

USER GUIDELINE

LITHIUM IRON PHOSPHATE BATTERY

 <p>Danger High Voltage</p>	 <p>Safety glasses must be worn</p>		
<p>High Voltage!—Do not touch any terminals or connectors to avoid electric shock!</p>	<p>While working with Lithium Iron batteries, always wear protective clothing and eye glasses</p>	<p>Any uncovered battery material such as electrolyte or powder on skin or clothing must be flushed out with plenty of clean water immediately! Seek medical attention afterwards</p>	<p>Terminals of Lithium Iron phosphate batteries are always live, therefore do not place tools on them, do not short circuit or use outside of the specified electrical ratings</p>

Safety Precautions

- To protect all electrical equipment, circuit breakers, fuses, or disconnects should be utilized. They should all be appropriately sized by a certified electrician, licensed installers, or regional code authorities. The Renogy LFP contains a BMS that protects the cells from over-charge, over-discharge, and excessive load amperages, however this alone will not protect your system from severe electrical conditions.
- When connecting wiring, verify proper polarity positions. Never short circuit the battery! This can cause bursts of amperage which can irreversibly damage your system or battery and lead to possible explosion.
- Use safety clothing when installing the battery.
- Do **NOT** string this battery in series. It is made **ONLY for parallel connections using identical batteries.**
- Connecting the battery in series or parallel with another battery will result in **catastrophic failure.**

Note: Make sure to tightly screw the battery terminals in, having loose battery terminals will cause the terminals to build up heat resulting in damage to the battery.

Storing Batteries

- Batteries should be stored at room temperature, charged to about 30%-50% of capacity. It is recommended to charge the batteries once every three months to prevent over-discharge.
- Long periods of storage can deteriorate battery performance because of lack of use.

Standard Charge / Discharge

- Standard Charge shall consist of charging at **0.2C** constant current rate until the battery reaches 14.6V. The battery shall then be charged at a constant voltage of 14.6V while tapering the charge current. Charging will terminate when the charging current has tapered to a 0.02CA. Charge Time is approximately 7 hours. Safe Charging consists of temperatures between 32 °F and 113 °F.
- Battery Standard Discharge is constant current of **0.2C** to 10V.
- Charge batteries before use.

Battery Management System (BMS)

The BMS will protect and shut the battery down (0V) when it is over-discharged or short circuited. In these rare cases the user will need to activate the battery using an external device that has lithium battery activation feature. If the Lithium batteries voltage shows 0V the battery is not defective but in its protection setting. Please contact our Tech Support team at 909-287-7100 for any questions about the BMS.

Installation

Safe and reliable installation requires trained and certified technicians. Therefore, the purpose of this section is to serve as a guideline as all scenarios cannot be covered. Each battery used must be protected by a fuse, circuit breaker, or disconnect. This battery cannot be placed in series connection only parallel connections.

1. Wear safety clothing and eyewear protection
2. Use appropriate and heavy gauge wiring

Use high stranded copper and heavy gauged wiring to handle possible loads from the battery. Make sure to maintain identical wire lengths.

3. Verify correct polarity

Reverse polarity can and will destroy your battery. Make sure to use a multi-meter to determine proper polarity.

4. Make sure to tightly screw the battery terminals in

Failure to not make a tight connection could result in overheating and problems in your battery.

5. Store the battery in ventilated area

Specification

Electric Characteristics	Nominal Voltage	12.8V	12.8V	12.8V
	Rated Capacity (0.2C)	50Ah	100Ah	170Ah
	Minimal Rated Capacity (0.2C)	47.5Ah	95Ah	165Ah
	Energy	640Wh	1280Wh	2176Wh
	Specific Energy	95.5Wh/kg	100.4Wh/kg	103.6Wh/kg
	Energy Density	114.4Wh/L	126.7Wh/L	149.1Wh/L
	Internal Resistance	$\leq 30\text{m}\Omega$	$\leq 30\text{m}\Omega$	$\leq 30\text{m}\Omega$
	Cycle Life (0.2C, 20 \pm 5 $^{\circ}$ C)	100% DOD 2000 cycles	100% DOD 2000 cycles	100% DOD 1500 cycles
Charging Parameters	Charge Voltage	14.4 \pm 0.2V	14.4 \pm 0.2V	14.4 \pm 0.2V
	Maximum Charge Current	50A	50A	50A
	Charge Cut-off Voltage	14.6V	14.6V	14.6V
	Maximum Continuous Discharge Current	50A	100A	100A

Discharging Parameters	Discharge Cut-off Voltage		≥10V	≥10V	≥10V
Temperature Parameters	Operation Temperature Range (60±25% R.H.)	Charge	0~45°C	0~45°C	0~45°C
		Discharge	-20~60°C	-20~60°C	-10~50°C
		Recommended	23±5°C	23±5°C	23±5°C
	Storage Temperature Range (60±25% R.H.)	Less than 1 year	0~25°C	0~25°C	0~25°C
		Less than 3 months	-5~35°C	-10~35°C	-5~35°C
Mechanical Properties	Dimensions	Length	197±3mm	260±3mm	347±3mm
		Width	166±3mm	158±3mm	155±3mm
		Height	171±3mm	246±3mm	270±3mm
	Weight		6.7kg	12.75kg	21kg
	Housing Material		ABS+PC	ABS+PC	ABS+PC
	Terminal Model		M8×20mm	M8×20mm	M12×14mm
	Cell Model		IFR26650-3.4AH	IFR26650-3.4AH	IFR26650-3.4AH
	Assembly Method		4S15P	4S31P	4S53P

Specification of Protection Circuit Module

Overvoltage Protection	Protection Voltage (Single Cell)		3.80±0.05V
	Delay Time		0.5~2s
	Recovery Voltage (Single Cell)		3.50±0.05V
Under voltage Protection	Protection Voltage (Single Cell)		2.30±0.05V
	Recovery Voltage (Single Cell)		2.60±0.05V
Overcurrent Protection	Protection Current		150A
	Recovery Mechanism		Disconnect Load
Short-circuit Protection	Trigger Mechanism		External Short-circuit
	Delay Time		100~400μs
	Recovery Mechanism		Disconnect Load
Over-temperature Protection	Charge	Protection Temperature	60°C
		Recovery Temperature	50°C
	Discharge	Protection Temperature	65°C
		Recovery Temperature	55°C

