the point where it causes issues. This could be the result of a defect that can be repaired. To verify this, you can send a service report to the manufacturer.

⚠ WARNING
Never touch the liquid (electrolyte) from a damaged battery.

7.3 Cleaning

If necessary, clean the battery with a damp cloth.

NOTE
Do not make contact with the battery terminals. If necessary, disconnect the cables.

NOTE
Never use solvents or abrasive materials to clean the battery.

8 Malfunction

This table provides an overview of solutions for potential issues with the battery. If you cannot resolve the issue using this manual, please contact your supplier. Be sure to have the following information ready: the specific model of the battery, the quantity, the serial number, the supplier, the purchase date and a copy of the original invoice.

Problem	Possible cause	Possible solution
The battery does not discharge and there is no voltage on the terminals	The battery is in storage mode	Take the battery out of storage mode (see section 6.3.1)
	The battery is too low (< 5%)	Charge the battery (see section 6.1)
	Battery temperature is below -20 °C or above 60 °C	Keep the battery between -20°C and 60°C
	The app indicates a short circuit or overload	Resolve overload or short circuit and briefly connect a charger
The battery does not charge	The battery temperature is below 0 °C or above 45 °C	Keep the battery between 0°C and 45°C
	The power cord has no voltage	Ensure the power cord is connected to a power source

Charger connected with 220V power cord, red and orange LED is flashing	Internal charger faulty	Contact your supplier
There is no voltage on the terminals and the orange LED is flashing	The battery is in storage mode	Take the battery out of storage mode (see section 6.3.1)
The charge indicator shows nothing when pressing the button	The battery is completely discharged – Risk of irreversible damage	Charge the battery (see section 6.1) and eliminate standby power consumption*
The battery is not visible in the app or connection fails	The battery is completely empty – Risk of irreparable damage	Charge the battery (see section 6.1) and eliminate standby power consumption*
	The battery is out of range of your device	Ensure the battery is within 5 meters of your device
	The Bluetooth on your device is turned off	Turn on Bluetooth on your device
	Another device is connected to the battery	Disconnect the connection on the connected device

*Standby power consumption is the energy used by systems or devices that continuously draw a minimal current, even when the camper is not in use. This includes, for example, the consumption of the inverter, solar charge controllers, or other devices in standby mode. This consumption can slowly drain the battery.

If the battery shuts down due to a short circuit, the cause must be eliminated. Afterwards, connecting the charger to the mains will reactivate the battery.

If the battery is overloaded 5 times, the charger must be connected to be able to use the battery again.

9 Warranty and Liability

EmergoPlus B.V. guarantees that the PowerXtreme X20 & X30 are built in accordance with the applicable legal standards and regulations. During production and before delivery, all batteries are thoroughly tested and inspected. If you do not act in accordance with the instructions and provisions of this manual, damage may occur and/or the unit may not meet our specifications. This may void the warranty. The standard warranty period is 2 years. If you register your battery with us within six months of purchase (via the website https://emergoplus.com/registreren/), we will extend the warranty period to 5 years.

9.1 Warranty Period

EmergoPlus B.V. guarantees, within the 5-year warranty period (*after registration within six months of purchase), that the product is free from material and manufacturing defects under normal use, provided that the installation and maintenance instructions have been followed and the product has been stored properly (storage meaning the condition in which the product is not being used for its intended purpose). The warranty period begins on the date of purchase (invoice date). This warranty is not transferable in the event of resale.

9.2 Exclusions

This warranty does not cover: (a) wear, corrosion, discoloration, and aging resulting from normal use and proper storage; (b) damage caused by incorrect and/or improper maintenance; (c) damage to the product caused by external factors such as fire, immersion in water, vapor, liquids, ice, improper use, dropping, neglect, misuse (including use contrary to the instructions provided by EmergoPlus B.V.), or abuse.

9.3 Warranty Claims

To make a warranty claim, you must notify the point of sale where you purchased the product of the defect within a reasonable period after discovering it, but in any case before the warranty period expires. You may also contact the headquarters of EmergoPlus B.V. When making a warranty claim, the product (or the defective part) and the warranty certificate obtained upon registration, or the original purchase receipt, must be presented.

- The warranty becomes void if the instructions in this manual are not followed or if repairs are carried out without authorization.
- The battery must not be opened. The warranty is void if the battery has been opened and the warranty seal is broken.
- The customer is responsible for the cost of return shipping.
- Defective batteries received within the warranty period and covered by the warranty will be repaired or replaced and returned to the customer free of charge.

EmergoPlus B.V. cannot be held liable for:

- Damage resulting from the use of the battery.
- Possible errors in the provided manual and any resulting consequences.
- Use that is incompatible with the intended purpose of the product.

The information in this document is subject to change without notice. EmergoPlus B.V. is not liable for technical errors or omissions in this document. The purchased product may differ from the product described in this manual.

EmergoPlus B.V.'s liability is limited to the cost of repair and/or replacement of the product under warranty. The battery must be returned to EmergoPlus B.V. In case of product replacement, the warranty period starts from the date of purchase of the original product. EmergoPlus B.V. is not liable for loss of profits, consequential damages, indirect damages, or other special forms of damage. This warranty does not affect your statutory consumer rights and is only valid and legally enforceable in the country where the product was purchased.

10 Disposal

⚠ WARNING

Risk of injury. The battery contains substances harmful to human health. Do not dismantle or shred the battery during disposal.

⚠ WARNING

Failure to follow the instructions in this manual may result in injury or product damage. Ensure that this manual, a copy, or reference is provided if reselling the battery.

If the battery is defective, first contact your supplier. It may still be repairable.

If you need to dispose of the battery, please do so as follows:

1. If not defective, discharge it as much as possible.
2. Insulate the terminals with electrical tape or other protective material.

ⓘ Tip! You can also return a defective battery to your supplier or a certified recycling facility for proper disposal. Contact your supplier for specific conditions and costs.

NOTE

This is a lithium battery and improper disposal may harm the environment. Do not dispose of the battery with household waste.

3. Dispose of the battery in accordance with local and national regulations.

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PowerXtreme