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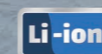
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Global Lithium+ Solution Provider

LiFePO₄ Batteries for Airport Ground Support Equipment (GSE)

Embrace of the future
of efficient ground handling



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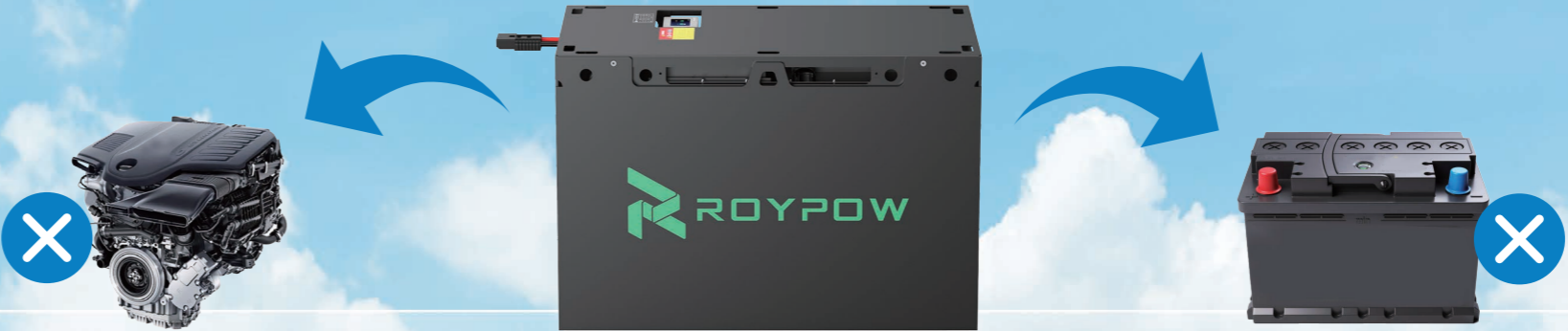


Switch From IC Engines and Lead Acid to ROYPOW Lithium for GSE

Ideal Power Solution for GSE Operations

Electric ground support equipment is the foundation of a functional airport. Serving in any weather condition for efficient ground handling from the tarmac to the terminal demands the reliability of the power source.

ROYPOW lithium iron phosphate technologies offer significant advantages compared to conventional GSE powered by Internal Combustion (IC) engines or lead acid, making them a worthwhile investment and a smart long-term solution.



- ✓ Meet the regulations for reduced carbon footprint
- ✓ Low engine noise on the ramp
- ✓ Fewer moving parts that require maintenance
- ✓ Reduced fuel consumption and costs
- ✓ Lower safety and health risks for ground personnel

Lower Total Cost of Ownership

Converting to lithium-powered GSE may require a higher initial investment, **but its ongoing savings can give you a more cost-effective bill.**

- ✓ One battery for multiple shifts
- ✓ Long service life without frequent battery swaps
- ✓ Eliminate battery maintenance labor cost
- ✓ Charge more quickly for maximized uptime and increased equipment availability
- ✓ Perform better in cooler and hotter environments
- ✓ Stable voltage at all levels of discharge
- ✓ No dangerous substances or spillage



Designed to Last, Engineered to Perform



Speed and efficiency are essential in ground support equipment to minimize the turnaround time. ROYPOW LiFePO₄ batteries, from internal to external, are manufactured to the highest standards of durability, reliability, and safety for the best on-time GSE operations.

Rugged & Automotive-Grade, Longer Lifespan as It Can Be



The LiFePO₄ GSE batteries are built with advanced steel casing and watertight enclosures to make them tough enough and up to the challenges of harsh working conditions such as vibrations, impacts, or water ingress experienced on airport ground handling.

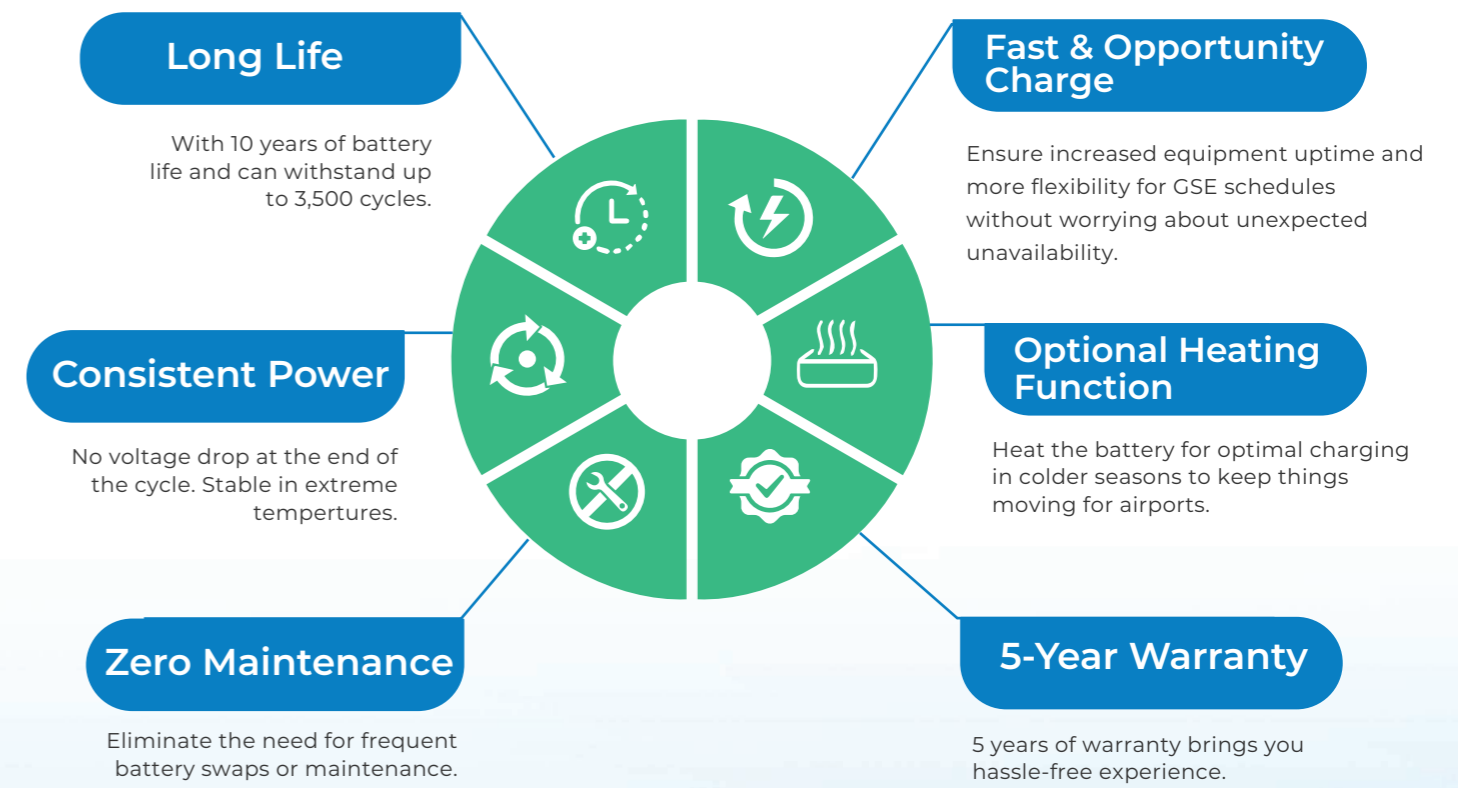
- ✓ **Vibration-Resistant**
- ✓ **Shock-Resistant**
- ✓ **IP65-Rated Protection**

Built-in Fire Extinguisher



Each battery is equipped with one or more specially designed fire extinguisher devices. Once the battery exceeds the temperature limit and has the potential to fire, the device will activate automatically for fire protection.

Fire-resistant materials adopted between battery modules double the guarantee for fire safety.



Compatible with Most GSE Applications

Battery Management System (BMS)

The built-in BMS is equipped with automotive-grade components assuring safety, top quality and high energy density to provide a fully optimized solution for demanding industrial applications.

BMS software ensures the battery provides peak performance when in operation, delivers longer run time between charges, maximizes the total battery lifespan and to communicate well between the charger, battery and users. (BMS programmable based on customer's tech protocol)

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 improving 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 the 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 the 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.



BMS



4G Module



Fast Charger
(IP54 Protection)

Intelligent, Safe & Reliable

Smart 4G Module

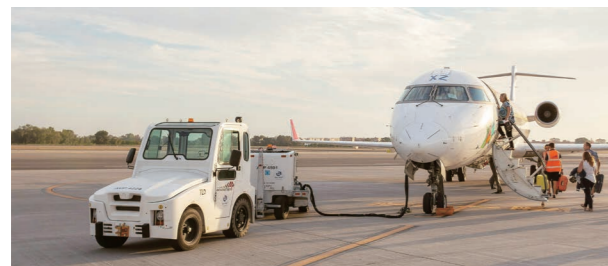
ROYPOW smart 4G module can realize remote monitoring in real time, even in different countries. If some faults occur, you can get an alarm in time. Once the faults can not be solved, you can get a remote diagnosis online from us to solve the problems as soon as possible.

- ✓ Remote Software Upgrades
- ✓ Easy Network Connection
- ✓ GPS Location
- ✓ More Customized Functions

Chargers for LiFePO₄ GSE Batteries

Charge with ROYPOW chargers to deliver a fast charging experience, keep the best communication between the batteries and chargers, and ensure optimal battery performance for extended battery life. (ROYPOW GSE batteries are compatible with Delta-Q and ZIVAN chargers.)

- ✓ Safe & Fast Charging
Charge safely and quickly for increased equipment availability between flights.
- ✓ Intelligent Protection
Built-in multiple charging protections and advanced technologies ensure reliable performance.
- ✓ Zero Maintenance
Highly waterproof and vibration-resistant design ensures stable charging and requires virtually no maintenance.



Standard and Customizable Battery Systems for GSE Applications



Specifications



Technical Specifications								Charge/Discharge Current			General	
Model	Nominal Voltage	Working Voltage Range	Rated Capacity	Rated Energy	Life Cycles	Dimensions (L*W*H)	Weight lbs. (kg)	Charge Current	Discharge Current	Maximum Discharge Current	Casing Material	IP Rating
48 V System												
F48280D-A	51.2 V	40~58.4 V	280 Ah	14.34 kWh	>3,500 Times	32.09 x 29.13 x 18.7 inch (815 x 740 x 475 mm)	1499.14±55.12 lbs. (680±25 kg)	145 A	350 A	700 A (30 S)	Steel	IP65
F48460K		41.6~58.4 V	460 Ah	23.55 kWh		32.68 x 24.8 x 24.69 inch (830 x 630 x 627 mm)	1884.95±110.23 lbs. (855±50 kg)	235 A	320 A	700 A (30 S)		IP65
80 V System												
F80560X	80 V	65~91.25 V	560 Ah	44.8 kWh	>3,500 Times	40.5 x 28 x 30.9 inch (1028 x 711 x 784 mm)	3434.8±110 lbs. (1,558±50 kg)	200 A	350 A	700 A (30 S)	Steel	IP65
F80608D	83.2 V	67.6~94.9 V	608 Ah	50.59 kWh		40.5 x 33.66 x 30.9 inch (1028 x 855 x 784 mm)	3,960±154 lbs (1,800±70 kg)	200 A	420 A	700 A (30 S)		IP65
F80690L	80 V	62.5~92.5 V	690 Ah	55.2 kWh		45.98 x 25.94 x 30.9 inch (1168 x 659 x 784 mm)	3,438±110 lbs. (1,560±50 kg)	280 A	420 A	700 A (30 S)		IP65
Working Temperature Range		Charge		Discharge		Storage (1 month)						
		-4°F~131°F (-20°C ~ 55°C)		-4°F~131°F (-20°C ~ 55°C)		-4°F~131°F (-20°C ~ 55°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.



ROYPOW, Your Trusted Partner

For One-stop 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

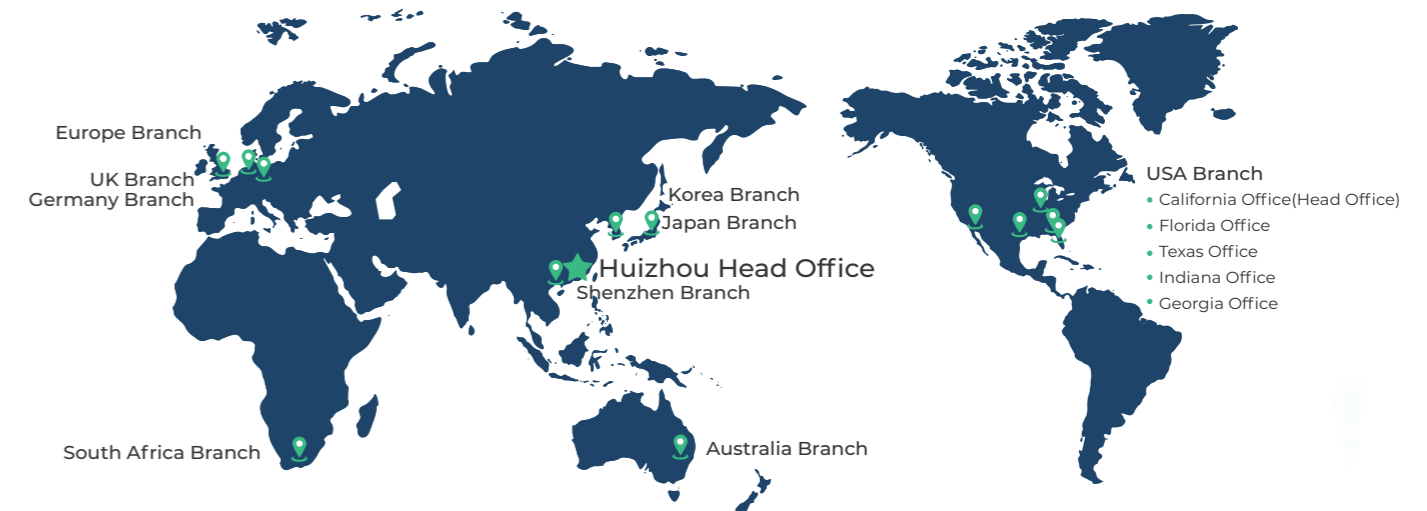
As a result of these investments, ROYPOW is capable of "end-to-end" integrated delivery making our products out-perform the industry norms.

- 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 and airport ground support equipment;
- ✓ **Residential Energy Storage Systems & Portable Power Units** including home storage and portable energy storage products, as well as off-grid energy storage (for forest cabin, island homes without electricity, etc.);
- ✓ **Marine Energy Storage Systems & Batteries** including trolling motors, fish finders, other off-grid energy storage systems for marine, and marine power systems;
- ✓ **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.

