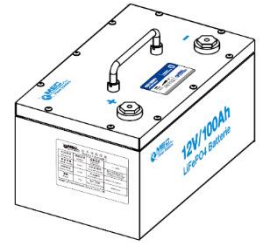


# Instruction Manual

## LiFePO4 Battery Packs

### 12V/100Ah Series:

IP65 battery pack is equipped with a smart battery management system (BMS) to ensure stable and highly efficient charge and discharge performance. It can be charged by a lithium-based battery charger. LiFePO4 is one of the safest Li-ions, recognized with the outstanding electrochemical performance and durability.



## Safety Rules and General Warnings

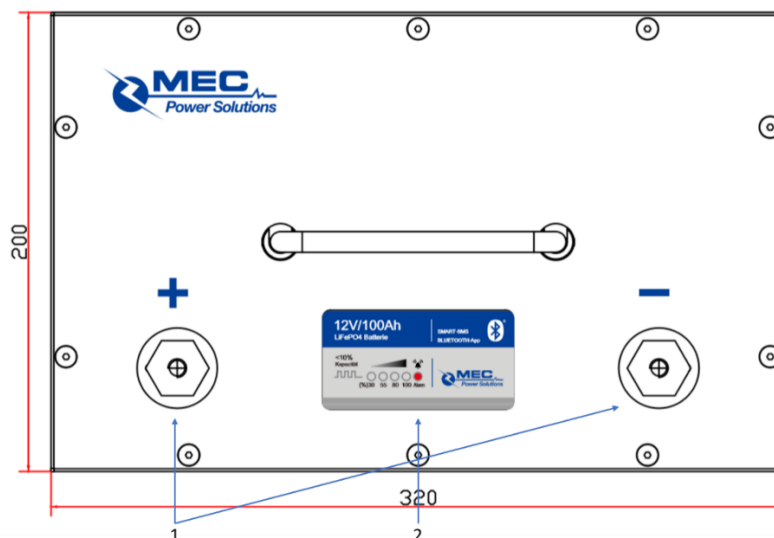
- Persons, who are not able to use the battery pack in a safe way, because of their physical, sensory or mental incompetence, or because of their lack of experience, should not use without the control or instruction from a skilled or qualified person.
- The battery pack is not suitable for children – Danger of Life.
- Beware of risks of getting the electric shock all the time.
- Stay away from flammable gases, solvents or vapours all the time. Ensure sufficient air and avoid open flame or sparks. Never incinerate the battery pack. Explosion RISK!
- Follow strictly the charge and discharge instructions and use only chargers with the appropriate specifications / charge profiles to charge the battery pack.
- Make sure the screws at the charge / discharge terminals are always tightened. Screw drivers used for tightening the screws must be well electrically insulated.
- Make sure the positive and negative terminals are well electrically insulated before use.
- DO NOT OPEN or DISMANTLE the battery pack. Repair work or cell replacement must only be performed by authorized technical staff.
- Disassembling the battery pack may cause short circuit within the cells, which may further lead to fire, release of harmful gases, electrolyte leakage or even explosion.
- In case of any obvious damages such as deformed enclosure, electrolyte leakage or the presence of any unpleasant smell, the battery pack must not be used. Disconnect from the charger and the load immediately.
- DO NOT TOUCH the electrolyte. It is harmful. If the electrolyte splashes into your eyes or on your skin, flush your eyes or skin with cold water immediately and consult the doctor.
- The battery pack should be protected against direct sun light, solar radiation or temperatures over 40°C.
- Store the battery pack in dry room (rel. humidity <80%). Clean with dry cloth only. Avoid fluid of any kind to get into the battery pack.

## Special Features

- Passive cooling
- Galvanized iron sheet enclosure
- >2,000 cycles at 80% discharge depth
- Automatic protection against overcharge or over-discharge
- Automatic shut-off at unsafe temperatures
- Advanced Bluetooth APP indicating battery status
- LED Warning indicators showing battery capacity and errors

## Product Configuration

- |   |  |
|---|--|
| 1. Lade- / Entladeterminale Charge / Discharge Terminal | 2. LED-Anzeigen (LED 4 to LED 0) LED Indicators (LED 4 to LED 0) |
|---|--|



## Preparation – Before Charging or Discharging

### General Checking

- Check thoroughly including all the cables for showing no damages

### Polarity Checking

WARNING: Check the polarity before connecting to the charger or the load; make sure the positive and negative terminals are well electrically insulated before use

### DC Mains Supply Checking

- Make sure the DC cable must not be cut, shortened or extended under any circumstances
- Make sure the mains supply complies with the technical specification requirements of the charger and the battery pack

## Charging the Battery Pack

### Connecting the Charger to the Battery Pack

- Make sure the mains supply and the charge profiles of the charger comply with the specifications of the battery pack
- Switch off the charger to avoid electric sparks and connect it to the battery pack
- Connect the charger to mains supply and switch on the charger
- The battery pack is charging. The LED indicator turns on or blinks as follows:

Charging - State of Charge (SOC)	LED 4	LED 3	LED 2	LED 1	LED 0
0-14 %	Blinking	Off	Off	Off	Off
15-39 %	On	Blinking	Off	Off	Off
40-64 %	On	On	Blinking	Off	Off
65-89 %	On	On	On	Blinking	Off
90-100 %	On	On	On	On	Off

### Charging the Battery Pack

- Low Temperature Charge Method: 0.1C (i.e. 10A) from 0 to 10°C, Constant Current Charging
- Standard Charge Method: 0.2C (i.e. 20A), Constant Current Charging
- Maximum Charge Current: 0.5C (i.e. 50A), Constant Current Charging

### Charging Advice

The working environment of the battery pack may affect the charging performance. The optimum charging condition is from 0°C to 45°C and at 60+/-25% relative humidity. You are advised to ensure a suitable working environment for the battery pack. Otherwise, the charging efficiency, battery capacity and battery lifetime may be adversely affected.

## Discharging the Battery Pack

### Before Discharging

- Make sure that load / device is switched off. Otherwise electric sparks may occur
- Connect the battery pack to load / device and switch on the load / device
- The battery pack is discharging. The LED indicator turns on or blinks as follows:

Discharging - State of Charge (SOC)	LED 4	LED 3	LED 2	LED 1	LED 0
80-100 %	On	On	On	On	Off
55-79 %	On	On	On	Off	Off
30-54 %	On	On	Off	Off	Off
10-29 %	On	Off	Off	Off	Off
0-9 %	Blinking	Off	Off	Off	Off

### Discharging the Battery Pack

- Standard Discharge Method: 0.5C (i.e. 50A), Constant Current Discharging
- Maximum Discharge Current: 1C (i.e. 100A), Constant Current Discharging

### Discharging Advice

The working environment of the battery pack may affect the discharging performance. The optimum discharging condition is from -10°C to 60°C and at 60+/-25% relative humidity. You are advised to ensure a suitable working environment for the battery pack. Otherwise, the discharging efficiency, battery capacity and battery lifetime may be adversely affected.

## Storage and Caring of the Battery Pack

### Battery Storage:

As there are chemical reactions within the cells, the battery performance deteriorates over time and this is absolutely normal. If storage is required, the battery pack should be charged to 100% state of charge (SOC) for storage. Under different storage conditions, the recommended charging period is varied:

- The battery pack should be charged and discharged fully once every 3 months for maintenance.
- Under -20°C to 25°C: Charge to full and the battery pack can be kept for 3 months
- Under -20°C to 45°C: Charge to full and the battery pack can be kept for 1 month

Storing the battery pack under extreme conditions speeds up the degradation of the cells. In the long run, this would greatly reduce the battery capacity and lifetime.

### Battery Care:

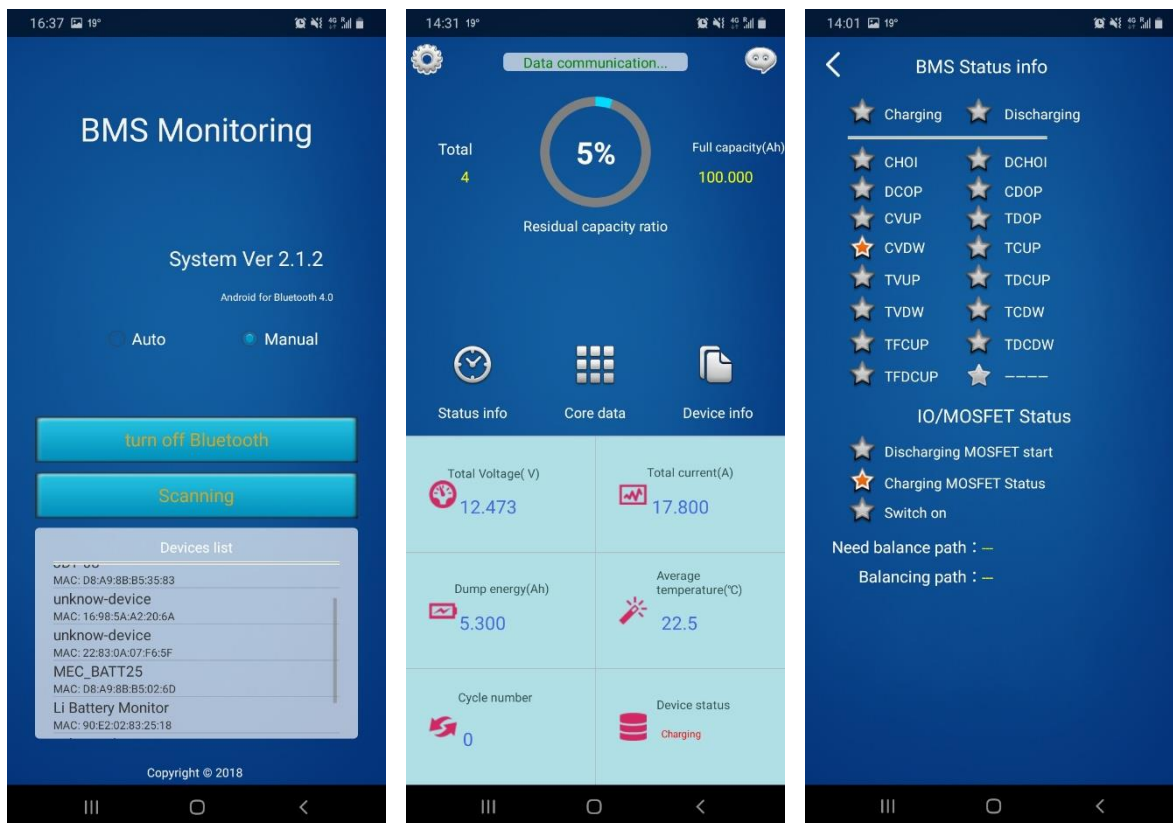
- Never expose the battery to high temperatures, as this reduces the battery lifetime.
- Exercise the battery pack once every 3 months for maintaining its health.
- If possible, always disconnect the battery from the load and insulate the positive and negative terminals electrically when being stored over long period of time.
- Store the battery pack in a dry and cool place at its full capacity.

## Bluetooth APP

### Installation:

- Get the Bluetooth APP apk file from MEC
- Click the apk file on your mobile phone to install the Bluetooth APP

### Operation:



- Turn on the Bluetooth of your phone and click “scan”, wait until the scanning process is finished.
- Your device name would be “MEC\_BATT###”. ## is the serial number of your battery pack. Click on the device name in the list.
- A green colored “Connected” would appear on the top when the communication is successful.
- Information such as state of charge (SOC), total voltage, cell voltages, total current, average temperature and BMS status can then be seen via the APP.

## Troubleshooting

**Fault Conditions:** In case the BMS goes into protection mode due to short circuit, overcharge, over-discharge, at extreme current or unsafe operating temperatures, the LED indicator turns on or blinks according to the following table:

Events	LED 4	LED 3	LED 2	LED 1	LED 0
Mosfet failure at charge	Blinking	Blinking	Blinking	Blinking	Blinking
Mosfet failure at discharge	Blinking	Blinking	Blinking	Blinking	Blinking
Voltage detection wire disconnected	Off	Off	Off	Blinking	On
Temperature detection wire disconnected	Off	Off	Off	Blinking	On
Overcurrent protection at charge	Off	Off	Blinking	Off	On
Overcurrent protection at discharge	Off	Off	Blinking	Off	On
Short circuit protection	Off	Off	Blinking	Off	On
Overtemperature protection	Off	Blinking	Off	Off	On
Temperature difference protection	Off	Blinking	Off	Off	On
Low temperature protection at charge	Off	Blinking	Off	Off	On
Low temperature protection at discharge	Off	Blinking	Off	Off	On

**Low Energy Condition:** The LED 4 is blinking and this is a friendly reminder for you to charge the battery pack.

## Advice for Disposal



It is strictly prohibited to dispose the battery as mixed municipal waste according to the Battery Directive 2002/96/EC. It must be disposed at the local collection points. To protect the environment, please contact the communal administrative agency regarding the nearest collection point. The battery pack follows the RoHS-directive EU 2015/863 for the restriction of the use of certain hazardous substances in electrical and electronic equipment.



## Disclaimer of Warranty

The warranty period (see our General Terms and Conditions) starts with the battery pack being dispatched by the manufacturer. The Company accepts liability by guaranteeing to working hours and spare parts only.

For damages caused by non-observance of the operating instructions, inappropriate start up or handling as well as dismantling, reconstructions or modifications of the battery pack, the warranty claim expires and the Company assumes no liability for consequential damages to any properties or persons in connection with or arising from the purchase and use of the battery pack.

We reserves the rights to configure the battery pack as per actual needs and the manual may not reflect the most updated conditions of the product at all times. Please contact us should you need any technological support.

## Technical Specifications

Allgemeinen Spezifikationen   General Specifications	
Modell   Model	12V/100Ah LiFePO4 Batterie   Battery
Zellenchemie   Cell Chemistry	3.2V/100Ah LiFePO4 Prismatische Zellen   Prismatic Cells
Zellenkonfiguration   Cell Configuration	4S1P
Bemessungskapazität   Rated Capacity (Ah)	100Ah @0.2C Abgaberate   Discharge Rate
Nom. Spannung   Nominal Voltage (V)	12.8V
Bemessung Energie   Rated Energy (kWh)	1.28kWh
Spannungsbereich   Voltage Range (V)	11.2 – 14.4V
Ladezyklen   Cycle Life	>2,000 zyklen mit 80% Entladungstiefe zu 25°C >2,000 cycles with 80% discharge depth at 25°C
Restkapazität (%) nach 2,000 Lade-Entladezyklen Remaining Capacity (%) after 2,000 Charge/Discharge Cycles	≥80% der Anfangskapazität   of initial capacity
Aufladung   Charging	
Ladestrom bei niedriger Temperatur Low Temperature Charge Current (A)	0.1C/10A @0°C to 10°C (Konstantstromladung   Constant Current Charging)
Standard Ladestrom   Standard Charge Current (A)	0.2C/20A (Konstantstromladung   Constant Current Charging)
Max. Ladestrom   Maximum Charge Current (A)	0.5C/50A (Konstantstromladung   Constant Current Charging)
Lastbedingungen   Charge Condition	@0°C to 45°C
Entladung   Discharging	
Standard Entladestrom   Standard Discharge Current (A)	0.5C/50A (Konstantstromentladungen   Constant Current Discharging)
Max. Entladestrom   Max. Discharge Current (A)	1C/100A (Konstantstromentladungen   Constant Current Discharging)
Abflussverhältnisse   Discharge Condition	@-10°C to 60°C
Batteriemanagement & Kommunikation   Battery Management & Communication	
Batteriemanagement   Battery Management	Batteriemanagementsystem (BMS) mit Zellausgleich und Sicherheitsschutzfunktionen Battery Management System (BMS) with cell balancing and safety protection features
Bluetooth APP   Bluetooth APP	Erweiterte Bluetooth APP zeigt Batteriestatus Advanced Bluetooth APP indicating battery status
Warnanzeige   Warning Indicators	LED-Anzeigen zeigt die Batteriekapazität und Fehler LED Indicators showing battery capacity and errors
Schutz / Haltbarkeit   Protection / Durability	
Wärmeabfuhr   Heat Dissipation	Passive Kühlung   Passive Cooling
Zellausgleich   Cell Balancing	Automatisch (passiv)   Automatic (Passive)
Sicherheit   Safety	Überladung, Überentladung, Überströme oder unsichere Betriebstemp. Schutzes Overcharge, over-discharge, over-current and unsafe operating temp. protection
Gehäuse & Klemmen   Enclosure & Terminals	
Gehäuse   Enclosure	1.2mm Eisenblech, galvanisch und pulverbeschichtet 1.2mm iron sheet, electro-plated and powder coated
IP Klasse   IP Code	IP65
Abmessungen & Gewicht   Dimensions & Weight	200x320x178mm / 15kg
Aufladung und Entladung Klemmen Charge- and Discharging Terminals	Offene schraubklemmen Opened-ended screw terminals
Wartung & Lager   Maintenance & Storage	
Wartung   Maintenance	Das Batteriepack sollte alle 3 Monate vollständig geladen und entladen werden. The battery pack should be charged and discharged fully once every 3 months.
Lagerung bei -20°C to 25°C Storage Condition @ -20°C to 25°C	3 Monate, Halten bei 100% Kapazität Can be kept for 3 months at 100% capacity
Lagerung bei -20°C to 45°C Storage Condition @ -20°C to 45°C	1 Monat, Halten bei 100% Kapazität Can be kept for 1 month at 100% capacity
Gewährleistung   Warranty	
Gewährleistung   Warranty	3 Jahre   Years

**Batterie Schutzparameter | Battery Protection Parameters**

Beschreibung   Description	Daten   Value	Handeln   Action
Einzelzellenspannung Oberen Grenzwert Alarm Single cell voltage upper limit alarm	3.6V	Unterbrechung im BMS => Laden / Entladen beenden BMS open circuit => Stop charging / discharging
Einzelzellenspannung Untergrenze Alarm Single cell voltage lower limit alarm	2.8V	
Gesamtspannung Oberen Grenzwert Alarm Total voltage upper limit alarm	14.4V	
Gesamtspannung Untergrenze Alarm Total voltage lower limit alarm	11.2V	
Lade- / Entlade Temperatur Oberen Grenzwert Alarm Charge / discharge temperature upper limit alarm	65°C	
Lade- / Entlade Temperatur Untergrenze Alarm Charge / discharge temperature lower limit alarm	-20°C	
Lade- / Entladestrom Oberen Grenzwert Alarm Charge / discharge current upper limit alarm	120A	

**Customer Supports****HONG KONG, CHINA****Asia Pacific Sales and Customer Service**

Tel: + 852 2366 9610

Email: [mec@mec-mainland.com](mailto:mec@mec-mainland.com)**VILLACH, AUSTRIA****European Sales Arm****General Enquiry**

Tel: +43 (0) 4242 55100

Email: [office@mec-energietechnik.at](mailto:office@mec-energietechnik.at)**Technical Consultation**

Wilfried Steger

Tel: +43 (0) 4242 55100-27

Email: [w.steger@mec-energietechnik.at](mailto:w.steger@mec-energietechnik.at)

**Technische Änderungen vorbehalten. Für Druckfehler übernehmen wir keine Haftung.  
Subject to technical modifications. We assume no liability for misprints.**