LiFePO4 Battery Specification

Model: AL12V460HFA-BCH
EAN: 4738479244828

Note: label may differ slightly from actual product

No.	Revision	Description	Author	Check	Date
1	2.0	2.0 release	WB	MvM	18-12-24
2	2.1	Updated Formatting and layout	MvM	JD	24-2-25

1 Features

- Integrated smart BMS (Battery Management System).
- Bluetooth functionality; The APP is available on the App store or Play store; Through Bluetooth, users can monitor the battery's status.
- This battery has a CAN-bus communication interface that supports ACES, Victron (Default 500 kbit/s), NMEA2000 protocols.
- Integrated heater, which enables charging below 0 ^{o}C
- Safe LFP (LiFePO4) chemistry using prismatic cells with high Power Density.
- Supports parallel connection.
- Electronic Short Circuit protection and integrated fuse.
- BMS Protections: Overload, temperature, short-circuit, Cell overcharge, Cell overdischarge .
- Durable ABS casing with handgrips.
- 5 years of warranty according ACES warranty conditions.

2 Safety related instructions

- The batteries shall only be opened and repaired by ACES or by ACES certified companies.
- If the batteries are opened or repaired by anyone other than ACES, the warranty will be void, and ACES will no longer be liable for the safety of the battery.
- If the battery case is damaged in some way because of an accident, contact the manufacturer, ACES, immediately.
- For transportation, only the original packaging or packaging compliant with international UN packing regulations for dangerous goods, Class 9, should be used.
- Do not use the battery in high electrostatic or (electro)-magnetic fields.
- Keep the battery away from heat sources like heaters, fire, and extremely hot environments.
- Ensure the battery is used within the temperature boundaries specified in Figures 1 and 2.
- Do not use the battery if the available capacity has reduced to less than 70%; this indicates the battery has reached its end of life and should be properly disposed of.
- The battery is IP65 rated, meaning it is splash-proof but not suitable for underwater use.
- Safety cannot be guaranteed if the battery is used outside the specifications.
- Do not use the battery in a series connection; this may cause defects.

3 Usage Instructions

- Please read the user manual/battery specification carefully before use.
- Ensure the battery is fully charged after each use. If the battery is nearly discharged and left unused for an extended period, there is a risk of capacity loss and deep discharge. Deep discharge may damage the cells, and this situation is not covered by warranty.
- It is recommended not to discharge the battery below 20% SOC or the specified voltage.
  An undervoltage protection level should be set in the application.
- Batteries can be connected in parallel. Consult ACES if you plan to use more batteries in parallel as specified.
- If the battery will not be used for more than one month charge it to 50-80% SOC and store it in an ambient temperature between 5-30°C. Disconnect or switch off the connection from the positive pole to prevent deep discharge.
  When not in use for an extended period, check the battery SOC on the app at least every three months.
- The battery shall be charged regularly to 100%, this will assure accurate SOC readings and prevent cell unbalance.
- Always use the battery in the normal upright position; consult ACES if mounting in a different position is desired.
- It is recommended to mount the battery with special straps or clamps with rubber protection.
- Connect the battery using M8 screws and cable lugs with 8mm holes (with a torque of approximately 8-10 Nm). If the screws are not properly tightened, it can result in overheating of the cables and terminals.
- The cable cross-section should be suitable for the maximum continuous current, and a suitable cable boot should be used for insulation.

4 Delivered in the box

- The battery
- Pole screws, pole isolation boots
- The user manual
- CAN termination resistor 120Ω
- CAN cable

5 Performance

Performance item	Value
ELECTRICAL	
Voltage Category	12V
Nominal Voltage	12.8V
Nominal Capacity @ 0.2C	460Ah
Nominal Energy @ 0.2C	5888Wh
Operational Voltage range	11V – 14.6V
Capacity vs. Ambient Temperature @0.2C	See figure 3
Self-Discharge rate	<3%/month; <15%/year
Internal Fuse	500A
Cycle Life at 80% DOD and 0.2C (See figure 3)	6000 cycles
Parallel Connection	Up to 8 batteries
Series Connection	Not allowed
Communication Interface	Bluetooth
Communication Protocol CAN-bus	ACES, Victron (Default: Victron 500 kbit/s), NMEA200
DISCHARGE	
Continuous Current down to 20% SOC	300A
Maximum Surge/Peak Current (for 5 seconds)	500A
Max. Discharge Current Protection (after 30 seconds)	330A
BMS Cut-Off Temperature	70°C
Over discharge Protection	10V
Recommended Discharge-End Voltage	12V
Fast Short Circuit Protection	Yes
CHARGE	
Maximum Charge Current	200A
Recommended Charge Current	40 – 100A
Maximum Charge Voltage (to 100%)	14.4V – 14.6V
Float Voltage	13.6V – 13.8V
Charging Characteristic	CC/CV
Recommended ACES Charger	ABC700-1220LF
MECHANICAL	
Dimensions (L x W x H); see drawing	520 x 269 x 220 mm
Weight	42 kg
Terminal size, torque, cable cross section	M8; 8 –12nm; cable cross section ≥70mm2
Cell Type	Prismatic
ENVIRONMENTAL	
Discharge Operation Temperature and %RH	-20°C – 60°C; 5% – 85% RH (see figure 1)
Charge Operation Temperature and %RH	-20°C – 50°C; 5% – 85% RH (see figure 2)
Storage Temperature	Up to 2 months -10°C – 40°C; Up to 6 months 0°C – 30°C
Storage Recommendation	5°C – 30°C; 5% – 75% RH
Operation Altitude	< 3000m
Protection IP Class	IP65

Note 1: *All performances are at 25°C temperature unless otherwise stated*

6 APP functionality

7 Charge and discharge characteristics

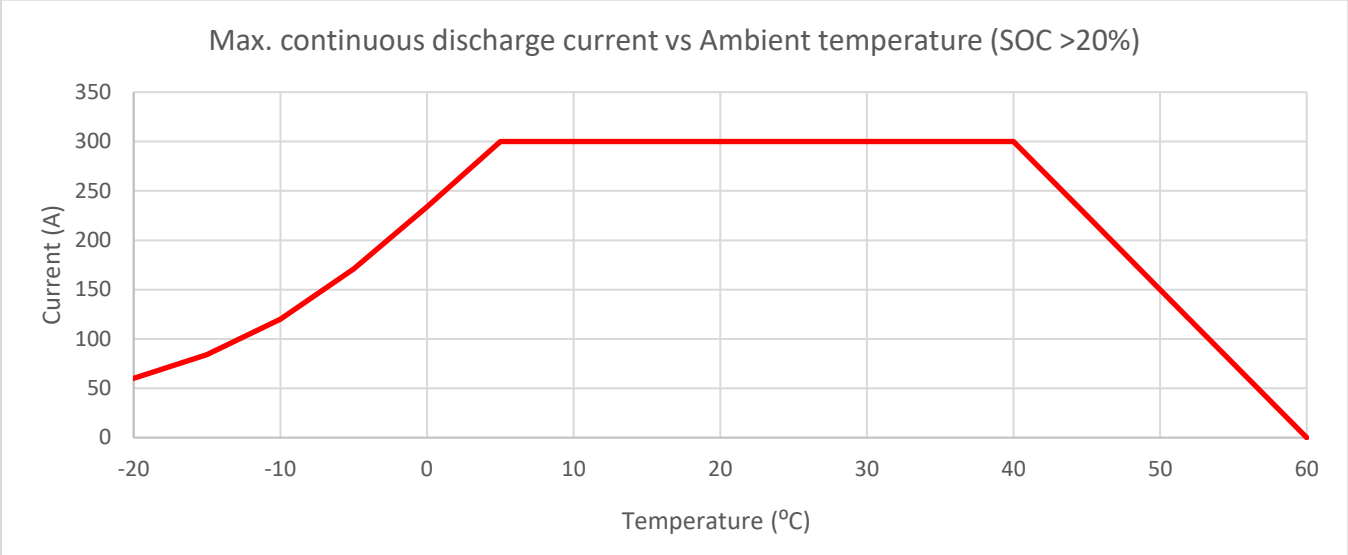


Fig. 1

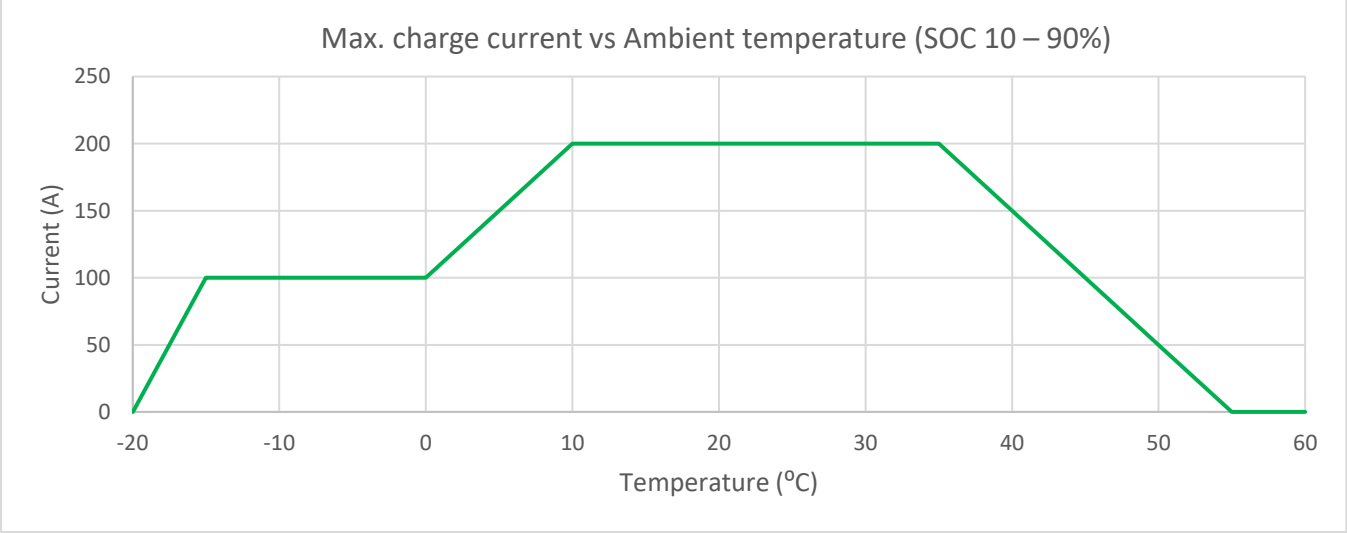


Fig. 2

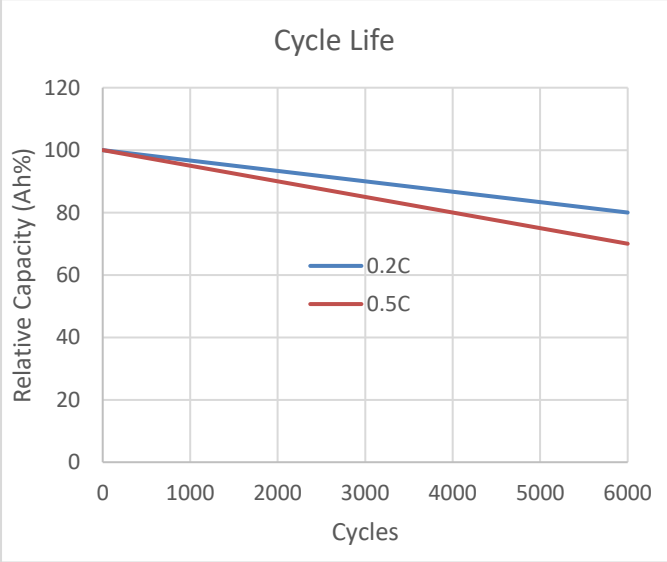


Fig. 3

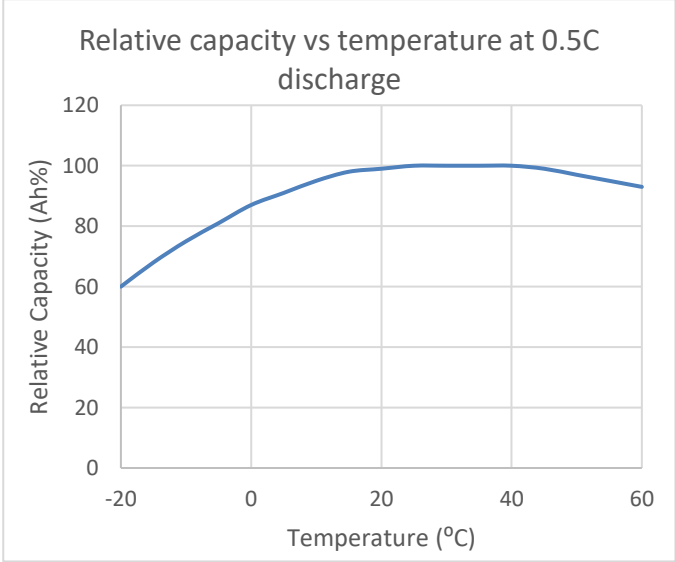
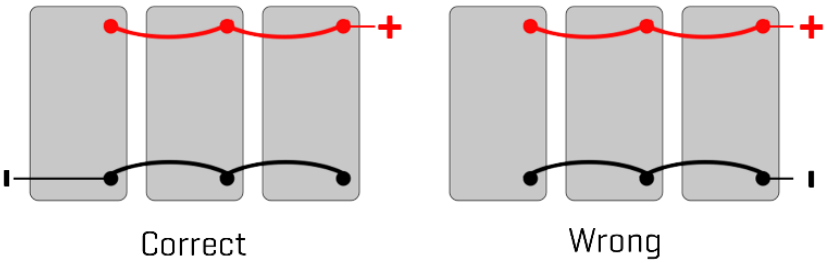


Fig. 4

8 Parallel connection of batteries



Before parallel connection follow the instructions below:

- Make sure all the batteries are fully charged and have the same voltage
- Use only batteries with the same capacity
- The best is to use new batteries (to ensure that both batteries have the same wear level, namely no wear)
- Use only short cables suitable for the amount of current
- Disconnect the CAN power supply (CAN system needs to reboot to ensure proper master-slave configuration)

If N batteries are connected in parallel, ensure that N-1 batteries can handle the maximum allowed current. For example, with N batteries in parallel, the maximum current (ImaxN) is calculated as: ImaxN = Imax × (N - 1).

For batteries connected via CAN-bus with Victron or ACES, the formula changes to: ImaxN = 0.9 × Imax × N. In this case, the master battery determines the maximum current based on the connected slaves and their settings.

For the NMEA protocol, the formula is: ImaxN = Imax × (N - 1).

9 Certifications

Certification item	Applicable for
CE	Battery pack
UN38.3, REACH, MSDS	Cell and Pack
IEC62133, IEC62619, UL1642, UL2054	Cell
ROHS	Cell

10 Dimensional drawings