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Version: March 06, 2024, LiFePO<sub>4</sub> Batteries for Aerial Work Platforms



# LiFePO<sub>4</sub> Batteries

## for Aerial Work Platforms

Drop-in Lithium-ion  
for Lead-acid  
Alternatives



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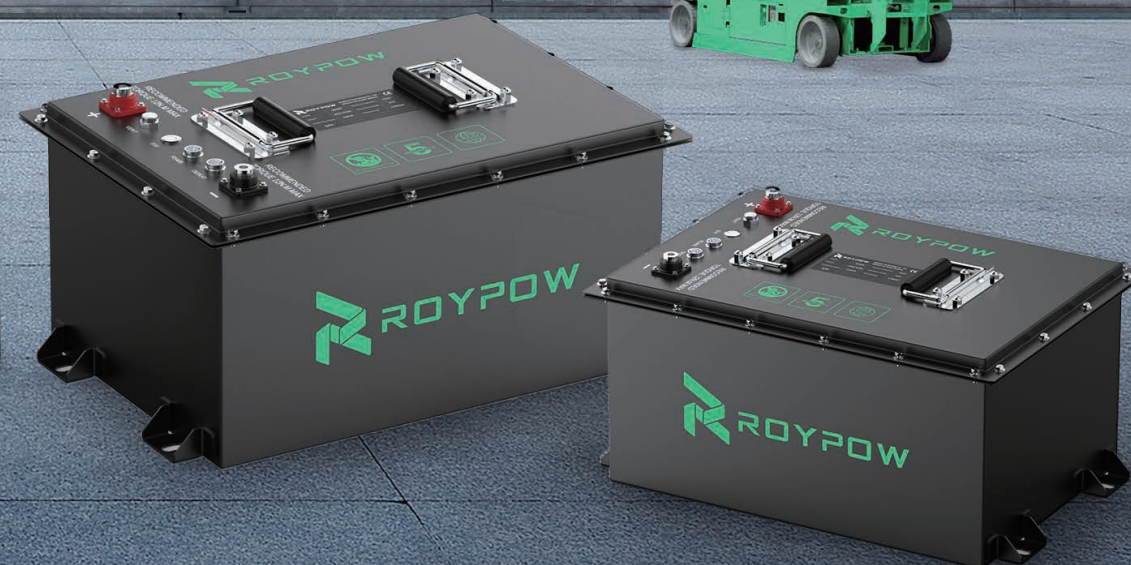
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# New Technology. Create Great Value for Your Business







Converting from lead-acid to lithium-ion is easy and cost-effective and increases the productivity of the fleets and the operator.

Retrofit Your Fleet to Lithium-ion Batteries.



## Benefits of Lithium-ion Batteries

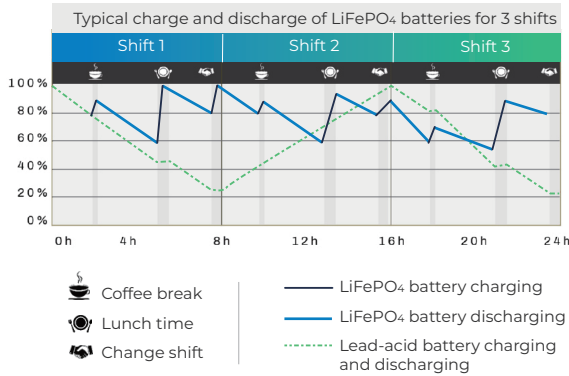


Lead-acid	LiFePO4 battery	
 3 years design life	 up to 10 years design life <b>Longer life</b> 3 to 4 times lead-acid lifespan	<ul style="list-style-type: none"> <li>✓ Reduces overall battery investment</li> <li>✓ Eco-friendly</li> <li>✓ Minimize the need for spares</li> </ul>
 Frequent maintenance	 <b>0 maintenance</b> no need for regular filling of distilled water and electrolyte No maintenance	<ul style="list-style-type: none"> <li>✓ No regular filling of distilled water</li> <li>✓ Saving costs on labor and maintenance</li> <li>✓ Less unplanned downtime and improved productivity</li> <li>✓ No frequent battery replacements</li> </ul>
 1-2 years warranty	 <b>Extended warranty</b> bring you peace of mind 5 years warranty	<ul style="list-style-type: none"> <li>✓ Durable and reliable</li> <li>✓ Reduces maintenance and labor costs</li> <li>✓ Quality guarantee</li> </ul>

## Reduce Downtime, Increase Equipment Availability

In day-to-day operations, the battery can be charged even during short breaks, such as taking a rest or changing shifts, effectively increasing productivity.

- ✓ Reduces the need for a full charge every time.
- ✓ Eliminates the need for frequent time-consuming battery swaps.
- ✓ Eliminates the risk of battery-changing accidents.
- ✓ Opportunity charge during breaks, lunch and at shift changes. Charge anytime equipment is not in use.



## Rapid Charging

Whether you have a single-shift or a large fleet working 24/7, fast charge is one of the most important advantages.



TIPS

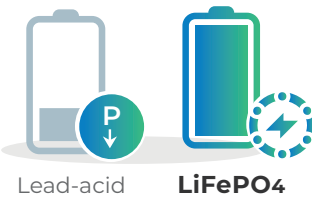
### Why choose LiFePO<sub>4</sub> batteries for Aerial Work Platforms?

There are a few lithium-ion chemistries to choose from. ROYPOW uses LFP or Lithium Iron Phosphate, one of the most thermally stable and safe lithium-ion chemistries for Aerial Work Platforms.

LFP offers longer life, is more energy-dense, more stable, is more compact, and weighs less than lead-acid. Our battery packs are sealed units requiring no daily or weekly watering and no maintenance. LFP is ideal for batteries used in Aerial Work Platforms.

## Consistent Power

Lithium-ion batteries deliver consistently high performance, which maintains greater productivity even toward the end of a shift.



## Eliminate the Need for a Dedicated Charging Area and Frequent Battery Swaps

- ✓ Minimize the need to buy, store and maintain spares.
- ✓ Eliminate the cost and storage space required for additional lead-acid batteries.
- ✓ No gassing, no ventilation system needed when charging. No hazardous acid spills.





# Small Investment, Big Return

Converting your battery to lithium-ion may require a higher initial investment, but its ongoing savings on energy, equipment, labour and downtime can give you a more cost-effective bill in opposite.

## The LiFePO<sub>4</sub> batteries can offer you...









- ✓ Longer life reduces overall battery investment.
- ✓ No maintenance saves labor and maintenance costs.
- ✓ No gas or acid spills, avoids the space, equipment and running costs of a battery room and ventilation system.
- ✓ Energy saving and less downtime, improve productivity.



## 5-year Cost Comparison to Increase Your Overall Return on Investments.

Save Up to **70%**  
Expenses in 5 Years

Below is the 5-year expenditure table comparing ROYPOW LiFePO<sub>4</sub> batteries with lead-acid batteries.

Purchases over 5 Years	Lead-acid Battery	LiFePO <sub>4</sub> Battery
Battery cost	 5yr	
Maintenance	 5yr	/
Electricity waste	 5yr	/
Installation	 5yr	
Shipping	 5yr	

Remark: Actual costs may vary according to local conditions.

# ROYPOW Batteries with Smart & Integrated Systems

Provide exceptional performance to get the job done and improve your productivity, which means fewer hours of unplanned downtime and more productive hours on your work.

0 Maintenance  
Up to **3,500+** Cycle Life

5<sub>yr</sub> Warranty  
Up to **10**<sub>yr</sub> Design Life



## Durable

ROYPOW batteries have an IP65 ingress rating. They will provide fast lifting and travel speeds at all levels of discharge, under all-weather working conditions.

## Inbuilt Protection

Intelligent BMS is for automatic cell balancing and advanced battery management. The LiFePO<sub>4</sub> batteries have greater thermal and chemical stability.



# Reliable Power for Most Aerial Lift Brands

ROYPOW lithium-ion batteries deliver consistent, reliable power for Aerial Lifts.



Advanced battery solution for most leading brands of aerial work platforms. They can be generally applied in these famous aerial work platform brands:

Zoomlion	Genie	Mantall	Noble
Xcmg	JLG	Runshare	Eastmanhm
Dingli	Sunward	Skyjack	Airman
LGMG	Sany	Manitou	Sivge
Sinoboom	Haulotte	Emis	More>
Snorkel/Xtreme	LiuGong		

Disclaimer: The information above is intended only to describe that products of ROYPOW are applicable to products of brands above under specific circumstances. It should not be regarded as any illegal use of third-party brands and trademarks. You should not infer that RoyPow has established or has any agency, employment, partnership or joint venture relationship with the companies above.

# Which LiFePO<sub>4</sub> Battery is Suitable for Your Aerial Work Platforms?

One Stop for All of Your Battery Needs!

We make 24, 48, and 72 volt systems to cover small and large platform Electric Scissor Lifts:

## Small-platform

### 24 V Battery System

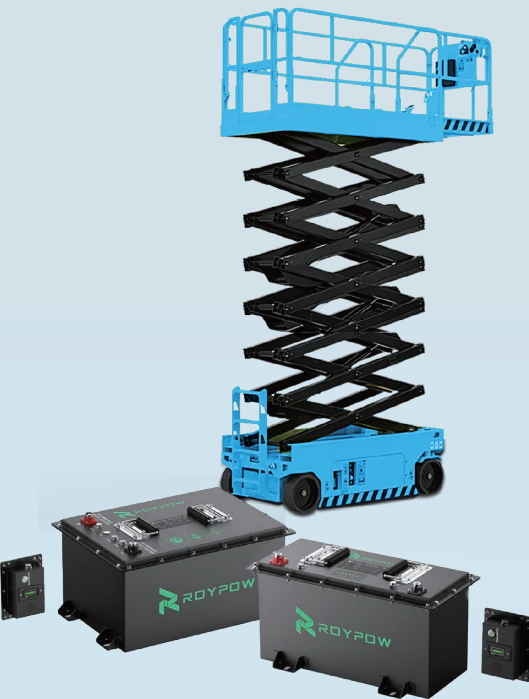
For small-platform electric scissor lifts



## Large-platform

### 48 V / 72 V Battery System

For large-platform electric scissor lifts

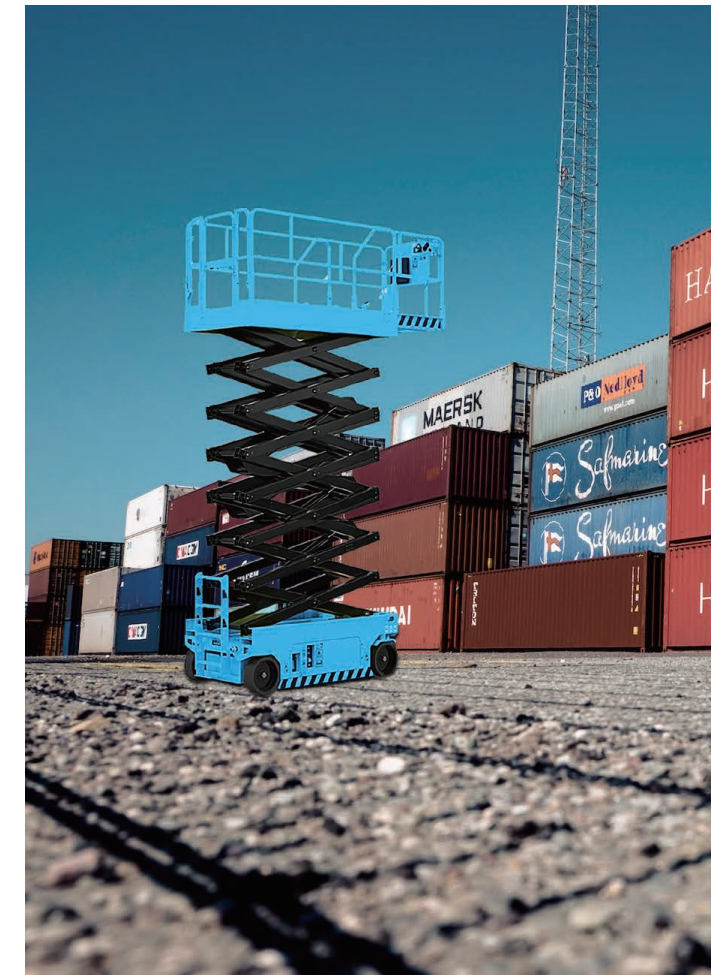
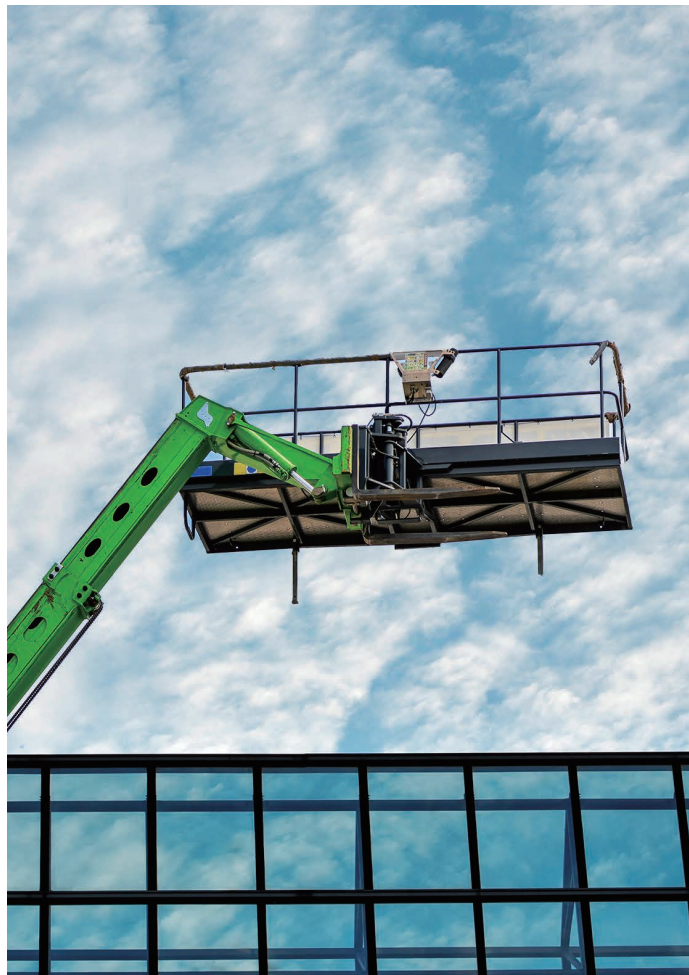




# LiFePO<sub>4</sub> Batteries for Aerial Work Platforms

Switch to new technology, lithium drop-in replacements for lead-acid batteries.

- ✓ A full range of lithium-ion battery to power your aerial lifts.
- ✓ Maximum uptime and flexible lifting.



## An Ideal Lithium-ion Solution

### Efficient

- ✓ High, consistent performance without the voltage drop at the end of the cycle.
- ✓ Reduce unplanned downtime with fast, efficient, opportunity charging.
- ✓ 10 years design life - a worthwhile upgrade.

### Flexible and Worry-free

- ✓ Zero maintenance, no need for water top-ups or electrolyte checks.
- ✓ No battery swapping, reduce related accidents and resulting employee injuries.
- ✓ No need for specific charging room.

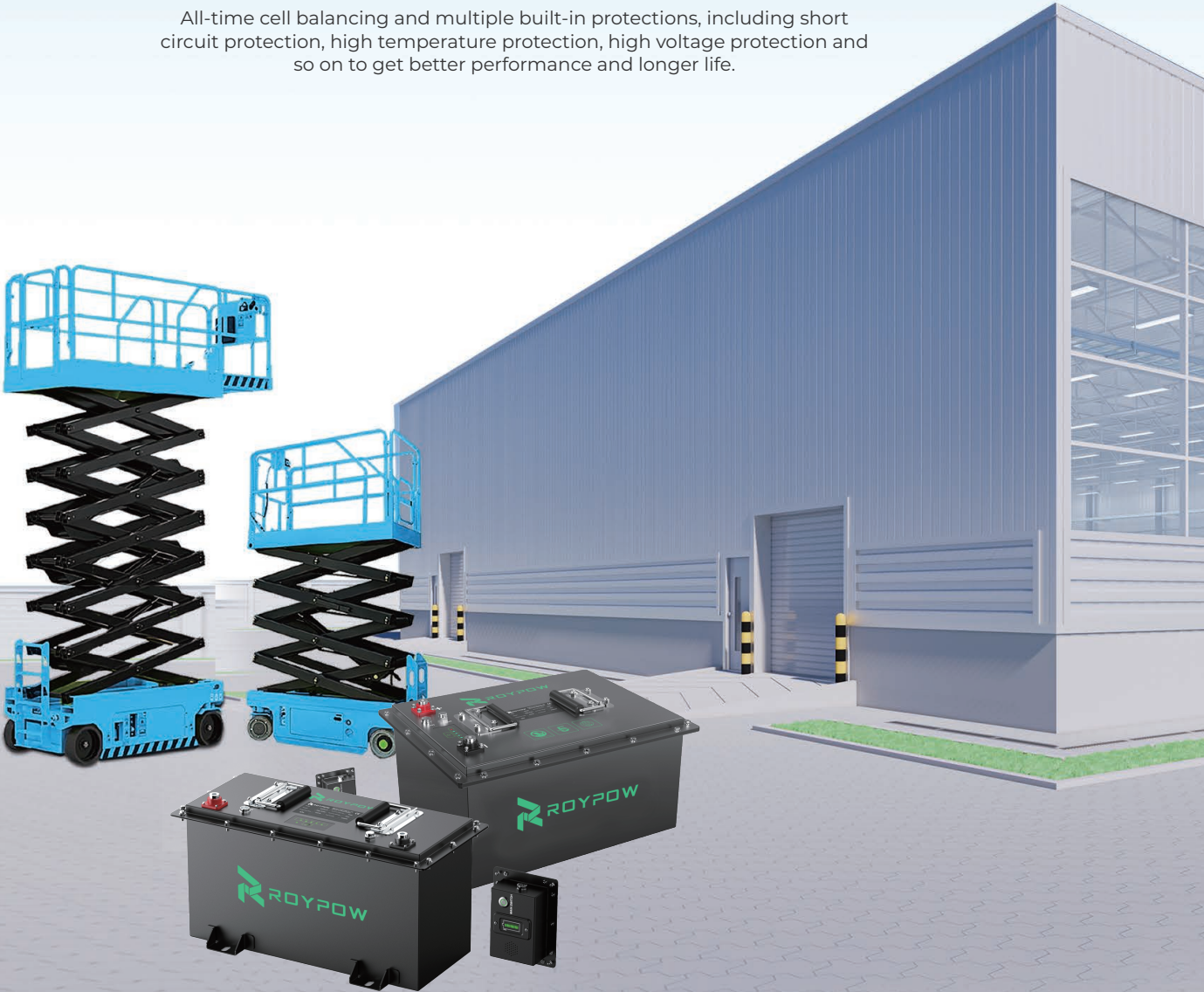
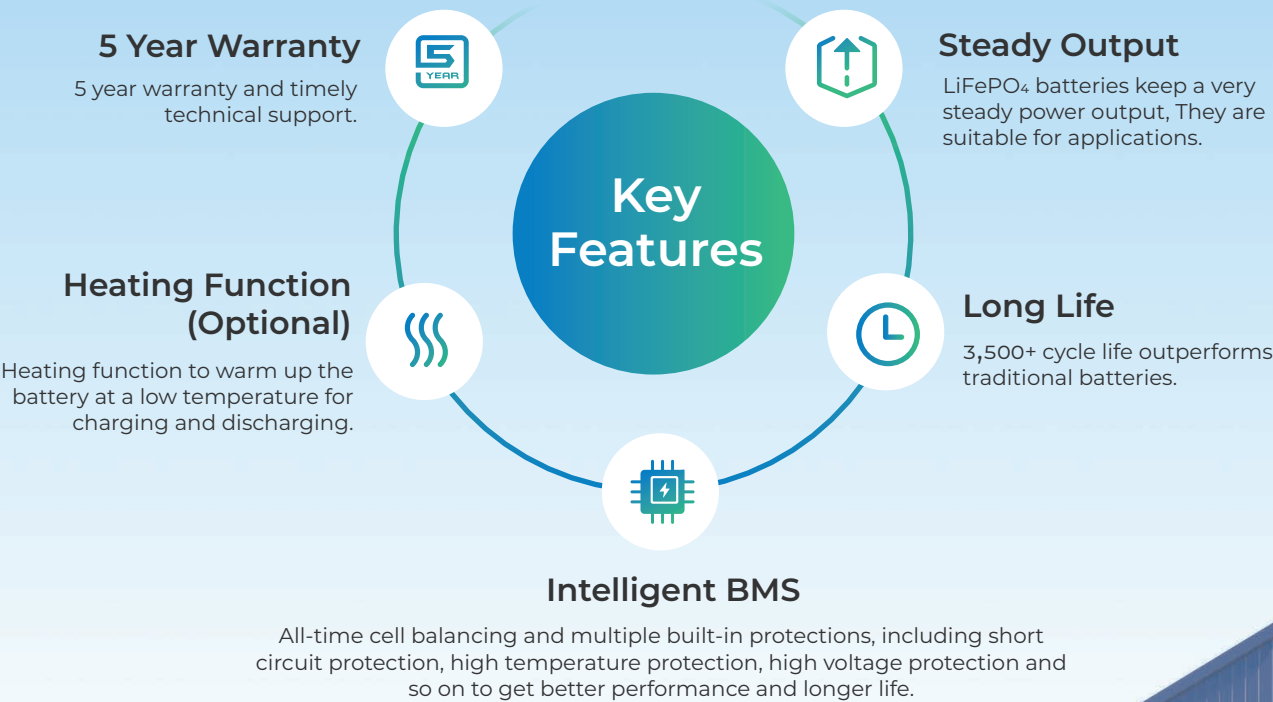
### Green and Stable

- ✓ No acid spills, no noxious gas emissions.
- ✓ More thermal & chemical stability.
- ✓ Good for you and the planet.





Why ROYPOW LiFePO<sub>4</sub> Batteries



Specifications



Technical Specifications							Discharge Current		General	
Model	Nominal Voltage	Nominal Capacity	Stored Energy	Cycle Life	Dimensions (L*W*H)	Weight lbs. (kg)	Continuous Discharge	Maximum Discharge	Casing Material	IP Rating
24 V System										
S24105C-D (with heating)	25.6 V	105 Ah	2.69 kWh	>3,500 times	13.8×9.8×10.3 inch (350×250×262 mm)	56 lbs. (25.6 kg)	120 A	180 A (20 S)	Steel	IP67
S24105C-F (with heating)		105 Ah	2.69 kWh		17.6×9.6×10.5 inch (448×244×267 mm)	60 lbs. (27 kg)	120 A	180 A (20 S)		IP67
S24120A (with heating)		120 Ah	3.07 kWh		20.39×7.28×9.84 inch (518×185×250 mm)	66.14 lbs. (30 kg)	120 A	250 A (30 S)		IP54
S24160B (with heating)		160 Ah	4.09 kWh		20.6×14.2×10.5 inch (524×360×267 mm)	90.39 lbs. (41 kg)	150 A	250 A (30 S)		IP67
S24160B-A (with heating)		160 Ah	4.09 kWh		20.0×14.2×10.5 inch (504×360×267 mm)	90.39 lbs. (41 kg)	150 A	250 A (30 S)		IP67
S24160B-B (with heating)		160 Ah	4.09 kWh		15.75×12.99×10.24 inch (440×330×260 mm)	84 lbs. (38 kg)	150 A	250 A (30 S)		IP67
S24160G (with heating)		160 Ah	4.09 kWh		20.6×14.2×10.5 inch (517×257×260 mm)	84 lbs. (38 kg)	150 A	250 A (30 S)		IP67
S24210B (with heating)		210 Ah	5.38 kWh		19.2×13.8×10.3 inch (488×350×261 mm)	105 lbs. (47.8 kg)	150 A	250 A (30 S)		IP67
S24210C		210 Ah	5.38 kWh		28.0×10.2×10.5 inch (712×260×267mm)	100 lbs. (45kg)	150 A	250 A (30 S)		IP67
S24210D (with heating)		210 Ah	5.38 kWh		28.0×10.2×10.5 inch (712×260×267mm)	100 lbs. (45kg)	150 A	250 A (30 S)		IP67
S24210P-E (with heating)		210 Ah	5.38 kWh		20.6×14.2×10.5 inch (524×360×267 mm)	102 lbs. (46kg)	210 A	350 A (30 S)		IP67
S24420A (with heating)		420 Ah	10.75 kWh		26.0×17.4×15.1 inch (660×443×383mm)	243 lbs. (110 kg)	210 A	350 A (30 S)		IP67
48 V System										
S51105B-A (with heating)	51.2 V	105 Ah	5.38 kWh	>3,500 times	20.6×14.2×10.3 inch (524×360×267 mm)	105 lbs. (47.8 kg)	150 A	250 A (30 S)	Steel	IP67
S51210C (with heating)		210 Ah	10.75 kWh		20.6×14.2×10.5 inch (A/B BOX) (524×360×267 mm A/B BOX)	212 lbs. (96 kg)	200 A	350 A (30 S)		IP67
S48230A (with heating)		210 Ah	11.04 kWh		22.13×16.73×15.28 inch (562*425*388 mm)	205 lbs. (93 kg)	200 A	350 A (30 S)		IP67
S51230B (with heating)		230 Ah	11.78 kWh		23.4×11.69×10.9 inch (A/B BOX) (597×297×277 mm A/B BOX)	220 lbs. (100 kg)	200 A	350 A (30 S)		IP67
S51280C (with heating)		280 Ah	14.34 kWh		28.0×10.8×10.8 inch (A/B BOX) (712×275×275 mm A/B BOX)	243 lbs. (110 kg)	250 A	350 A (30 S)		IP67
72 V System										
S72280A (with heating)	76.8 V	280 Ah	21.54 kWh		29.52×13.78×13.7 inch (A/B BOX) (750×350×348 mm A/B BOX)	105 lbs. (47.8 kg)	250 A	350 A (30 S)	Steel	IP67
Working Temperature Range		Charge -4°F~131°F ( -20°C ~ 55°C)		Discharge -4°F~131°F ( -20°C ~ 55°C)		Storage ( 1 month ) -4°F~131°F ( -20°C ~ 55°C)		Storage ( 1 year ) 32°F~95°F ( 0°C~35°C)		

1. All pictures shown are for reference only and data are based on ROYPOW standard test procedures.  
2. Actual performance may vary according to local conditions. Only authorized personnel are allowed to operate or make adjustments to the batteries.  
3. We reserve the right to make revisions as well as product alterations and improvements at any time without prior notice.





# More about ROYPOW Lithium-ion Batteries



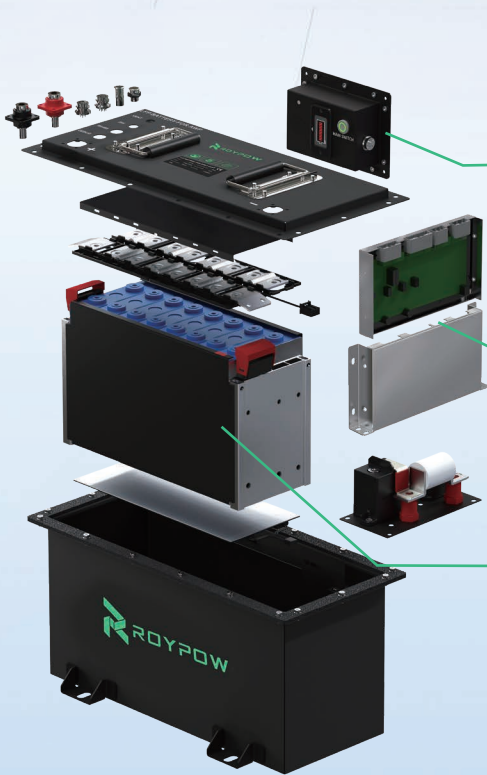
Quality and safety always come first. Except those benefits, we also have intelligent design from our professional R&D team.

Maintenance free

Fast charge

Long life

Ultra safe



## Intelligent design

- Control panel included**  
Showing all critical battery functions in real-time, voltage, current, and remaining charging time and fault alarm.
- Built-in BMS**  
For cell balancing and advanced battery management.
- Battery pack module**  
Using LiFePO<sub>4</sub> cells to insure stable and safe battery performance.

## Battery management system (BMS)

The built-in BMS is equipped with automotive-grade components assuring safe, top quality and high energy density. To provide a fully optimized solution for demanding industrial applications. BMS software ensures the battery to provide peak performance when in operation, to deliver longer run time between charges, to maximize the total battery lifespan and to communicate well between the charger, battery and users.

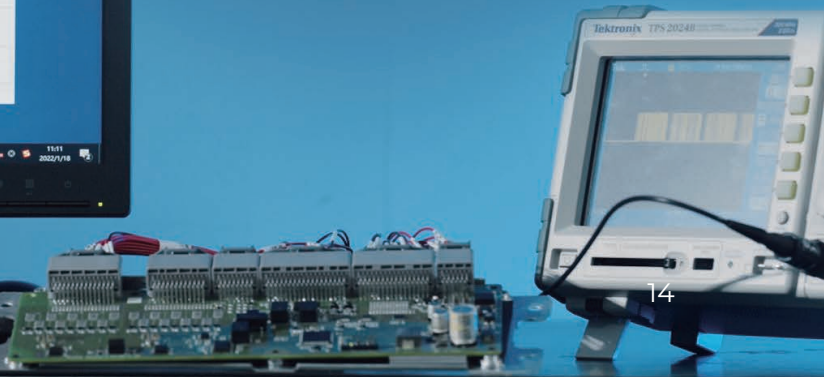
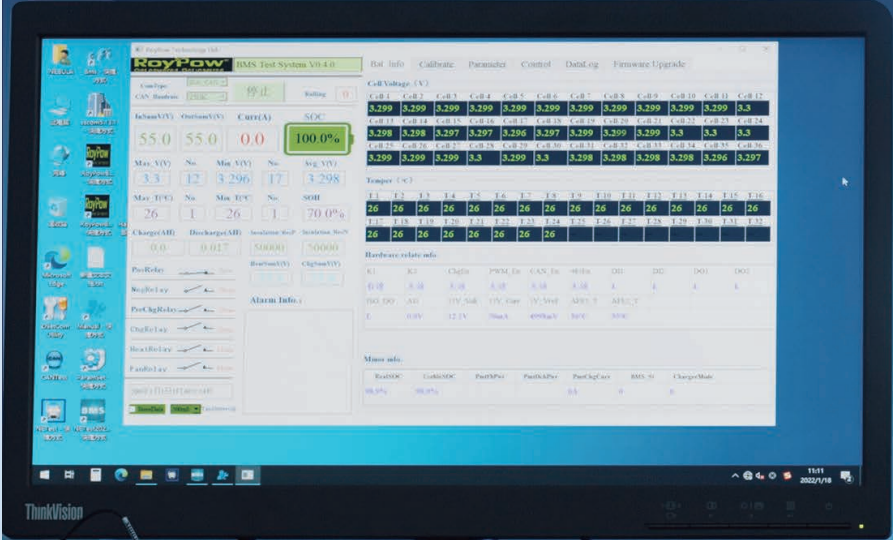


### The BMS can offer:

- All-time cell balancing and battery management.**  
Through the intelligent balancing strategy, balancing between individual cells can be realized. The BMS can keep the battery's consistency at all times when in operation, maximizing the battery efficiency and improve the battery's working life.

- Battery real-time monitoring and communication through CAN.**  
Monitoring cell voltage, electric current and battery temperature, so that any movement outside of normal range disconnects the cell or the entire battery.

- Fault alarm and safety protection.**  
When the battery is less than 10%, it will beep to prompt for charging in case of stopping somewhere far away from charge station suddenly without notice. Over/under voltage, low/over temperature, over current or other faults will prompt to make the battery safe. Safety always comes first.





# Original Charger for Aerial Work Platforms

ROYPOW has developed chargers specifically for each type of lithium batteries to deliver the optimal battery performance, safeguard the driving experience, and keep the best communication between our LiFePO<sub>4</sub> batteries and the chargers.



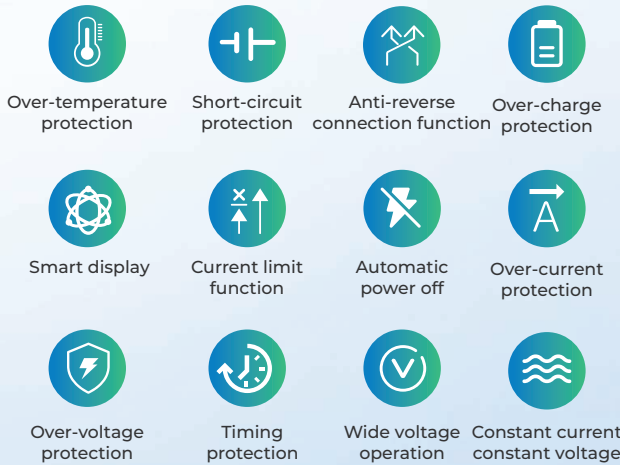
## Intelligent Charging Management

To use the ROYPOW charger, the battery management system (BMS) can control the charging current according to different temperatures and SOC of the batteries.

ROYPOW's intelligent BMS ensures the safety of the battery and improves the charging efficiency.

When the battery is at a low voltage, the battery can be charged at low current to ensure battery safety.

When the battery is less than 10%, it will beep to prompt for charging.



### Anti-walking Function

During the charging process, without disconnecting the plug, the equipment cannot be started.

### Waterproof

Get rid of the AC adapter to realise the real IP66 rate, no need to worry about water or debris like dirt or mud.

### Natural Cooling

It is sealed but with a natural cooling function without a fan for better heat dissipation capacity and to extend the lifespan.

Smart,  
Durable and  
Efficient

### Safe Charging

Advanced charge algorithm ensures the batteries to be charged correctly and safely.

### Corrosion Protection & Vibration Resistance

Aluminum alloy design with the one-body forming technology which is more corrosion protection and vibration resistance.

### Intelligent Protection

With the advanced technology of arc resistance hot-swap to keep the charger safe and extend its lifespan.

## Compatibility

TIPS

Our chargers are compatible with the voltages in most countries and regions. And it's applied to cater to various charge modes and the multiple AC plugs for choices.

### Single phase:

China 220V 50Hz    America 120V 60Hz  
Europe 230V 50Hz    Japan 100V 50Hz/60Hz



### AC input port

can be compatible with plugs from different countries.



### DC output port

is configured as ROYPOW exclusive charging adaptor.



LED display

Charger program upgrade USB port

AC input port



DC output

Anti-movement wire harness port

ROYPOW charging base





# ROYPOW, For One-stop New Energy Solutions

ROYPOW TECHNOLOGY is dedicated to the R&D, manufacturing and sales of motive power systems and energy storage systems as one-stop solutions.

With more than 20 years of combined experience in manufacturing renewable energy and battery systems, ROYPOW provides Lithium-ion Batteries covering most daily living and working fields: for Low-Speed Vehicles such as golf carts, personnel carriers; Industrial Batteries for use in Material Handling Equipment such as forklifts, aerial work platforms and floor cleaning machines as well as renewable Energy Storage Systems for residential, commercial, industrial, vehicle-mounted and marine applications.

ROYPOW has established a worldwide network to serve customers with a manufacturing center in China and subsidiaries in the USA, the UK, Germany, the Netherlands, South Africa, Australia, Japan and Korea to date. ROYPOW owns and operates fully automatic production lines, a full range of test equipment and an advanced MES that collectively address all aspects of its manufacturing process, from electronics, software design to module assembly, battery assembly as well as initial and final testing. ROYPOW focuses on the self-development of power electronics technologies, including PCS, BMS, and EMS as the core competence.

As a renewable energy innovator, ROYPOW is committed to the mission of achieving energy sustainability while creating a better life for human beings.

## R&D and Manufacturing Highlights

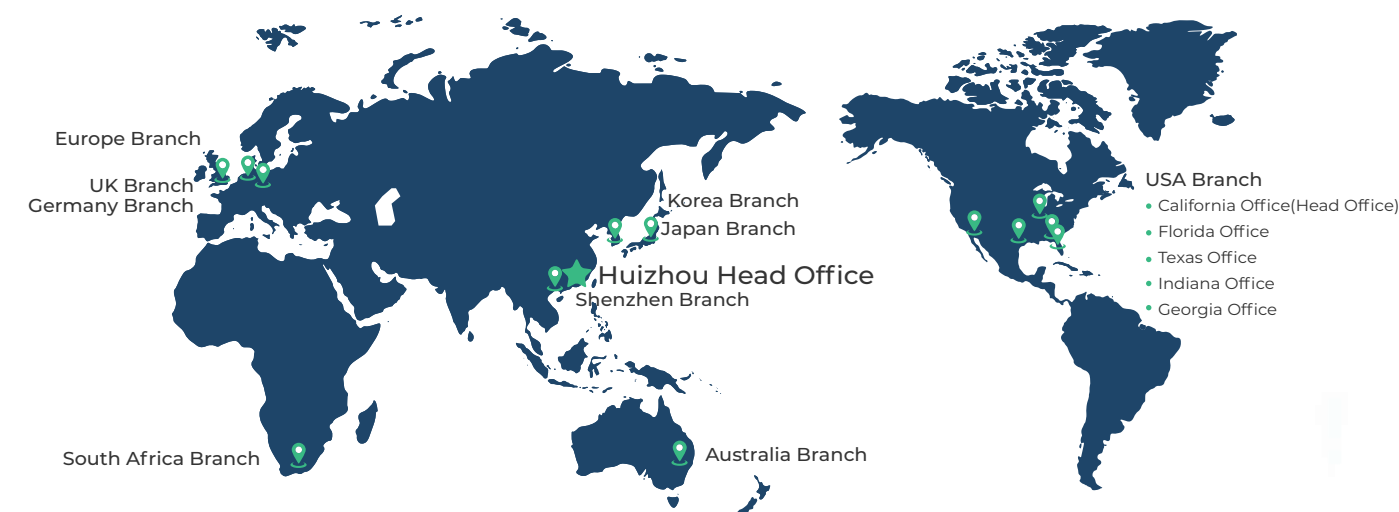
As a result of these investments, ROYPOW is capable of "end-to-end" integrated delivery making our products out-perform the industry norms.

- All-round testing.
- Integrated design.
- Advanced MES system.
- IATF 16949 automotive quality management system certification
- QC system.
- Persistent technology innovation.
- Fully automatic production line.
- ISO12405-2 vibration performance and safety testing of automotive lithium batteries

## Global Sales and Service Network System

- Timely Delivery.
- Hassle-free After-sales Service.
- Fast Response Technical Support.

ROYPOW has comprehensively unfolded its overseas market layout to ensure the localization of R&D, manufacturing, marketing and service, becoming one of your most reliable and valuable partners.



## Upgrading to New Technology, with Our Turnkey Solutions.

With years of dedication to new energy solutions, we are proud to offer customers professional solutions for:

- ✓ **Low-speed Vehicle Batteries** including golf carts and sightseeing cars;
- ✓ **Industrial Batteries** including forklifts, aerial work platforms and floor cleaning machines;
- ✓ **Vehicle-Mounted Energy Storage Systems & Batteries** including RV and truck energy storage and air conditioning systems, off-grid solar systems for RV, as well as power batteries for electric motorcycles;
- ✓ **Marine Energy Storage Systems & Batteries** including trolling motors, fish finders, other off-grid energy storage systems for marine, and marine power systems;
- ✓ **Residential Energy Storage Systems** including home storage as well as off-grid energy storage (for forest cabin, island homes without electricity, etc.);
- ✓ **Commercial & Industrial Energy Storage Systems** including diesel generator power micro-grid energy storage systems (for tower cranes, air compressors, mixers, crushers, etc);
- ✓ **Chargers** for forklifts, aerial work platforms, floor cleaning machines, golf carts and various marine batteries.

