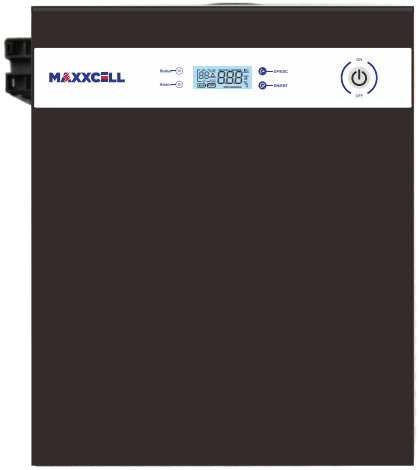
LiFePO4 Battery System for Households

358-010029-01 12-150MAX

MAXXCELL

USER GUIDE

LiFePO4 Battery System for Households



Contents

1 ABOUT THIS MANUAL 1
- 1.1 Purpose 1
- 1.2 Scope 1
- 1.3 Safety Instructions 1

2 INTRODUCTION 2
- 2.1 Features 2
- 2.2 Product Overview 2
- 2.3 Specifications 3
- 2.4 Recommended Settings 3

3. INSTALLATION 4
- 3.1 Unpacking and Inspection 4
- 3.2 Mounting the Unit 4
- 3.3 Connection for Parallel Mode 5

4. OPERATION 6
- 4.1 Operation and Display Panel 7
- 4.2 LCD Display Icons 7

5. LCD SETTING 9

6. DISPLAY INFORMATION 10

7. OPERATING MODE DESCRIPTION 11

8. TROUBLESHOOTING 12
- 8.1 Fault Code Table 12
- 8.2 Warning Code Table 12

9. EMERGENCY SITUATIONS 13
- 9.1 Fire 13
- 9.2 Leaking Batteries 13
- 9.3 Wet Batteries 13
- 9.4 Warranty 13

1 ABOUT THIS MANUAL

1.1 Purpose

This manual describes the introduction, installation, operation and emergency situations of the battery bank. Please read this manual carefully before installations and operation. Keep this manual for future reference

1.2 Scope

This manual provides safety and installation guidelines as well as information on tools and wiring.

1.3 Safety Instructions

WARNING: This chapter contains important safety and operating instructions. Read and keep this manual for future reference

1. Before using the unit, read all instructions and cautionary markings on the unit, the batteries and all appropriate sections of this manual.
2. CAUTION –-- To reduce the risk of injury or damage, please use according to the instructions in this manual
3. Do not disassemble the battery. Take it to a qualified service centre when service or repair is required. Incorrect re-assembly may result in a risk of fire.
4. To reduce risk of electric shock, disconnect all wires before attempting any maintenance or cleaning. Turning off the unit will not reduce this risk.
5. CAUTION – Only qualified personnel can install this device with inverter.
6. For optimum operation of this battery, please follow required specification to select appropriate cable size.
7. Be very cautious when working with metal tools on or around batteries. Dropping tools onto the battery has the potential to cause a short which could cause a fire. Please strictly follow installation procedure.
8. To support a full output load, at least 2 sets of 24V batteries for inverters larger than 3KVA, and at least 2 sets of 48V batteries for inverters larger than 5KVA should be used in parallel.
9. GROUNDING INSTRUCTIONS - This system should be connected to a permanent grounded wiring system. Be sure to comply with local requirements.
10. NEVER cause AC output and DC input to short circuit. Do not connect to the mains when DC input short circuits.
11. Warning!! Only qualified service persons are able to service this device.
12. Battery should be installed indoors and kept away from water, high temperature, mechanical force force and flames.
13. Do not install the battery in temperatures below 0°C or over 45°C,and humidity over 80%.
14. Do not put any heavy objects on the battery.

The batteries cannot be charged with PWM controllers for charging

Special Attention: It is strongly recommended to stop using the load when the battery pack is over-discharged. The battery pack should not be repeatedly force activated for discharge or you may damage the battery cells reducing their life span. If the battery pack is low and the internal BMS failsafe has activated you must charge the battery immediately. If you do not you may need to use the AC or PV activation method to wake the battery. Doing so will reduce the lifespan of your pack

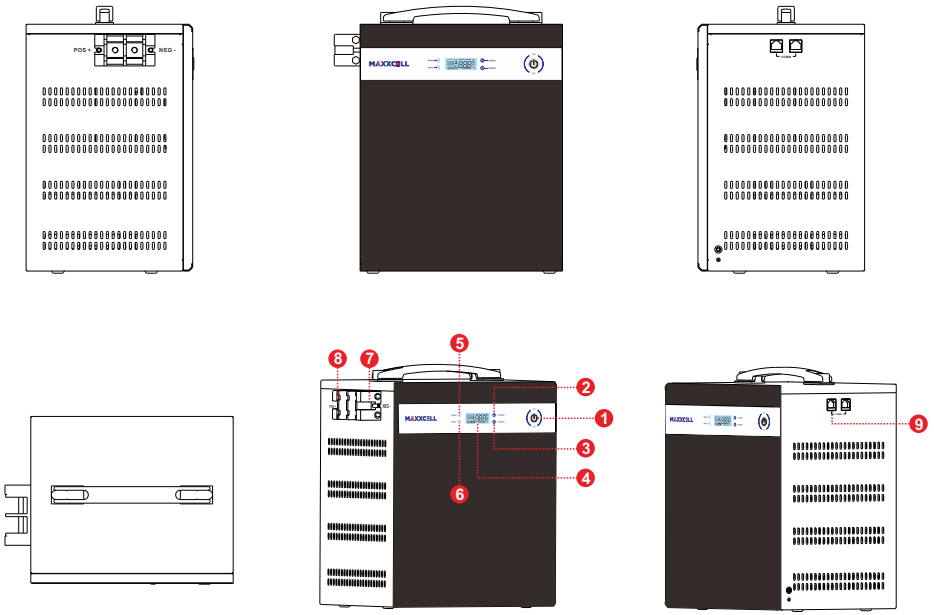
2. INTRODUCTION

Purpose built solar and wind energy storage battery pack. Designed for simple 2 wire installation without the complexity of Inverter and battery BMS compatibility.

2.1 Features

- Iron phosphate-lithium power battery
- Long warranty period:5 years
- High energy density, compact in size
- Photovoltaic system: This battery pack is designed for household and commercial photovoltaic/wind systems.
- Battery management system (BMS): The battery packs built-in BMS monitors its operation and prevents the battery from operating outside design limitations.
- Expandability: This battery pack can be easily expanded by adding expansion battery packs in parallel connection.

2.2 Product Over View



1. ON / OFF
2. UP/ESC
3. DN/ENT
4. LED Display
5. STATUS
6. ALARM
7. Battery Negative -
8. Battery Positive +
9. Communication port

2.3 Specifications

Model	12-150MAX	12-200MAX
Usable Capacity	2KWH	2.5KWH
Voltage	12	12
Nominal Voltage	12.8	12.8
Voltage Range	12-14.4	12-14.4
Recommend Charge Cut-off Voltage	14.4	14.4
Recommend Discharge Cut-off Voltage	12	12
MAX. Charge & Discharge Current	120A	
Recommend Charge & Discharge Current	≤60A	≤80A
MAX. Output Power	1500W	1500W
Recommend Output Power	750W	1000W
DOD	≥95%	
Modules Connection	1~6in parallel	
Communication	RS485	
Ingress Protection	IP21	
Cycle Life	≥3000 @25°C	
Working Temperature Range	Discharge:-20°C to +65°C, Charge:+0°C to +55°C	
Net Weight(KG)	19.2KG	19.5KG
Gross Weight(KG)	20.9KG	21.2KG
Product Dimension(MM)	282*232*346.5MM	282*232*346.5MM
Package Dimension(MM)	393*318*419MM	393*318*419MM

2.4 Recommended Settings

Lithium battery packs are not the same as Lead Acid batteries. Ensure settings are specific to your battery pack as the use of Lead Acid charging profiles on Lithium packs is dangerous.

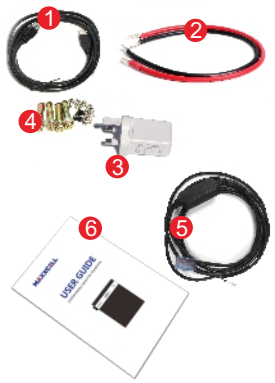
Setting	12-150MAX	12-200MAX
Max. Charging Voltage	14.4V	
Floating charging Voltage	14.4V	
Max. Charging Current	60A*N	80A*N
Cut-off voltage	12V	

Notes: “N” means the number of battery packs connected in parallel.

3. INSTALLATION

3.1 Unpacking and Inspection

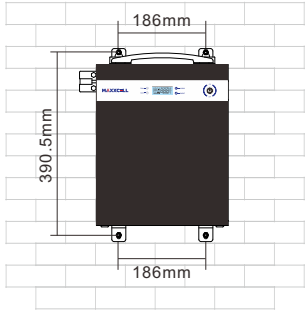
Before installation, please inspect the unit. Make sure that nothing inside the package is damaged. You should have received the following items inside of package.

NO	NAME	SPECIFICATION	PICTURE
1	Communication line 1	Grid activation communication wire (used with 6)	
2	Cables	Used for battery parallel connection	
3	Adapter	Used for activating the pack when grid power recover	
4	Screw	Mounting screw	
5	PV Wake up line	Used for auto restart when PV comeback in off-grid system	
6	User manual	User manual	

3.2 Mounting the Unit

Consider the following points before selecting where to install:

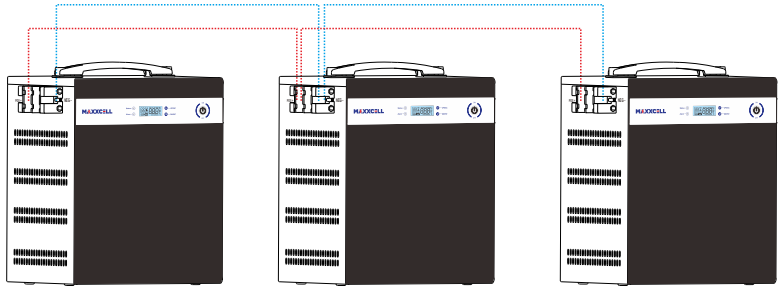
- Do not mount the battery on flammable construction materials.
- The ambient temperature should be between 0°C and 45°C to ensure optimal operation.
- The recommended installation position is to be mounted to the wall vertically.
- Be sure to keep other objects and surfaces as shown in the right diagram to guarantee sufficient heat dissipation and to have enough space for removing wires.



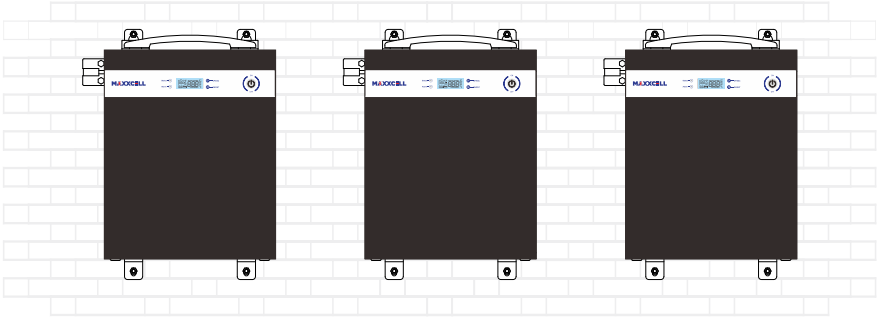
Please follow below steps to implement battery connection:
1.Assemble battery ring terminal based on recommended battery cable and terminal size.
2.To support full output load, 1 set of 12-150MAX /12-200MAX batteries for inverters larger than 1KVA, and at least 2 sets of 12-150MAX /12-200MAX batteries for inverters larger than 2KVA should be used in parallel.
Note: if you need the battery to wake-up when grid power returns, connect the battery with grid use power adapter and communication line 1 shown in the package list.

3.3 Connection for Parallel Mode

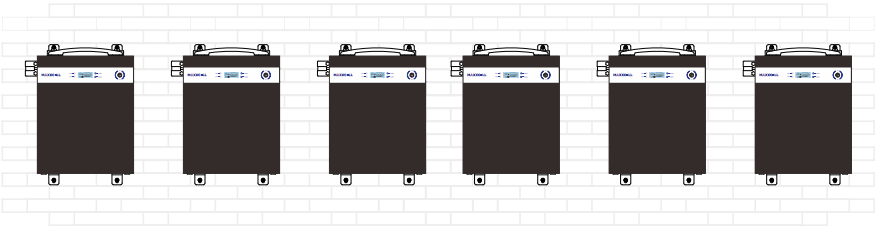
The battery supports parallel connection for capacity expansion. Connect parallel batteries as displayed below.



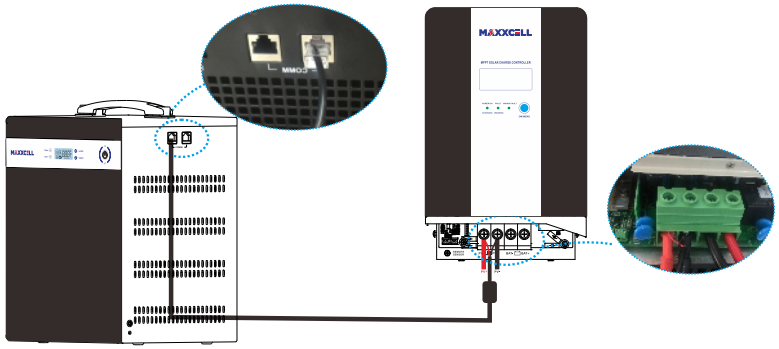
Note: After select the positive and negative poles of one of the battery packs to output (the upper battery pack or the lower battery pack, you can not select the positive and negative poles of the two battery packs at the same time). After confirming the correct connection of the inverter, controller and batteries, you can switch any battery on and the battery bank is ready for use.



Note: A maximum of 6 batteries, connected in parallel is permitted



For pure off grid systems, the PV awake wire needs to be connected with an MPPT charge controller if the battery pack is charged by solar panels only . The connection diagram is shown as below :

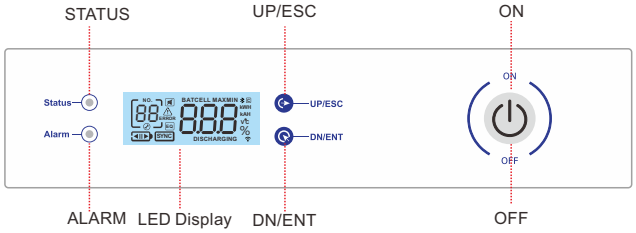


4. OPERATION

Once the batteries are connected correctly, simply press the On/Off button to enable the output of the battery pack.

4.1 Operation and Display Panel

The Operation and display panel, shown in the below chart, is on the front panel of the battery pack.
It includes two LED indicators, two function keys, ON/OFF key and a LCD display indicating the operating status and power information



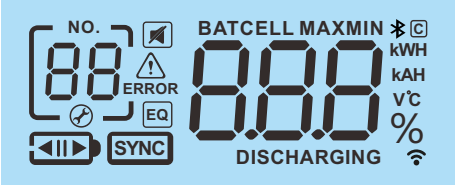
LED Indicator

LED Indicator			Messages
STATUS	Green	Solid On	The battery pack is discharging.
		Flashing	The battery pack is charging.
ALARM	Red	Solid On	Fault occurs in the battery pack.
		Flashing	Warning condition occurs in the battery pack.

Function Keys

Function Key		Description
UP/ESC	Short press	To go to last selection.
	Press and hold	To exit setting mode.
DN/ENT	Short press	To go to next selection.
	Press and hold	To confirm the selection in setting mode or enter setting mode.

4.2 LCD Display Icons



Icon	Function description
Battery Pack Information	
BAT	Indicates the battery pack information.
BAT 8.8.8 kWH kAH V℃ %	Indicate the battery pack voltage, current.

Icon	Function description
Battery Cell Information	
CELL	Indicates the battery cell information.
CELL MAXMIN 8.8.8 kWH kAH VC %	Indicate the battery cell maximum voltage, minimum voltage, maximum temperature, minimum temperature, every cell voltage, every cell temperature.
Configuration Program, Fault Information and Cell Number	
88	Indicates the setting programs.
88 ERROR	Indicates the warning and fault codes. Warning: flashing with warning code. Fault: lighting with fault code.
NO. 88	Indicates the cell number.
Mode Operation Information	
CHARGING	Indicates the battery pack is charging.
DISCHARGING	Indicates the battery pack is discharging.
	Indicates the battery pack charge MOS is switch on.
	Indicates the battery pack discharge MOS is switch on.
EQ	Indicates the battery pack is balancing.
Communication Sign	
C	RS485 is connected and communication is successful.
	Bluetooth is connected and communication is successful.

5. LCD Setting

Press and hold the “DN/ENT” to enter Settings mode, Press the “DN/ENT”or “UP/ESC” button to select Settings Program required. Then, press and hold “DN/ENT” button to confirm the selection. “UP/ESC” button to exit.

Setting items:

Program	Description	Title	Selectable option	
00	Exit setting mode	**Escape** 00 ESC	**NULL**	
01	Pack Type	01 TYP	**12-150MAX** 01 150 **12-200MAX** 01 200	Automatic identification of the battery pack type, and can not be set.
10	Balance Mode	10 bAL	**Cell balance default is enable.** 10 EN **Cell balance is disable.** 10 dIS	
11	Fault Record	11 Fr	**Fault record default is enable** 11 EN **Fault record is disable** 11 dIS	
12	Sleep Countdown	12 SLP	**1 day(default)** 12 1d	If the battery is not charging or discharging, turn it off after a day, the options are 1H, 2H, 4H, 8H, 12H, 1d, 3d, 7d, 30d.
20	Communication Address	20 Add	**Address is 1(default)** 20 1	Communication address range is 1-30
21	Backlight Mode	21 bL	**Backlight Enable(default)** 21 EN **Backlight Disable** 21 dIS	
22	Auto return to default display screen	22 dSP	**Return to default display screen (default)** 22 dEF **Keep lastest screen** 22 rEP	If selected, no matter how users switch display screen, it will automatically return to default display screen (SOC) after 1 minute of inactivity. If selected, the display screen will stay at latest screen user finally switches.

6. Display Information

The LCD displays battery details as per the below table. To change the LCD information displayed, press the“DN/ENT”or “UP/ESC”key.

Selectable information	LCD display
SOC	SOC = 100% 100 %
Battery Voltage	Battery Voltage = 12.8V BAT 12.8 V
Battery Current	Battery Current = 0A BAT 0 A
Maximum Cell Voltage	Maximum Cell Voltage = 3.60V CELL MAX 3.60 V
Minimum Cell Voltage	Minimum Cell Voltage = 3.00V CELL MIN 3.00 V
Maximum Cell Temperature	Maximum Cell Temperature = 45℃ CELL MAX 45 ℃
Minimum Cell Temperature	Minimum Cell Temperature = 5℃ CELL MIN 5 ℃
No.1 Cell Voltage	No.1 Cell Voltage = 3.20V NO. 01 CELL 3.20 V
No.2 Cell Voltage	No.1 Cell Voltage = 3.20V NO. 02 CELL 3.20 V
No.3 Cell Voltage	No.3 Cell Voltage = 3.20V NO. 03 CELL 3.20 V
No.4 Cell Voltage	No.3 Cell Voltage = 3.20V NO. 04 CELL 3.20 V
No.1 Cell Temperature	No.1 Cell Temperature = 25℃ NO. 01 CELL 25 ℃

Software Version	Software Version = 1.00 SW 100

7. Operating Mode Description

Operation	Mode Description	LCD Display
Standby Mode	No output is supplied by battery pack, and can not charge in this mode	80 %
Normal Mode	The battery can be charged or discharged, at this moment, there is no charge and no discharge.	80 %
	The battery can be charged or discharged, at this moment, it is charging.	80 % CHARGING
	The battery can be charged or discharged, at this moment, it is discharging.	80 % DISCHARGING
Overdischarge Mode	In this mode, the battery is forbidden to discharge, but can be charged.	80 % CHARGING
Overcharge Mode	In this mode, the battery is forbidden to charge, but can be discharged.	80 % DISCHARGING
Fault Mode	Errors are caused by inside circuit error or external reasons such as high temperature, output short circuit etc	21 ERROR 80 %

8. Troubleshooting

8.1 Fault Code Table

Fault	CodeFault Information
01	Battery voltage is too high.
02	Battery voltage is too low.
03	Charge current is too high.
04	Discharge current is too high.
05	Cell voltage is too high.
06	Cell voltage is too low.
07	Cell temperature is too high.
08	Cell temperature is too low.
09	MOS temperature is too high.
11	Sample sensor is abnormal.

8.2 Warning Code Table

Warning	CodeWarning Information
23	Charge current is high.
24	Discharge current is high.
27	Cell temperature is high for charge.
28	Cell temperature is low for charge.
35	Cell voltage difference is too large.

9. EMERGENCY SITUATIONS

9.1 Fire

In case of fire, make sure that the following equipment is available near the battery system

• DC and AC Isolation switches

• NOVEC 1230, FM-200, or dioxide extinguisher

Batteries may explode when heated above 150°C. KEEP AWAY from the battery if it catches fire.

9.2 Leaking Batteries

If the battery pack leaks electrolyte, avoid contact with the leaking liquid or gas. If there has been a leakage and contact has been made:

- Inhalation: Evacuate the contaminated area, and seek urgent medical attention.
- Contact with eyes: Rinse eyes with running water for 5 minutes, and seek urgent medical attention.
- Contact with skin: Wash the affected area thoroughly with soap and water, and seek urgent medical attention.
- Ingestion: Induce vomiting, and seek urgent medical attention.

9.3 Wet Batteries

If the battery pack is wet or submerged in water isolate immediately and restrict all access. Contact your supplier for assistance.

9.4 Damaged Batteries

Damaged batteries are not fit for use, dangerous and must be handled with the utmost care. It may leak electrolyte or produce flammable gas. If the battery pack seems to be damaged, pack it in its original container, and then return it to your supplier.

9.4 Warranty

Products that are operated strictly in accordance with the user manual are covered by the warranty within the first 5 years from the date of purchase. Any violation of this manual may void the warranty.

Limitation of Liability

Any product damage or property loss caused by the following conditions, MaxxCell does not assume any direct or indirect liability.

- Product modified, design changed or parts replaced.
- Changed, or attempted repairs and erasing of series number or seals;
- System design and installation are not in compliance with standards and regulations;
- The product has been improperly stored in owner\user's premises;
- Transport damage (including painting scratch caused by movement inside packaging during shipping). A claim should be made directly with the shipping or insurance company.