

Multi-application - LiFePO4 Power

CE **UE-48Li400**

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## LITHIUM IRON PHOSPHATE BATTERY



### 1. General Information

This specification defines the performance of rechargeable LiFePO4 battery pack **UE-48Li400** manufactured by UPOWER, S.L., describes the type, performance, technical characteristics, warning and caution of the battery pack.

### 2. Specification

NO.	Items	Description
<b>Normal Specification</b>		
1	Nominal Voltage	51.2V
2	Normal Capacity	400Ah
3	Internal Resistance	$\leq 20\text{m}\Omega$
4	System information Display & Communication	Display Battery voltage\current\SOC\ temperature through LCD with RS485
<b>Standard Charge</b>		
5	Battery operation temperature range @charging	0~45°C
6	Normal charge voltage	$58.4 \pm 0.4\text{V}$
7	Recommended float charge voltage (for Standby use)	$55.6 \pm 0.4\text{V}$
8	Allowed MAX charge current	250A @ Battery initial Temp $25 \pm 5^\circ\text{C}$
9	Recommended charge current	$\leq 100\text{A}$



NO.	Items	Description
<b>Standard Discharge</b>		
10	Battery operation temperature range @discharging	-20~60°C
11	Output Voltage Range	40~58.4V
12	Allowed discharge current	400A withstand 10min @Battery initial Temp 25±5°C
13	Peak discharge current	420A withstand 20s
14	Discharge Cut-off voltage	40V
<b>Mechanical Characteristics</b>		
15	Dimension	Length: 721±5mm
		Width: 403±5mm
		Height: 551.5±5mm
16	Weight	Approx.: 228±7Kg
<b>Storage</b>		
17	Storage Temperature & Humidity Range	Short: within one month -20~35°C, 45~75% RH
		Long term: above one month -10~30°C, 45~75% RH
18	Self-discharge rate	Residual capacity ≤3% per month; ≤15% per year
		Reversible capacity ≤1.5% per month; ≤8% per year



### 3. Electrical Characteristics & Test Condition

Testing Conditions: Ambient Temperature: 25±5°C; Humidity: 45%~75%.

NO.	Items	Criterion	Condition
1	Internal Impedance	≤20mΩ	Test the internal resistance of 50% SOC battery pack with 1 kHz AC internal resistance test instrument.
2	Capacity	≥392Ah	Rest for 1 hour after fully charged, then discharge with 0.33C current until the battery reaches the discharge cutoff voltage. Repeat above process for three times, if the discharge time is not less than 180 minutes, you can stop and define the Discharging current*time value (Ah) as battery capacity.
3	Short circuit protection	/	Not allowed.
4	MAX charge Current	250A	Charging with this current for more than 0.5h and the added temperature of battery pack less than 20°C.
5	MAX discharge Current	400A	Discharging with this current for more than 10min and the added temperature of battery pack less than 35°C.
6	Cycle life (DOD%100)	≥2500 cycles	Discharge with the current of 0.5C until it can't discharge, and then rest it for 1h. Charge the battery following CC (0.33C)/CV (14.6V) mode to full capacity, and then rest it for 1h. Repeat above process until full charged capacity is no more than 80% of normal value. Accumulated times is defined as cycle life.
7	Discharge Temperature Characteristics	-20°C	At 25±5°C discharge the battery with the current of 0.33C to the cut-off voltage. Store the battery at various temperatures for 2h and discharge the battery with 0.33C to the cut-off voltage. Record the ratio between discharging & charging capacity.
		0°C	
		25°C	
		55°C	
8	Charge Retention ability	Remain capacity ≥90%	Charge the battery to full capacity and store it for 28 days, and then discharge it with 0.33C to the cut-off voltage.



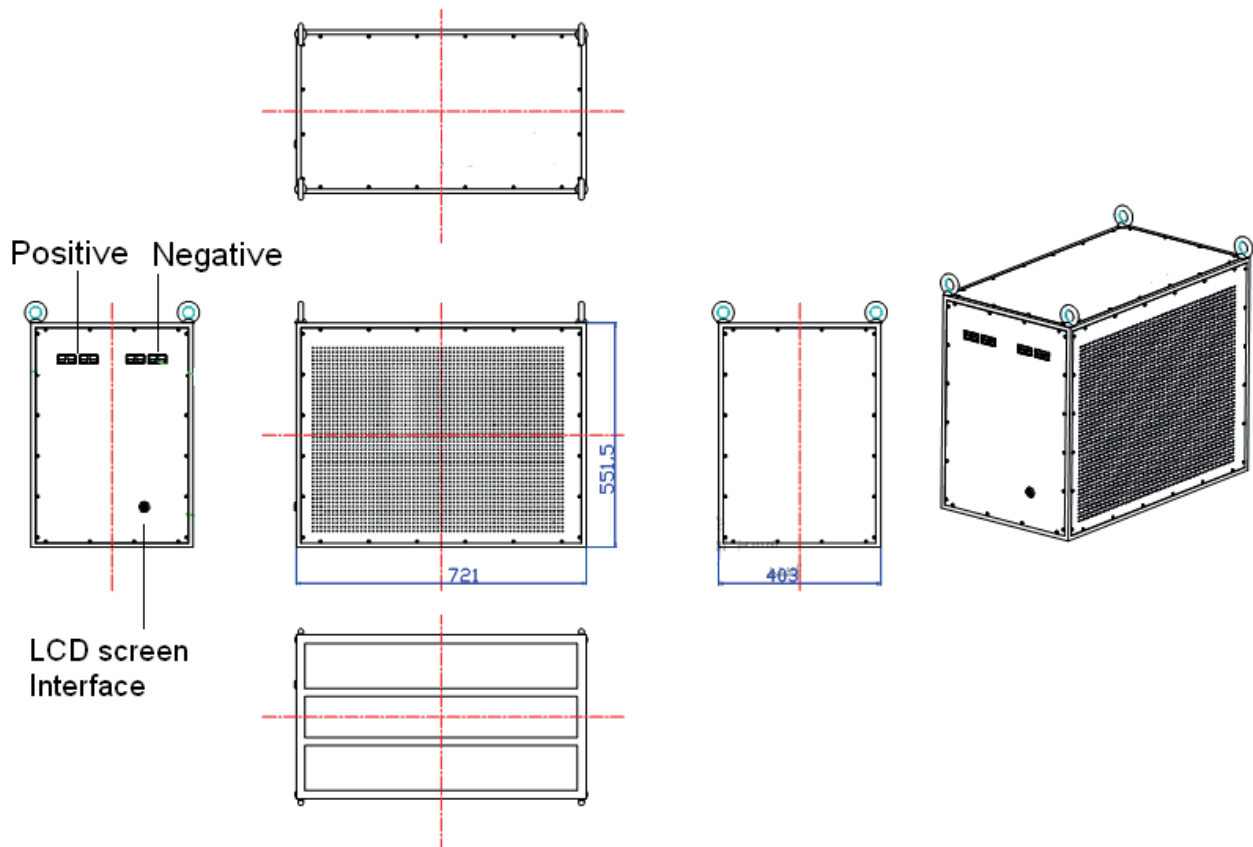
#### 4. Circuit Protection

The batteries are supplied with a LiFePO<sub>4</sub> Battery Management System (BMS) that can monitor and optimized each single prismatic cell during charge & discharge, to protect the battery pack overcharge, over discharge, short circuit. Overall, the BMS helps to ensure safe and accurate running.

Test Item	Content	Criterion
Over charge	Over-charge protection for each cell	$3.80 \pm 0.03V$
	Over-charge release for each cell	$3.60 \pm 0.05V$
	Over-charge release method	Under the release voltage
Over discharge	Over-discharge protection for each cell	$2.50 \pm 0.05V$
	Over-discharge release for each cell	$2.80 \pm 0.05V$
	Over-discharge release method	Charging
Over current	Discharge over current protection	420~500A
	Protection delay time	20~40ms
	Over current release method	Release after cutoff the load
Over & Lower Temperature	Battery over temperature	Protection @ $65 \pm 5^{\circ}C$
		Release @ $55 \pm 5^{\circ}C$
	Battery Lower temperature	Protection @ $-20 \pm 5^{\circ}C$
		Release @ $-10 \pm 15^{\circ}C$



## 5. Dimensional Drawing



## 6. Storage & Transportation

- Based on the character of cell, proper environment for transportation of LiFePO<sub>4</sub> battery pack need to be created to protect the battery.
- Battery should be stayed in the warehouse -20°C ~ 35°C where it's dry, clean, shade and well-ventilated.
- The battery should be stored in 50% SOC during transportation.
- The battery need to be charged every 6 months if out of use.
- Keep the battery against dropping, turning over and serious stacking during loading.



## 7. Warning & Tips

Please read and follow the specification and caution remarks on battery surface before use the battery. Improper use may cause heat, fire, rupture, damage or capacity deterioration of the battery. UPOWER, S.L. Describes is not responsible for any accidents caused by the usage without following our specification.

### Warning!

- The battery must be far away from heat source, high voltage and avoid to be exposed in sunshine for long time.
- Never throw the battery into water.
- Never connect the positive and negative of battery with metal.
- Never sheep or store battery together with metal.
- Never reverse two electrodes when use the battery.
- Never disassemble the battery without manufacturer's permission and guidance.
- Never knock, throw or trample the battery.

### Tips!

- Keep the battery against high temperature. Otherwise it will cause battery heat, get into fire or lose some function and reduce the life.
- When battery run out of power, please charge your battery timely ( $\leq 15$  day).
- Please use the matched or suggested charger for this battery.
- If battery emit peculiar smell, heating, distortion or appear any abnormity during working or storage, please stop using and take it out from device.
- If the battery leaks and get into the eyes or skin, do not wipe, instead, rinse it with clean water and see doctor immediately.
- Please far away from children or pets.
- Do not put disuse battery into a fire or water.
- If user needs to parallel several battery packs, please charge them to full capacity with same type of matched charger, and set it aside for 8 hours, professionals only. This battery pack supports application no more than 20 group parallel. If user needs to apply this product to more groups parallel, please reconfirm details with us.
- It is strictly prohibited any series between the battery packs. Any requirements on serials connection, please contact UPOWER for details.

