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Version: December 16, 2024, LiFePO<sub>4</sub> Batteries for Airport Ground Support Equipment



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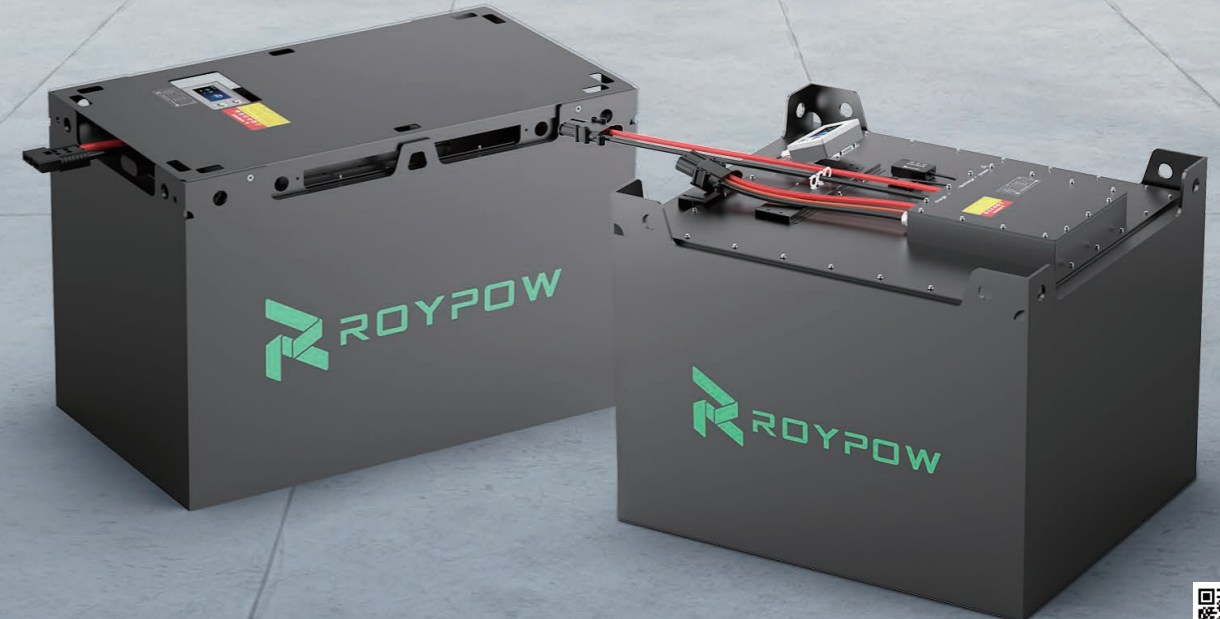
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Global Lithium+ Solution Provider

# LiFePO<sub>4</sub> Batteries for Airport Ground Support Equipment and Ground Power Units

Embrace of the future of efficient ground handling



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Scan It!

# ROYPOW

## For One-stop New Energy Solutions

- R&D, manufacturing and sales of motive power systems and energy storage systems as one-stop solutions
- Fully automatic production lines, a full range of test equipment and an advanced MES
- Covering Low-Speed Vehicles' Batteries, Industrial Batteries, as well as Residential ESS, Commercial & Industrial ESS, and Mobile ESS
- Self-development of power electronics technologies, including PCS, BMS, and EMS



**750+** Employees  
**190+** R&D People  
**105,000 m<sup>2</sup>** Headquarters Floor Area  
**2,500 m<sup>2</sup>** Testing Center  
**202** Patents

### Quality Control Certificates:

- ✓ Environmental Management System: ISO 14001:2015
- ✓ Occupational Health and Safety Management System: ISO 45001:2018
- ✓ Quality Management System: ISO 9001:2015, IATF16949:2016
- ✓ Information Security Management System: ISO/IEC 27001:2022
- ✓ Social Accountability Management System: SA8000:2014
- ✓ Hazardous Substance Process Management: IECQ QC 080000



### Product Certifications:

UL 1973, UL 9540A, UL 9540, UL 2580, UL 2271, UL 1741  
 IEC 62619  
 EN 62477, EN 62040, (EU) 2023/1542, EN 62109-1, EN 62109-2

**UL** **EMC** **FCC, IEC/EN 61000-6, BS EN IEC 61000-6**  
**GRID** **Functional Safety** **IEC 60730, ISO 13849-1**  
**CB** **Transport** **UN 38.3**  
**CE** **RoHS** **RoHS Directive 2011/65/EU & (EU) 2015/863**

### R&D and Manufacturing Highlights

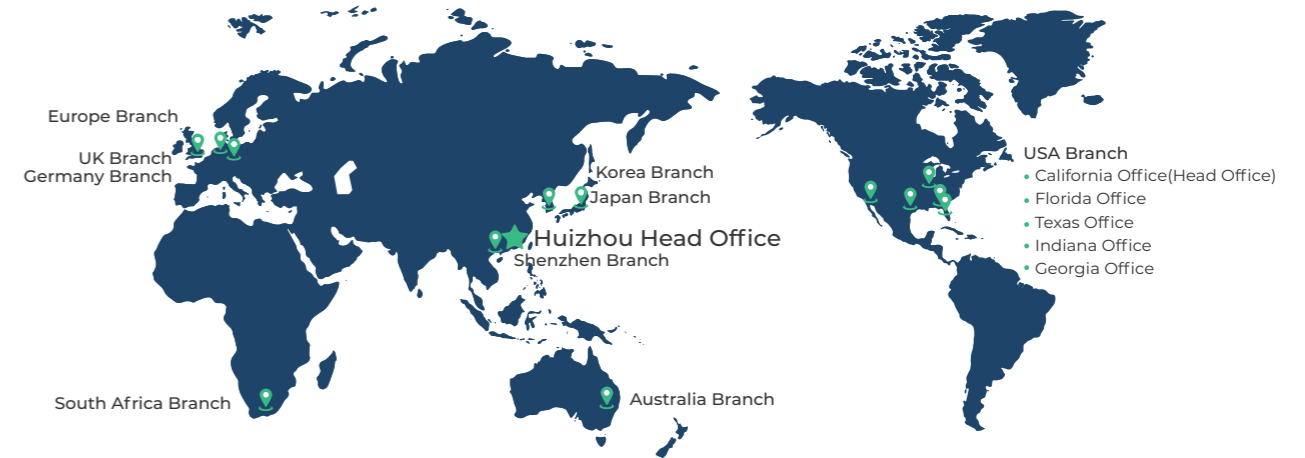
As a result of these investments, ROYPOW is capable of "end-to-end" integrated delivery, making our products out-perform the industry norms.

- Fully Automatic Production Lines
- BMS, PCS, EMS All Designed in House
- All-round Testing
- Advanced MES System

### Global Sales and Service Network

- 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
- Battery Systems for Off-highway Applications
- Residential Energy Storage Systems
- Mobile Energy Storage Systems
- Industrial Batteries
- Battery Systems for Emerging Applications
- Commercial & Industrial Energy Storage Systems
- Chargers



# 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 LiFePO<sub>4</sub> 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 LiFePO<sub>4</sub> 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.

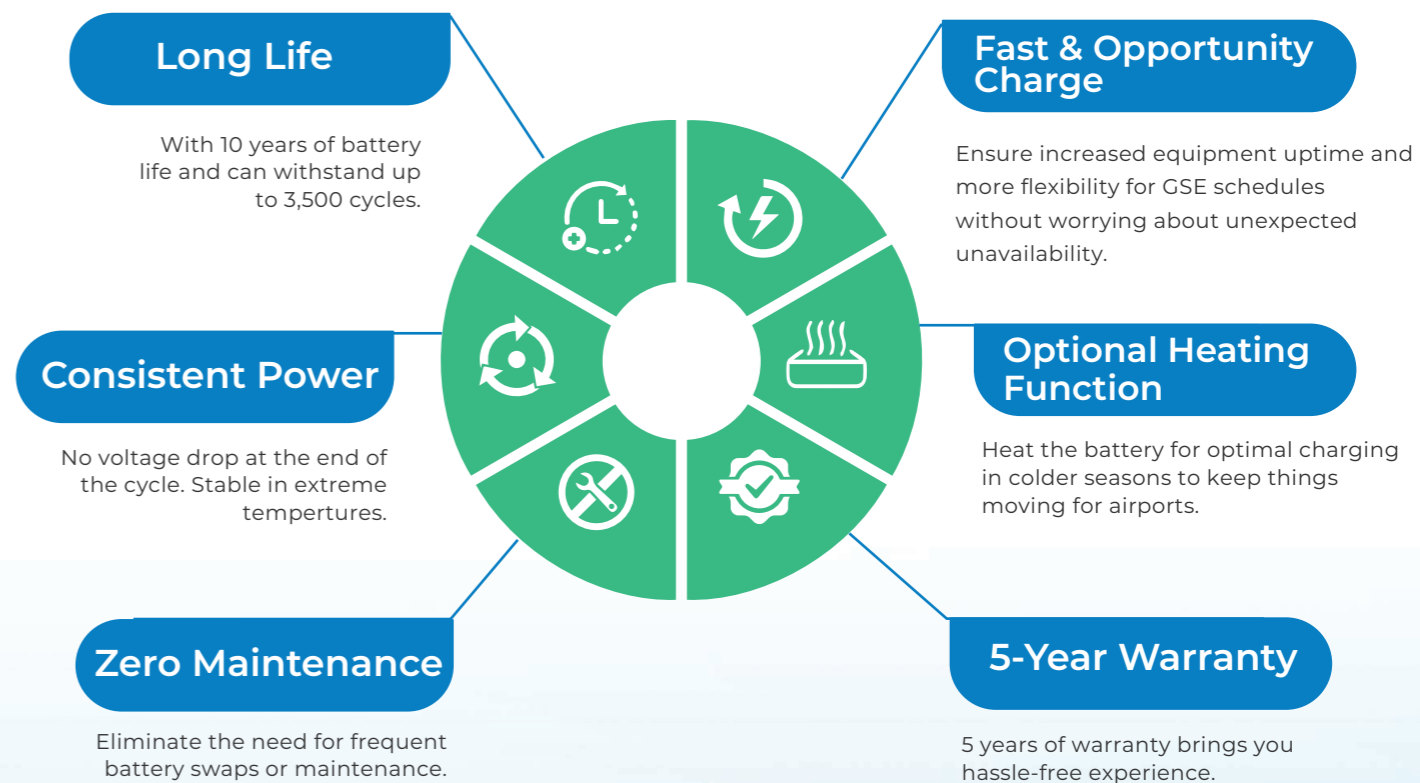
- ✓ Vibration-Resistant
- ✓ Shock-Resistant
- ✓ IP65-Rated Protection

## 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)

## Smart 4G Module

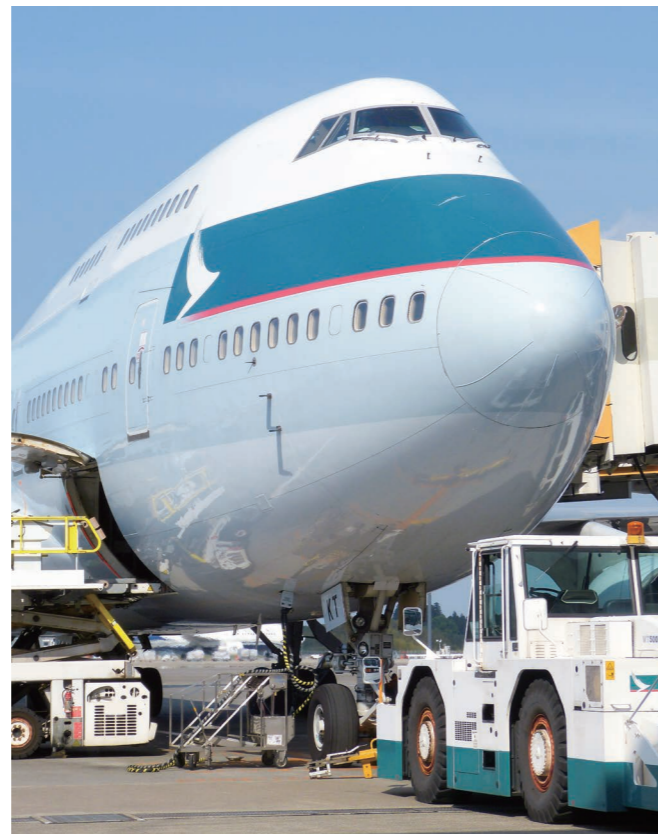
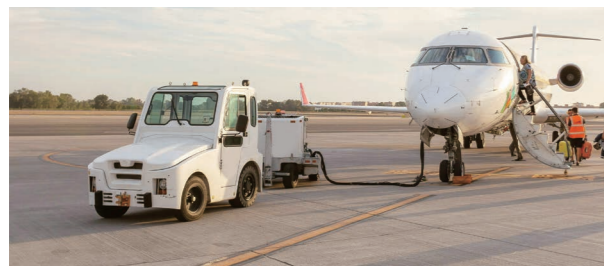
ROYPOW smart 4G module can realize remote monitoring in real time, even in different countries. If some faults occur, you can get an alarm in time. Once the faults can not be solved, you can get a remote diagnosis online from us to solve the problems as soon as possible.

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

## Chargers for LiFePO<sub>4</sub> 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

Model	Nominal Voltage	Working Voltage Range	Technical Specifications				Dimensions (L*W*H)	Weight lbs. (kg)	Charge/Discharge Current		General	
			Rated Capacity	Rated Energy	Life Cycles	Charge Current			Discharge Current	Casing Material	IP Rating	
<b>48 V System</b>												
TR48280D-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	Steel	IP65	
TR48460K		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		IP65	
<b>80 V System</b>												
TR80230	80 V	67.2 V-87.6 V	230 Ah	17.66 kWh	>3,500 Times	38.19 x 21.65 x 10.63 inch (970 x 550 x 270mm)	392.42 lbs. (178kg)	100 A	200 A	Steel	IP65	
TR80314		67.2 V-87.6 V	314 Ah	24.11 kWh		44.09 x 9.84 x 22.52 inch (1120 x 250 x 572mm)	546.75 lbs. (248kg)	100 A	200 A		IP65	
TR80460		67.2 V-87.6 V	460 Ah	35.32 kWh		38.19 x 21.65 x 22.44 inch (970 x 550 x 570mm)	749.57 lbs. (340kg)	200 A	350 A		IP65	
TR80628		67.2 V-87.6 V	628 Ah	48.23 kWh		44.09 x 17.32 x 22.52 inch (1120 x 440 x 572mm)	954.6 lbs. (433kg)	200 A	350 A		IP65	

<b>Working Temperature Range</b>	<b>Charge</b> -4°F~131°F ( -20°C ~ 55°C)	<b>Discharge</b> -4°F~131°F ( -20°C ~ 55°C)	<b>Storage ( 1 month )</b> -4°F~131°F ( -20°C ~ 55°C)
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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.

# 537V / 280Ah High-Voltage LiFePO<sub>4</sub> Batteries for Ground Power Units (GPU)



## Features



High-voltage system of up to 600V to support higher power loads.



Designed to handle high currents, delivering robust power output for demanding ground handling.



Compatible with ROYPOW charger for optimal performance and extended life.



Optional liquid-cooling function to optimize battery performance and battery lifetime.



Equipped with UL94 V-0-rated fire-retardant materials to offer advanced protection for enhanced safety.



Intelligent thermal runaway management with fire suppression and spread prevention to minimize the risk of fire hazards.

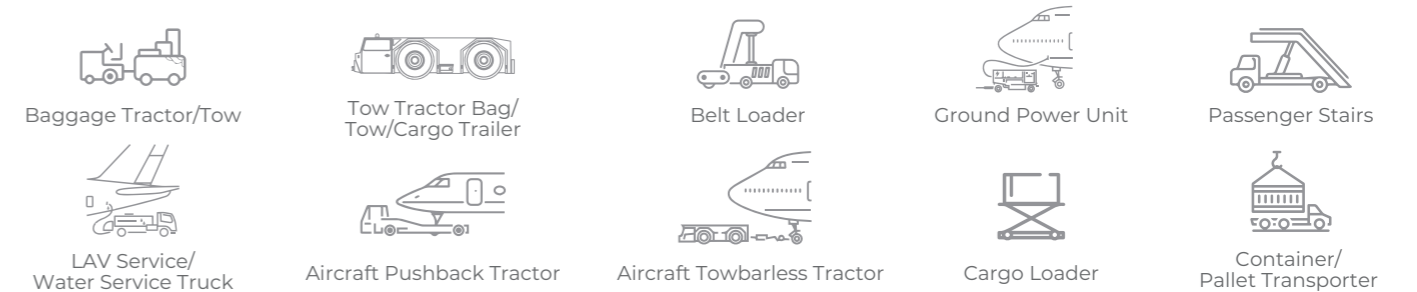
## Specifications

### High-voltage Solution

Single Battery Pack	1C-rate
Voltage / Capacity (Single Pack)	51.2 V / 304 Ah or 51.2 V / 280 Ah
System Voltage	256 - 870.4 V
System Capacity	32.7 - 2785.2 kWh
Continuous Charge / Discharge Current	Discharge / Charge: 0.35C / 100 A
Instantaneous Charge and Discharge Current	Discharge / Charge: 1C / 280 A, 30 s
Cooling Method	Air Cooled or Liquid Cooled
Certification	IEC62619, UN 38.3, R100
IP Rating	IP67

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## Applications:



# Onboard Chargers for 80V GSE Batteries

Maximize Uptime with Safe, Efficient Charging Solutions



## Features



### IP65 ingress rating

Safe in different environment/weather conditions



### Well-proven reliability

Robust and durable designs for the shell and active cooling fan



### Multiple Safety Protections

Protection against burnout, reverse connection of batteries, no load, and short circuit as well as automatic shutdown when fully charged



### Intelligent Control

Built-in Bluetooth with Apps control to configure parameters and charging curves easily

## Specifications

Model	WT8050
Phase	Three-phase Three-wire + PE Line
Rated Voltage for Battery Pack	80V
AC Input Voltage	Line Voltage 260~457VAC; 50Hz/60Hz
Max. Output Voltage	113V
AC Input Max. Current	9A@380VAC
Max. Output Current	50A
Protection Level	IP65
Dimension (L x W x H)	419 x 281.5 x 143 mm
Net Weight	18 kg

1. All pictures shown are for reference only and data are based on ROYPOW standard test procedures.  
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