





# USER GUIDELINE

## LITHIUM IRON PHOSPHATE BATTERY

 <p><b>Danger</b> High Voltage</p>	 <p><b>Eye Protection</b> Must Be Worn</p>	 <p><b>Emergency</b> Eye Wash</p>	 <p><b>Caution</b> Risk Of Fire Highly Flammable Material</p>
<p>DO NOT touch any terminals or connectors to avoid electric shock.</p>	<p>ALWAYS wear protective clothing and eyeglasses while working with the Lithium Iron Phosphate Battery.</p>	<p>Any uncovered battery material such as electrolyte or powder on the skin or in the eyes must be flushed out with plenty of clean water immediately. Seek medical attention afterwards. Spillages on clothing should be rinsed out with water.</p>	<p>Terminals of the Lithium Iron Phosphate Battery are always live. DO NOT place tools on them. DO NOT short circuit or use outside of the specified electrical ratings.</p>

### Safety Precautions

- Please use circuit breakers, fuses, or disconnects that are appropriately sized by certified electricians, licensed installers, or regional code authorities to protect all the electrical equipment in your system. The battery contains a battery management system (BMS) that protects the battery cells from over-charge, over-discharge, and over-current, however this alone will not protect your system from severe electrical conditions.
- Please verify the polarity before connecting wiring. Reverse polarity can and will destroy the battery.
- DO NOT short-circuit the battery terminals. Doing so can cause bursts in amperage and lead to irreversible damage to the system and the battery (and possibly cause an explosion).
- Please wear proper personal protective equipment when working on the battery.
- DO NOT string batteries in series. Doing so can cause catastrophic failure.
- Please ONLY connect identical batteries in parallel to ensure the best battery performance.
- If the battery shuts off due to low state of charge, please disconnect the battery from your equipment to eliminate parasitic loads and charge the battery as soon as possible.
- It is highly recommended to pair the battery with low voltage disconnect devices in the system setup.

## Battery Installation

Safe and reliable installation requires trained and certified technicians. This section can only serve as a guideline as all scenarios cannot be covered.

- **Wear protective clothing and eyeglasses**

- **Size the battery cables appropriately**

Use high stranded copper and heavy gauge cables to handle possible loads from the battery. Make sure to maintain identical cable lengths.

- **Verify correct polarity**

Reverse polarity can and will destroy the battery. Use a multimeter to determine proper polarity.

- **Tighten the cable connections**

Over-tightening cable connections can cause terminal breakage and loose cable connections can cause terminal meltdown or fire.

- **Place the battery in a well-ventilated area**

## Battery Operation

- Depending on shipping times and the time since manufacture, the battery may be received at a partial state of charge. Please fully charge the battery prior to the first use.

- Standard charging consists of charging at 0.2C constant current until the battery reaches 29.0V. The battery is then charged at a constant voltage of 29.0V while tapering the charging current. Charging is considered complete when the charging current has tapered to 0.05C. Safe charging requires temperatures between 0°C and 55°C (32°F and 131°F) and takes approximately 5.5 hours.

- For standard discharging, the battery is discharged at 0.2C constant current until the battery reaches 20V. Safe discharging requires temperatures between -20°C and 60°C (-4°F and 131°F).

## Battery Storage

- Please charge the battery to 30%~50% and store the battery in an open, well-ventilated, dry, clean area with temperatures of around 23°C (73.4°F).

- Long periods of storage can deteriorate the battery performance. It is recommended to charge the battery at least once every three months to prevent over-discharge.

## Battery Management System (BMS)

The BMS will protect and shut the battery down when it is over-discharged or short circuited. In these rare cases, the battery will show 0V voltage. Please activate the battery using an external charging source that has lithium battery activation function. Please contact our Tech Support team at (909)287-7111 for more information about the BMS.

## Battery Specifications

Model		RBT2450LFP	
Electric Characteristics	Nominal Voltage	25.6V	
	Rated Capacity (0.2C)	50Ah	
	Energy	1280Wh	
	Specific Energy	100.78Wh/kg	
	Internal Resistance	≤20mΩ	
	Cycle Life	> 3500 Cycles (25°C, 0.2C, DOD 80%, EOL 80%)	
Charging Parameters	Charge Voltage	29±0.2V	
	Maximum Continuous Charge Current	50A	
	Charge Cut-off voltage	29.2V	
Discharging Parameters	Maximum Continuous Discharge Current	50A	
	Discharge Cut-off Voltage	20V	
Temperature Parameters	Operation Temperature Range (60±25% R.H.)	Charge	0~55°C/32~131°F
		Discharge	-20~60°C /-4~140°F
		Recommended	23±5°C/73.4±9°F
	Storage Temperature Range (60±25% R.H.)		-25~65°C /-13~149°F
Mechanical Properties	Dimensions	Length	330mm/13.0inch
		Width	172mm/6.8inch
		Height	214mm/8.4inch
	Weight		12.7kg/28.0lbs
	Housing Material		ABS (Flame Retardant Plastic)
	Terminal Model		M8 x 1.25 x 15mm
	Assembly Method		8S1P

## Protection Circuit Module (PCM) Specifications

Battery Operation Status		Condition	
Battery Overvoltage	Protection	Trigger	Battery Voltage $\geq$ 29.2V
		Recover	Battery Voltage $\leq$ 27.6V / Discharge current $\geq$ 1A
Battery Cell Overvoltage	Protection	Trigger	Battery Cell Voltage $\geq$ 3.65V
		Recover	Battery Cell Voltage $\leq$ 3.45V / Discharge current $\geq$ 1A
Battery Undervoltage	Protection	Trigger	Battery Voltage $\leq$ 20V
		Recover	Battery Voltage $\geq$ 22.4V / Charge current $\geq$ 1A
Battery Cell Undervoltage	Protection	Trigger	Battery Cell Voltage $\leq$ 2.5V
		Recover	Battery Cell Voltage $\geq$ 2.8V / Charge current $\geq$ 1A
Charge High Temperature	Protection	Trigger	Battery Temperature $\geq$ 131°C (55°F)
		Recover	Battery Temperature $\leq$ 113°C (45°F)
Discharge High Temperature	Protection	Trigger	Battery Temperature $\geq$ 140°C (60°F)
		Recover	Battery Temperature $\leq$ 122°C (50°F)
Charge Low Temperature	Protection	Trigger	Battery Temperature $\leq$ 32°C (0°F)
		Recover	Battery Temperature $\geq$ 41°C (5°F)
Discharge Low Temperature	Protection	Trigger	Battery Temperature $\leq$ -4°C (-20°F)
		Recover	Battery Temperature $\geq$ -5°C (-15°F)
Charge Overcurrent	Protection	Trigger	Charge Current $\geq$ 55A (Delay 15s)
		Recover	(Delay 1min)
Discharge Overcurrent	Primary Protection	Trigger	Discharge Current $\geq$ 55A (Delay 15s)
		Recover	(Delay 1min)
	Secondary Protection	Trigger	Discharge Current $\geq$ 60A (Delay 250ms)
		Recover	(Delay 1min)
Short circuit	Protection	Trigger	Discharge Current $\geq$ 1000A
		Recover	Remove Short Circuit (300 $\mu$ s)