Upower
ecoline

Multi-application - LiFePO4 Power

UE-48Li3600WH

Issued Version > V2.1

LITHIUM IRON PHOSPHATE BATTERY

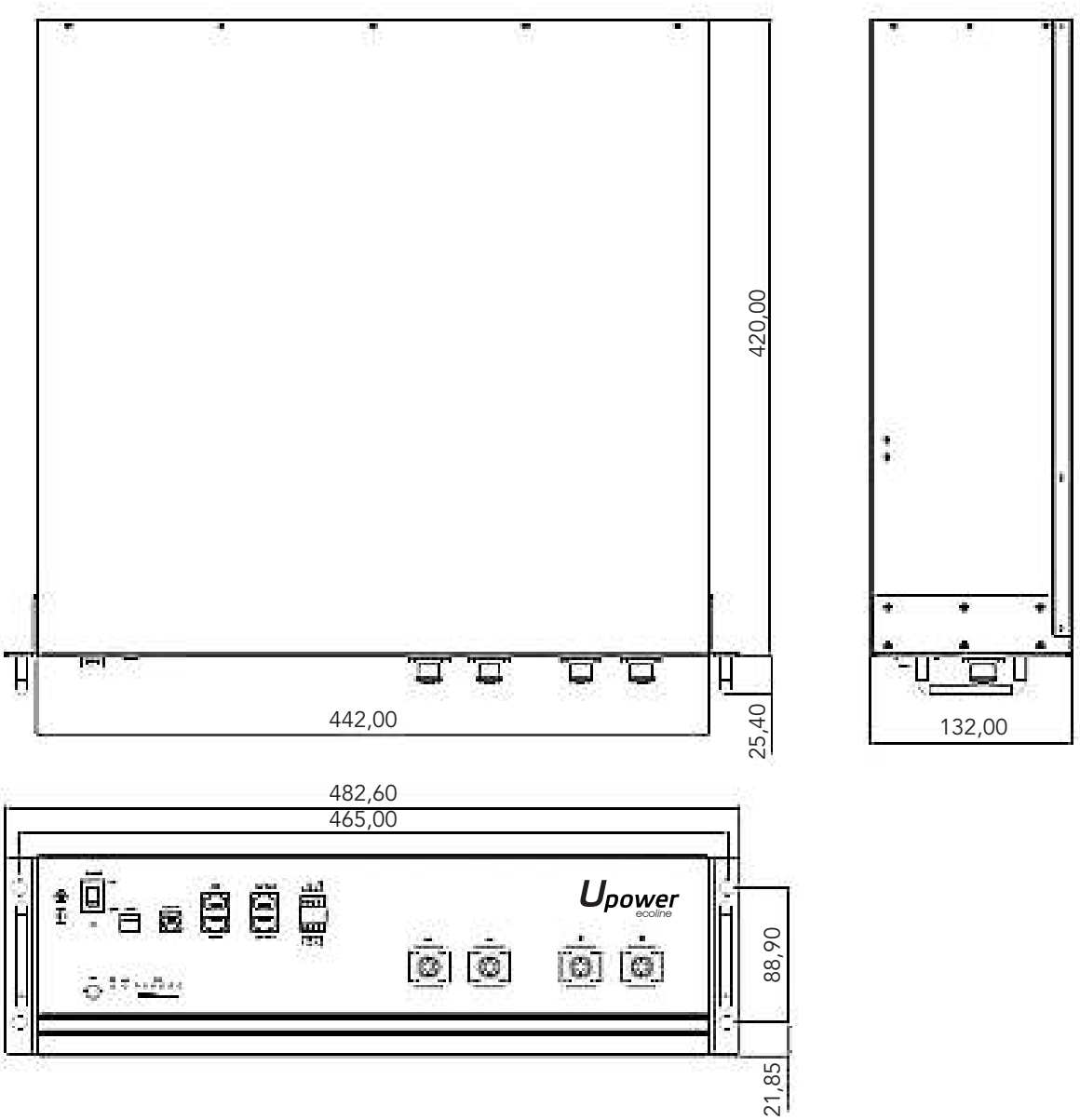
1. Introduction

UE-48Li3600WH lithium iron phosphate battery is one of new energy storage products developed and produced by Upower, it can be used to support reliable power for various types of equipments and systems. UE-48Li3600WH is especially suitable for application scene of high power, limited installation space, restricted load-bearing and long cycle life. UE-48Li3600WH has built-in BMS battery management system, which can manage and monitor cells information including voltage, current and temperature. What's more, BMS can balance cells charging and discharging to extend cycle life. Multiple batteries can connected in parallel to expand capacity and power in parallel for larger capacity and longer power supporting duration requirements.

2. Features

- The whole module is non-toxic, non-polluting and environmentally friendly.
- Cathode material is made from LiFePO4 with safety performance and long cycle life.
- Battery management system (BMS) has protection functions including over-discharge, over-charge, over-current and high/low temperature.
- The system can automatically manage charge and discharge state and balance current and voltage of each cell.
- Flexible configuration, multiple battery modules can be in parallel for expanding capacity and power.
- Adopted self-cooling mode rapidly reduced system entire noise.
- The module has less self-discharge, up to 6 months without charging it on shelf, no memory effect, excellent performance of shallow charge and discharge.
- Working temperature range is from -10°C to 50°C, (Charging 0°C~50°C; discharging -10°C~50°C) with excellent discharge performance and cycle life.
- Small size and light weight, standard of 19-inch embedded designed module is comfortable for installation and maintenance.

3. Specifications

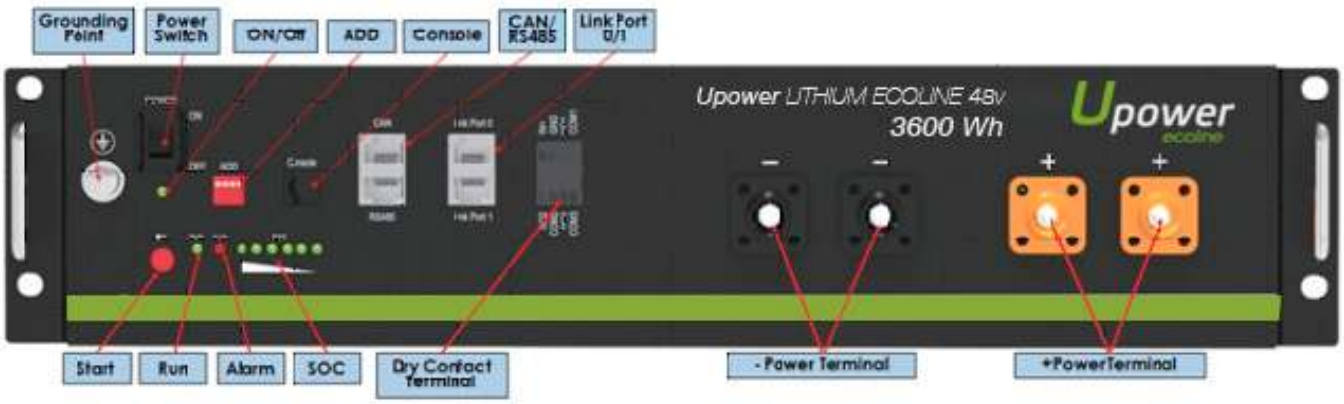


Basic Parameters	UE-48Li3600WH
Nominal Voltage (V)	48
Nominal Capacity (Wh)	3552
Usable Capacity (Wh)	3200
Dimension (mm)	442*420*132
Weight (Kg)	31
Discharge Voltage (V)	44.5 ~ 53.5
Charge Voltage (V)	52.5 ~ 53.5
Recommend Charge/Discharge Current (A)	37
Max. Charge/Discharge Current (A)	74
Peak Charge/Discharge Current (A)	100A@15sec
Communication	RS485, CAN
Configuration (max. in 1 battery group)	8pcs
Working Temperature	0°C~50°C Charge -10°C~50°C Discharge
Shelf Temperature	-20°C~60°C
Protective class	I
Cooling type	Natural Cooling
IP rating of enclosure	IP20
Humidity	0 ~ 85%
Certification	TÜV / CE / UN38.3
Design life	10+ Years (25°C/77°F)
Cycle Life	>4,500 25°C
Reference to standards	IEC62619, IEC62040, IEC62477-1, UL1642, IEC61000-6-2, IEC61000-3

4. Equipment Interface Instruction

This section details the front and back panel of the interface functions.

UE-48Li3600WH Product Front Interface



Power Switch

Power Switch: to turn ON/OFF the whole battery BMS standby, no power output.

ON/OFF

ON/OFF light: green LED lighting to show the Power Switch is ON, and the BMS has electricity (No power output).

RUN

RUN light: green LED flashing to show the battery running status.

Alarm

Alarm light: red LED flashing to show the battery has alarm, and lighting to show the battery is under protection.

SOC

SOC light: 6 green LEDs to show the battery's current capacity.

Start

Start Button: press more than 0.5s to start the battery module, Power output ready.

ADD Switch

ADD Switch: 4 ADD switches, Dip1 to definite different baud rate ("0" is 115200, "1" is 9600). "0"and"1", refer to picture right. "0XXX" setup the baud rate 115200, and "1XXX" setup the baud rate 9600. **The settings will be active only after restart the battery**.

The slave battery's address will be assigned automatically. 1 master battery can supervise 7 slave batteries (maximum 8 batteries in each battery group). Multiple battery group should setup the master batteries' ADD switch. (Refer to Chapter 4 / D)

Dip2	Dip3	Dip4	Group Address Number
0	0	0	0th: Single battery group's master battery should setup as this.
1	0	0	1st: 1st battery group's master battery should setup as this.
0	1	0	2nd: 2nd battery group's master battery should setup as this.
1	1	0	3rd: 3rd battery group's master battery should setup as this.
0	0	1	4th: 4th battery group's master battery should setup as this.
1	0	1	5th: 5th battery group's master battery should setup as this.
0	1	1	6th: 6th battery group's master battery should setup as this.
1	1	1	7th: 7th battery group's master battery should setup as this.

Console

Console Communication Terminal: (RJ11 port) follow RS232 protocol (Baud Rate: 1200), for manufacturer or professional engineer to debug or service.

CAN

CAN Communication Terminal: (RJ45 port) follow CAN protocol (Baud Rate: 500K), for output batteries information.

RS485

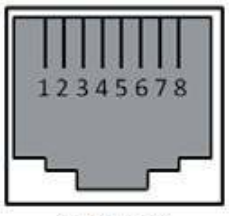
R485 Communication Terminal: (RJ45 port) follow RS485 protocol (Baud Rate: 9600 or115200), for output batteries information.

Link Port 0, 1

Link Port 0, 1 Communication Terminal: (RJ45 port) follow RS485 protocol, for communication between multiple parallel batteries.

Definition of RJ45 Port Pin

No.	RS485 Pin	CAN Pin
1	RS485 B	--
2	RS485 A	GND
3	--	--
4	--	CANH
5	--	CANL
6	GND	--
7	RS485A (recommend)	--
8	RS485B (recommend)	--

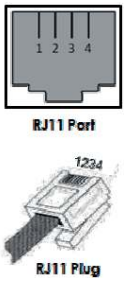


RJ45 Port

RJ45 Plug

Definition of RJ45 Port Pin

No.	RS232 Pin
1	GND
2	TXD
3	RXD
4	GND



Power Terminals

Power cable terminals: there are two pair of terminals with same function, one connect to equipment, the other one paralleling to other battery module for capacity expanding.

For each single module, each terminal can achieve charging and discharging function.

For power cables uses water-proofed connectors. It must keep pressing this Lock Button during pulling out the power plug.

Dry Contact Terminal

Dry Contact Terminal: provided 1 way input and 3 ways output dry contact signal.

LED Status Indicators

- RUN Lamp (No.6 Figure 2-1): green, long lighting when charging and flash when discharging.
- ALM Lamp (No.7 Figure 2-1 7): red, flashes when alarm and long bright if equipment failure or protected.
- Battery capacity indicator (No.8 Figure 2-1): 6 green lamps, each light represent 16.6% capacity.

LED Indicators Instructions

Condition	RUN	ALR	1	2	3	4	5	6
Power off	-	-	-	-	-	-	-	-
Power on	●	●	●	●	●	●	●	●
Idle/Normal	▮	-	-	-	-	-	-	-
Charge	●	-	Show soc; highest LED flash on: 0.5s; off 0.5s					
Discharge	▮	Show soc						
Alarm	ALR: ▮; Other LEDs are same as above							
System error/Protect	-	●	-	-	-	-	-	
● / ●	ON							
▮	Flash, on: 0.3s; off: 3.7s							
▮ / ▮	Flash, on: 0.5s; off: 1.5s							

BMS function:

Protection and Alarm	Management and Monitor
Charge/Discharge End	Cells Balance
Charge Over Voltage	Intelligent Charge Model
Charge/Discharge Over Current	Charge/Discharge Current Limit
High/Low Temperature (cell/BMS)	Capacity Retention Calculate
Short Circuit	Administrator Monitor
Power Cable Reverse	Operation Record

5. Trouble Shooting Steps

5.1 Problem determination based on:

1) Whether the battery can be turned on or not;
2) If battery is turned on, check the red light is off, flashing or lighting;
3) If the red light is off, check whether the battery can be charged/discharged or not.

5.2 Preliminary determination steps:

1) Battery cannot turn on, switch on the lights are all no lighting or flashing.
If the battery external switch is ON, the RUN light is flashing, and the external power supply voltage is 48V or more, the battery still unable to turn on, please contact distributor.

2) *The battery can be turned on, but red light is lighting, and cannot charge or discharge. If the red light is lighting, that means system is abnormal, please check values as following:*

a) Temperature: Above 50°C or under -10°C, the battery could not work.
Solution: to move battery to the normal operating temperature range between -10°C and 50°C.

b) Current: If current is greater than 100A, battery protection will turn on.
Solution: Check whether current is too large or not, if it is, to change the settings on power supply side.

c) High Voltage: If charging voltage above 54V, battery protection will turn on.
Solution: Check whether voltage is too high or not, if it is, to change the settings on power supply side.

d) Low Voltage: When the battery discharges to 44.5V or less, battery protection will turn on.
Solution: Charge the battery for some time, the red light turn off.
Excluding the four points above, if the faulty is still cannot be located, turn off power switch of the battery and repair.

5.3 The battery cannot be charged or discharged

1) Cannot be charged:
Disconnect the power cables, measure voltage on power side, if the voltage is 53~53.5V, restart the battery, connect the power cable and try again, if still not work, turn off battery and contact distributor.

2) Unable to discharge:
Disconnect the power cables and measure voltage on battery side, if it is < 44.5V, please charge the battery; if voltage is above 48V and still cannot discharge, turn off battery and contact distributor.

6. Emergency Situations

1) Leaking Batteries
If the battery pack leaks electrolyte, avoid contact with the leaking liquid or gas. If one is exposed to the leaked substance, immediately perform the actions described below.
Inhalation: Evacuate the contaminated area, and seek medical attention.
Contact with eyes: Rinse eyes with flowing water for 15 minutes, and seek medical attention.
Contact with skin: Wash the affected area thoroughly with soap and water, and seek medical attention.
Ingestion: Induce vomiting, and seek medical attention.

2) Fire
NO WATER! Only dry powder fire extinguisher can be used; if possible, move the battery pack to a safe area before it catches fire.

3) Wet Batteries
If the battery pack is wet or submerged in water, do not let people access it, and then contact Master Battery or an authorized dealer for technical support.

4) Damaged Batteries
Damaged batteries are dangerous and must be handled with the utmost care. They are not fit for use and may pose a danger to people or property. If the battery pack seems to be damaged, pack it in its original container, and then return it to Master Battery or an authorized dealer.

NOTE
Damaged batteries may leak electrolyte or produce flammable gas. If such damage occurs, please contact Master Battery: info@masterbattery.es